C. C. TATHAM & ASSOCIATES LTD.
Collingwood Orillia Bracebridge Barrie

ATHERLEY-UPTERGROVE SECONDARY PLAN AREA/RAMA ROAD CORRIDOR MASTER SERVICING PLAN

PREPARED FOR:
TOWNSHIP OF RAMARA

PREPARED BY:
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INTRODUCTION

The Official Plan for the Township of Ramara (Township) allows for possible development within the Atherley/Uptergrove Secondary Plan Area and Rama Road Corridor. As a result the Township proceeded under the Class Environmental Assessment process to establish a Master Servicing Plan (MSP) for the area.

The purpose of the MSP is to "determine an environmentally sensitive and sustainable solution to providing services for development" by preparing a Master Servicing Plan for the Study Area, to address providing service to growth areas defined under the Official Plan and more specifically, what type of servicing is appropriate: private, communal, municipal or a combination.

The Master Servicing Plan is being conducted to follow the guidelines and requirements for the Municipal Class Environmental Assessment (Class EA) process as presented in the June 2000 document prepared by the Municipal Engineers Association. The Master Plan will complete Phases 1 and 2 of the Class EA process.

STUDY AREA

The Study Area is a large area that is defined by subwatershed limits of Lake Couchiching, Lake Simcoe, Mud Lake and Lake St. John as they apply to the settlement areas and the corridor. The area used in this Study is identified by property boundaries, lot and concession lines, and roads.

The total land area within the Study Area is approximately 1,773 hectares (4,381 acres).

Two parts of the Mnjikaning First Nations reserve are within the Study Area. This community is not under the jurisdiction of the Township of Ramara and is not part of this Study.

There are approximately 1,359 properties within the Study Area that are divided into the following categories:

Residential (occupied)	1,052	77%
Residential (vacant)	181	13%
Commercial	27	2%
Public and Institutional	24	2%
Agriculture and Vacant	75	6%

Approximately 31% of the Study Area or 324 dwellings are located in the Rama Road Corridor and approximately 69% or 728 dwellings are located in the Atherley-Uptergrove Settlement Area.

The 30 year growth projection estimates 2,822 new dwelling units in the Township. Assuming one-third to one-half of the new dwelling units (950-1400) are in the study area, less 300 units already approved in Uptergrove Estates (south west corner of study area), the estimated 30 year population growth will be 1625-2750 residents (650-1100 units).

EXISTING CONDITIONS

A complete inventory and assessment of natural heritage and environmental features was completed by Michalski Neilson Associates Limited and is included in the MSP.

Surface water runoff throughout the majority of the study area is captured and conveyed via open ditches, municipal drains, award drains and watercourses to Lake Simcoe, Lake Couchiching, Mud Lake and Lake St. John. Some storm sewer systems are also present in the built-up areas of Atherley and the Mnjikaning First Nations land.

All residential sewage disposal is via subsurface disposal, i.e. typical septic tank collection and tile field disposal. The majority of remaining land uses also utilize subsurface sewage effluent disposal, except for Fern Resort on Lake Couchiching which has a sewage treatment plant with tertiary treatment and direct discharge to the lake.

Similar to the existing sewage works, all existing development in the study area is provided potable water from individual supplies. The majority are from groundwater wells (dug or drilled) with some shoreline development obtaining water from Lakes Simcoe or Couchiching.

The existing transportation network within the study area is dominated by Highway 12 running east-west and County Road 44 (Rama Road) running north-south, both major 2-lanes roads generally bisecting the study area. These roads are under the jurisdiction of the Provincial and County governments, respectively. The remainder of the roads within the study area are under the control of the Township (except for roads within the First Nations lands).

ALTERNATIVE SOLUTIONS FOR SERVICING

Do Nothing

The option of the "Do Nothing" alternative would not address the problem statement, to provide appropriate servicing in sanitary, stormwater, water supply and transportation systems to meet the needs of the Study Areas projected population. This alternative would limit growth and the self sufficiency of the Township and is therefore not further considered.

Stormwater Management

Stormwater collection can be by open ditches or storm sewers.

The options for providing stormwater management (SWM) for new development include:

- Lot level controls
- Conveyance controls
- End of collection system controls

Sewage and Water Works

The options for providing sewage and water service within the study area include the following:

- individual private subsurface sewage disposal systems (with or without advanced treatment) and individual water supply from a drilled well;
- communal sewage facilities with subsurface disposal or direct discharge to surface water and communal well or surface water intake for water supply;
- full municipal system comprised of sewage collection, pumping, advanced treatment and effluent disposal by subsurface means, spray irrigation or direct discharge to surface water, and water supply systems utilizing surface water intake.

In addition to the above options there was also the consideration of obtaining service from an existing system such as those owned by the City of Orillia or Mnjikaning First Nations. This alternative was not considered viable from a financial perspective given the location of the growth areas and the distance to those systems. In addition, it is not believed those systems have additional spare capacity at this time.

EVALUATION OF ALTERNATIVES

Stormwater Management

Based on available background information the use of SWM controls promoting infiltration are generally not recommended for the Study Area due to the impervious soils and high water table. It should be noted that some limited areas exist with pervious soil and groundwater conditions that could support infiltration facilities. However end-of-pipe SWM facilities will likely be required due to the limited size of the porous soil areas, but additional study could be completed.

Sewage and Water Works

In each designated area the servicing options were evaluated based on a number of criteria:

- Natural Environment
  - Whether development will have a positive or negative effect on existing physical features – woodlands, wetlands, etc.
- Socio-economic
  - Change to tax base
  - Change to employment opportunities
  - Change to quality of life
  - Cost of service
- Public Health
  - Effects on ground and surface water quality
  - Effects on air pollutants
  - Effects existing sub-surface disposal systems
- Cost
  - Cost for implementation, phasing, financing, cost-sharing
  - Cost to construct sewage and water facilities
  - Cost to operate and maintain facilities

As a result of the evaluation, individual private servicing is the least preferred alternative.

Communal servicing appears to be acceptable from an environmental impact perspective provided strict design standards and municipal controls are put in place for each of the systems, including municipal responsibility for operations and maintenance.

Provision of full municipal services will likely result in too great an impact to the receiving lakes, subject to completion of the Provincial IGAP. In addition, implementation of this option is constrained due to high front end costs for new facilities.

PREFERRED SERVICING SOLUTIONS AND IMPLEMENTATION

The overall study area has been sub-divided into distinct service areas, based on land use and location where each is to be developed with a communal water and sewage system. Resort commercial service areas are designated D1 through D5, highway commercial areas are identified as C1 and C2 and residential development areas are designated as R1 through R4. These are preferred development areas based on the findings of the MSP. Development may be considered on other properties in the Study Area, if it proceeds in accordance with the MSP, i.e. communal servicing.

Stormwater Management

Centralized stormwater management (SWM) facilities have been identified for service areas C1, C2, and R1 through R4. The watershed characteristics in service areas D1 through D5 are highly variable – multiple road crossings, no distinct outlets, difficult topography, etc. which makes the implementation of centralized SWM facilities unfeasible. Stormwater management will be most appropriately dealt with as site specific development applications are processed.

Sewage and Water Works

The preferred solution for providing sewage treatment and disposal is communal treatment facilities with subsurface disposal or direct discharge to surface water as determined during Phase 3 of the Class EA process.

The preferred solution for potable water supply is communal systems from ground water or surface sources as determined during Phase 3 of the Class EA process.

Transportation

The recommended solution proposes new roadways to access the proposed service area:

- Collector road extended from Highway 12/Rama Road intersection south to service residential areas R2 & R3.
- Intersection on Rama Road to access commercial areas C1 & C2. No access or through traffic to adjacent residential areas.
- Collector road from the Balsam Road/Highway 12 intersection to service residential area R1, eventually extending to future residential area R4.
- New local roads in destination commercial areas D1-D5 to access Rama Road at locations determined on site specific basis.

Secondary Plans

Section 4.1.3.1 of the Ramara Official Plan sets out the policies for the preparation of Secondary Plans in the villages. Section 4.2.1 sets out the policies for the preparation of a Secondary Plan for the Rama Road Corridor.

Most of the background for these Secondary Plans is contained in the Master Servicing Plan. When the Master Servicing Plan is adopted by the Township, work will begin on the preparation of these Secondary Plans. The Secondary Plans will be subject to open houses and public meetings, consultation with land owners and residents, and will be adopted by the Township as amendments to the Ramara Official Plan.

Service Area and Land Owner's Groups

Each service area is comprised of a number of individual land parcels. It is anticipated that the owners of these land parcels in each service area will create a "land owner's group" to share in the costs of the subsequent planning, design and construction of the communal water and sewage systems and any other works (stormwater management, traffic, parks, etc.) providing service to multiple properties within the service area.

The land owner's group will retain, as required, a lead consultant and/or trustee to develop an appropriate cost sharing agreement including provisions for "front ending" when individual land owners are not prepared to participate in the group from the outset. The municipality will not be a party to the cost sharing agreement.

The municipality will ensure that conditions of approval are imposed on development applications within each service area that obliges each land owner to join the land owner's group and participate in cost sharing of common services agreement.

Public and Agency Comments

Comments were requested from residents, public agencies and identified stakeholders in the Notice of Commencement and at the Public Information Centre. All comments received were addressed in the MSP.

Municipal Class Environmental Assessment

The completion of the Master Servicing Plan will satisfy Phase 1 and 2 of the Municipal Class EA. Phases 3 to 5 will be the responsibility of the land owner's group for each service area.

Phase 3 of the Municipal Class EA requires the complete assessment of design alternatives for the water and sewer systems to provide service to each service area. This assessment shall include consideration of all available design alternatives and shall include all necessary environmental, geotechnical, hydrogeological and financial analysis to verify the preferred design alternative is appropriate.

The financial analysis shall verify the proposed sewage and water systems can be owned and operated by the municipality in a cost effective manner with due consideration to the applicable legislation and the need for sustainability.

Comments on the Master Plan and Notice of Completion

This Master Servicing Plan will be filed with the Township of Ramara and placed on public record for a period of 30 days following publication of a Notice of Completion in the Orillia Packet & Times. In accordance with the notice, the public and review agencies will be invited to further review the report and provide written comments.

If concerns arise regarding this study, which cannot be resolved in discussion with the Township or the Project Team, the public can 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 Part II Order), which addresses individual environmental assessments. Requests are to be submitted to the Minister, and copied to the Township before the end of the 30 day review period. The Minister determines whether or not a Part II Order is appropriate and the Minister's decision becomes final.

If there is no request for a Part II Order within the 30 day period, the Township may proceed to implement the projects identified in the Master Servicing Plan.

Approvals and Implementation

In developing alternative design concepts for all preferred servicing solutions the following general requirements are to be recognized:

- The land owners group for each service area will be responsible for completion of the Class EA process as applicable (Phases 3 and 4 and all necessary final design approvals and construction.)
- All facilities must conform to municipal standards, Conservation Authority, MTO and MOE design guidelines.
- Development is permitted to proceed on individual parcels provided the infrastructure is planned for the service area. The approved design may include phasing of the major works.
- For communal systems servicing more than one land parcel, the municipality will assume ownership and become the operating authority of the stormwater management, sewage and water works at the time they go into service.
- The municipality may require financial securities for the works to ensure their completion and continued satisfactory operation.
- The financial analysis for the communal systems shall derive an appropriate rate to be charged for sewage and water service.
- The land owners group will be responsible for shortfalls in operating revenue during the initial years of operation when occupancy is insufficient and revenue is insufficient to offset the operating costs.
- The possibility of providing service to existing developed areas shall be incorporated into the design concepts where appropriate and as required by the municipality.
- The minimum size of development to be served by a single water or sewage system is 200 residential lots, or the equivalent design flow in the case of commercial properties.
- All communal stormwater management, sewage and water facilities serving more than one land parcel are to be located in separate blocks dedicated to the municipality under the appropriate planning process.

1.0 INTRODUCTION

1.1 BACKGROUND AND STUDY OBJECTIVES

The Official Plan for the Township of Ramara (Township) allows for possible development within the Atherley/Uptergrove Secondary Plan Area and Rama Road Corridor. As a result the Township proceeded under the Class Environmental Assessment process to establish a Master Servicing Plan (MSP) for the area.

The MSP was undertaken by a study team consisting of:

- **C.C. Tatham & Associates Ltd.**; Prime Consultant responsible for study team co-ordination, the overall Class EA process and developing/evaluating servicing options.
- **Mark L. Dorfman Planner Inc.**; As the Township's planning consultant Mark Dorfman provided input throughout the study with respect to municipal planning matters and assisted with public and agency consultation.
- **Michalski Nielsen Associates Limited**; Michael Michalski is a specialist environmental consultant and was responsible for the various biophysical, water quality and environmental evaluations throughout the study.
- **Golder Associates Ltd.**; John Easton of Golder Associates Ltd. provided input on hydrogeological matters such as the availability of groundwater for water supply and the potential impact to groundwater as a result of land-based effluent disposal systems.

A Notice of Commencement of the MSP was published in the Orillia Packet & Times newspaper on June 18, 2005 and was also mailed to all residents in the Study Area (as determined from the Township assessment roll), public agencies and additional identified stakeholders. A copy of the notice and list of respondents is included in Appendix A.

A Public Information Centre (PIC) was held on April 12, 2006 at the Ramara Centre. A notice of the meeting was published in the Orillia Packet & Times newspaper on April 1, 2006 and April 8, 2006 and was mailed to public agencies, identified stakeholders and respondents to the Notice of Commencement. Comment sheets and copies of the study information were provided at the PIC. A copy of the notice and comments received are included in Appendix B.

1.2 PROBLEM STATEMENT

The purpose of the study is to "determine an environmentally sensitive and sustainable solution to providing services for development" by preparing a Master Servicing Plan for the Study Area, to address providing service to growth areas defined under the Official Plan and more specifically, what type of servicing is appropriate: private, communal, municipal or a combination.

1.3 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

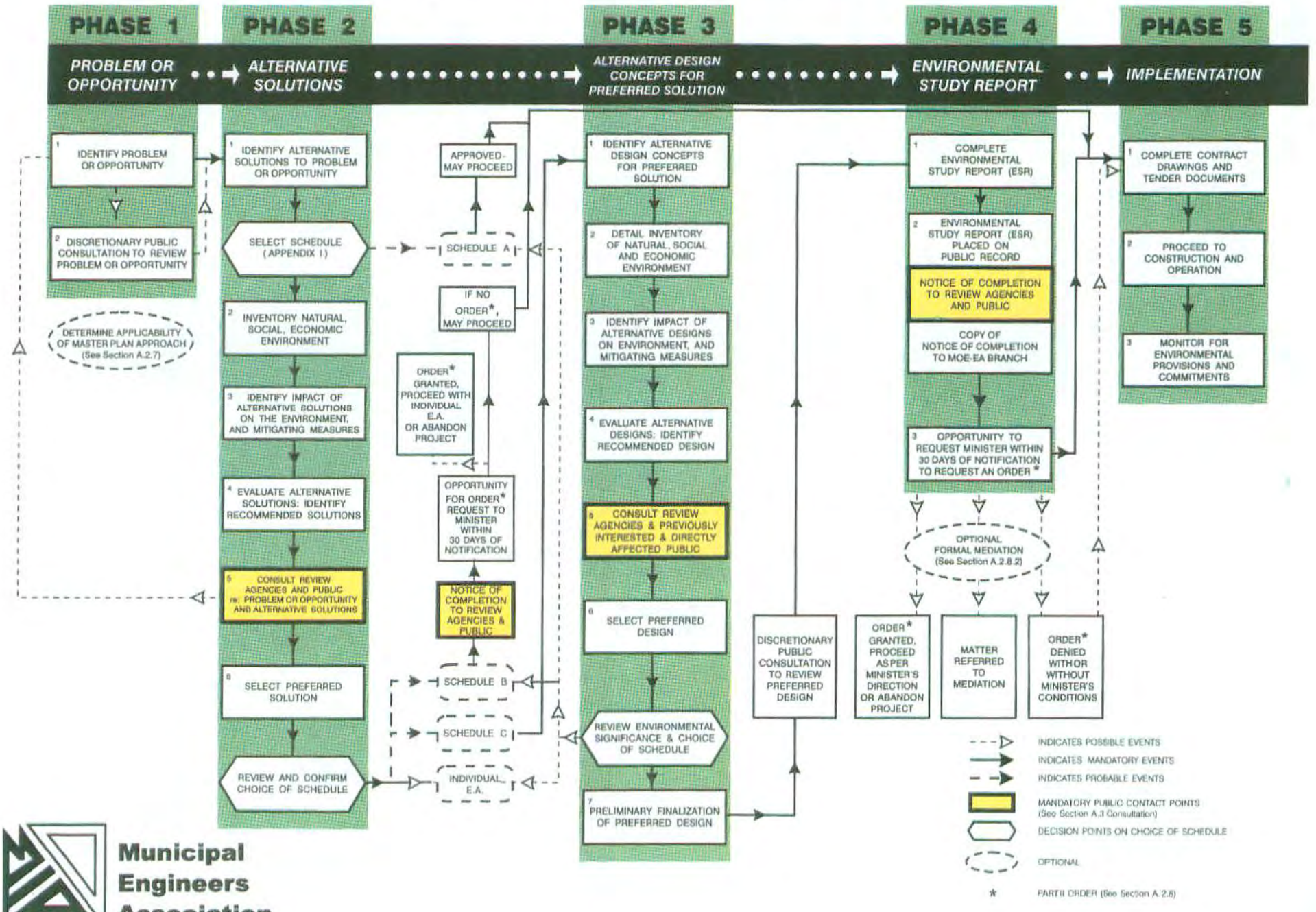
The Master Servicing Plan is being conducted to follow the guidelines and requirements for the Municipal Class Environmental Assessment (Class EA) process as presented in the June 2000 document prepared by the Municipal Engineers Association.

The planning and design process for a Class EA project is presented in the generic flowchart (Exhibit A.2) from the Class EA document, included overleaf as Figure 1.1.

The Master Plan will complete Phases 1 and 2 of the Class EA 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



Municipal Engineers Association

As presented in the Class EA document, "the key features of a Master Plan include:

- Addresses the key principles of successful environmental planning
- Addresses at least the first two phases of the Municipal Class EA and can also cover other phases
- Allows for an integrated process with other planning initiatives
- Is generally long term
- Takes a system wide approach to planning which relates infrastructure either geographically or by a particular function
- Recommends an infrastructure master plan which relates infrastructure either geographically or by a particular function
- Recommends an infrastructure master plan which can be implemented through the implementation of separate projects
- Includes a description of the specific projects."

And further:
"The work undertaken in the preparation of Master Plans should recognize the Planning and Design Process of this Class EA, and should incorporate the key principles of successful environmental assessment planning. It is imperative that public and agency consultation take place during each phase of the study process, specifically, at the initiation of the Master Plan study so that the scope and purpose of the study is understood, and at the selection of the preferred set if alternatives. At a minimum, the Master Planning process should address the first two phases in the Planning and Design Process of the Class EA."

2.0 STUDY AREA

The Study Area establishes the geographic area that is the basis for the Master Servicing Plan and the secondary plans.

The Study Area is a large area that is defined by subwatershed limits of Lake Couchiching, Lake Simcoe, Mud Lake and Lake St. John as they apply to the settlement areas and the corridor. The area used in this Study is identified by property boundaries, lot and concession lines, and roads.

Map 1 identifies the Study Area divided into two parts: Rama Road Corridor and the Atherley-Uptergrove Settlement Area.

The total land area within the Study Area is approximately 1,773 hectares (4,381 acres). The approximate areas in each subwatershed are:

Lake Couchiching	824.5 ha (2,062 ac.)
Lake Simcoe	779.5 ha (1,926 ac.)
Mud Lake	123.5 ha (505 ac.)
Lake St. John	35.5 ha (88 ac.)

Each component of the Study Area is generally described as:

Atherley-Uptergrove Settlement Area

North:	Concession Road 12
West:	Lake Simcoe and Lake Couchiching shorelines
East:	Line between west-half and east-half of Lot 25, Concession 11 Line between Lots 22 and 23, Concession 10.
South:	Concession Road 10 and Lake Simcoe shoreline

Rama Road Corridor

North:	Line between Broken Front Concessions 20 and 21
West:	Rama Road north of Longford Mills Road and Lake Couchiching shoreline
East:	Existing and former railway right-of-way north of Concession Road 2
	Line between Lots 23 and 24 in Concession 1
	Line between Lots 22 and 23 in north-half of Concession 13
	Line between Lots 24 and 25 in south-half of Concession 13
	Sideroad 25 north of Concession Road 12
South:	Concession Road 12

2.1 EXISTING LAND USE

Map 2 identifies the general land use within the Study Area. There are five categories of existing land use shown on this map:

Residential Cluster
These are the clusters of existing dwelling units and vacant residential lots. Included in these groupings are dwellings that are occupied full time by residents and dwellings that are seasonally occupied. The vacant lots are registered lots.

Commercial
These are properties that are used for commercial development such as retail, food and beverages establishments, accommodation, marina, and communication buildings and structures. Vacant commercial lots are included.

Public and Institutional
These are properties that include the Township's services such as parks, fire station, community centre; the provincial park; religious buildings and cemeteries.

Agriculture and Vacant
These are areas beyond the other three categories that include agricultural lands, vacant lots, non-farm residential dwellings and lots. These are typically larger parcels.

Mnjikaning First Nation Reserve

Two parts of the reserve are within the Study Area. This community is under a jurisdiction separate from the Township of Ramara and is not part of this Study.

There are approximately 1,359 properties within the Study Area that are divided into the following categories:

Residential (occupied)	1,052	77%
Residential (vacant)	181	13%
Commercial	27	2%
Public and Institutional	24	2%
Agriculture and Vacant	75	6%

2.2 EXISTING POPULATION

There are approximately 1,052 dwellings that are occupied in Ramara. According to the 2001 Census of Canada, there are an estimated 2.52 persons per occupied dwelling in the Study Area.

For purposes of this study, the estimated population is 2.651 persons. This population in the Study Area is 31% of the total population of the Township. Approximately 31% of the total occupied private dwellings in the Township are located in this Study Area.

Approximately 31% of the Study Area or 324 dwellings are located in the Rama Road Corridor and approximately 69% or 728 dwellings are located in the Atherley-Uptergrove Settlement Area.

2.3 CULTURAL FACILITIES

The following community, cultural and religious institutions and facilities are located in the Study Area.

Uptergrove Public School
Ramara Community Centre
Mara Provincial Park
Atherley Fire Station
Atherley Park and Beach
Longford Mills Community Centre
United Church
Seventh Day Adventist Church
Presbyterian Church
Roman Catholic Church
Anglican Church Cemetery
United Church Cemetery
Longford Union Protestant Cemetery

2.4 RAMARA OFFICIAL PLAN

On Schedule "A" - Land Use Plan within the Ramara Official Plan, the Atherley-Uptergrove Settlement Area is mainly designated as "Village." The remainder is designated "Rural", "Natural Area Protection", "Shoreline Residential" and "Agriculture".

In the Rama Road Corridor, the current designations are "Destination Commercial", "Rural", "Natural Area protection", "Shoreline Residential" and "Village".

Map 3 is an extract from Schedule "A".

The "Village" designation provides a full range of residential, commercial, industrial and institutional uses.

The "Destination Commercial" designation provides for a range of resorts, entertainment, accommodation, recreation, commercial recreation, and provision for resort-related residential.

The "Rural" designation consists of non-prime agricultural areas and may be considered for future development in the village, when designated for a village land use.

The "Natural Area Protection" designation includes significant natural area features and functions that are to be protected and conserved. Within this Study Area, these features are wetlands and woodlands.

The "Agriculture" designation includes prime agricultural areas as part of the larger agricultural area of the Township. If these lands are planned for future development, then justification is needed to be provided through the secondary planning process.

Map 4 is the Interim Secondary Plan for the Atherley-Uptergrove Village. This is the land use plan for the Village until a new secondary plan is adopted by the Township and incorporated into the Ramara Official Plan. The interim lands uses are "Village Residential", "Village Commercial", "Agriculture" and "Rural". This secondary planning process must rationalize the expansion of the designated Village boundary to include current "Agriculture" and "Rural" designations as part of the Village as shown on Map 4.

There is no interim secondary plan for the Rama Road Corridor. A separate secondary planning process is required for the Rama Road Corridor and the Longford Mills Settlement Area.

2.5 NATURAL HERITAGE FEATURES

Following are general descriptions of the natural heritage features of the Study Area, from a planning perspective. A complete inventory and assessment of natural heritage and environmental features was completed by Michalski Neilson Associates Limited (Michalski) and is included as Appendix C to this report.

2.5.1 Wetlands

Map 5 illustrates the natural heritage wetland features. There are two levels of wetland significance.

> The **Provincially Significant Wetlands** are to be protected from development. There is no development or site alteration allowed within these designated areas. In the **local wetlands**, development and site alteration may be permitted.

Within the Study Area, the following Provincially Significant Wetlands are wholly or partly located:

> Sucker Creek
> Atherley
> McPhee Bay
> Mud Lake

If there is development proposed within 120 metres of the Provincially Significant Wetlands, it shall be subject to an environmental impact statement on features and functions and mitigation measures.

2.5.2 Woodlands

Map 6 illustrates the natural heritage woodland features. There are two levels of woodland significance.

> The **Significant Woodlands** that are associated with Provincially Significant Wetlands are significant because of their functional relationship. There is no development or site alteration in these areas.
>
> The **other significant woodlands** may be developed or altered subject to an environmental impact statement that demonstrates that there will be no negative impact on the features and functions of the area.

If there is development proposed within 120 metres of the woodland/wetlands and within 50 metres of the significant woodlands, it shall be subject to an environmental impact statement to establish impact statement to establish impacts on features and functions and mitigation measures.

2.5.3 Supportive Corridor

On **Map 5**, a supportive corridor along an existing watercourse links two provincially significant wetlands. This channel is part of the Natural Area Framework. In any development proposal, the intent is to protect the function of this corridor.

2.6 SUBDRAINAGE AREAS

Map 7 illustrates all or parts of 18 subdrainage areas within the Study Area and how the significant wetlands and significant woodlands relate to these surface drainage areas. These subdrainage areas are discussed in more detail in Section 3.1.1 of this report.

This information generalizes the topographic features within the Study Area and establishes the natural area constraints to development.
This map information forms the basis for the discussion of the potential servicing and stormwater

management components presented in following sections of the MSP.

In the Study Area, there are eleven drumlins that characterize the landscape. These drumlins are part of a larger drumlin till plain within the Simcoe Lowlands Physiographic Region. These drumlins generally range from 5 to 10 metres in height and are relatively narrow in width. The drumlins are oriented in a north-west to south-east direction that represents the advancing glacier ice sheets more than 10,000 years ago.

2.7 SOILS

Map 8 illustrates the soil types and drainage characteristics of the soils.

Generally the topography of the Study Area is level with minor undulations. The lowest elevations are along the shorelines of Lakes Couchiching and Lake Simcoe. The highest elevation in the Study Area is north-west of the intersection of Sideroad 25 and Concession Road 12, where a telecommunications tower is located.

The soils with **good surface drainage** are on the drumlins and in the central and eastern part of the Atherley-Uptergrove Settlement Area and in the central part of the corridor and along the eastern flankage. This indicates that the soils within a metre of the surface can absorb surface water for most of the year. The following soil series are characterized with good drainage.

Otonabee Loam (Ol)
Otonabee Sandy Loam (Osl)
Wendigo Sandy Loam (Wes)
Vasey Loam (Vl)
Vasey sandy Loam (Vs)

The area of **poor surface drainage** cannot absorb surface water for most of the year within a metre of the surface. Typically, the upper aquifer groundwater remains close to the surface. The following soil series are characterized with poor drainage.

Atherley Clay Loam (Aycl)
Kenabeek Sandy Loam (Ks)
Muck (M)

The **imperfectly drained soils** tend to be located in areas of lower elevation between the drumlins and along the Rama Road Corridor. These soils indicate that surface water remains in the upper metre for long periods during the year. The following soil series is characterized with imperfect drainage.

Lovering Clay Loam (Lcl)

Further descriptions of the soils within the Study Area are included in the Michalski report (Appendix C) and Section 2.8 of this report.

2.8 PHYSICAL SETTING

2.8.1 Physiography and Drainage

The entire Study Area is within the Simcoe Lowlands Physiographic Region of Chapman and Putnam (1984). Ramara Township has been all but swept clean of overburden with exposed bedrock very common in the east and north of the Township. The overburden thickens toward the west along the margins of Lakes Simcoe and Couchiching south of Longford Mills. The land is drained by small streams that occupy lowland areas between drumlins. Most of the Study Area drains toward Lake Simcoe and Couchiching, however small portions of the eastern part of the Study Area drain toward Mud Lake and Lake St. John.

2.8.2 Geology

The bedrock at the surface in the Rama Road Corridor are Paleozoic sedimentary rocks of the Simcoe Group. Dolostone of the Bobcaygeon Formation is the youngest of these rocks and is exposed near Longford Mills. The next older rocks are limestones of the Gull River Formation. These rocks are up to 15 m thick. Underlying the Gull River Formation are sandstones and shales of the Shadow Lake Formation. These rocks are up to 10 m thick and overlie crystalline Precambrian rocks of the Central Gneiss Belt, which are among the youngest rocks of the Canadian Shield. The thickness of Paleozoic rocks is up to approximately 30 m in the Study Area, while Precambrian rocks are exposed at the surface on the east side of Lake St John. There is a time gap of approximately 500 million years between the Shadow Lake Formation and the gneisses of the Canadian Shield.

The bedrock is mantled by up to 25 m of unconsolidated overburden. The thickest areas of overburden are beneath northeast to southwest trending drumlins that are generally found in areas of Till (Figure 2.8-1). The topography is generally subdued throughout Ramara Township with the maximum elevation within the Study Area of approximately 240 masl on drumlins in the southern part of the area and minimum elevations of 218 masl along the shoreline of Lakes Simcoe and Couchiching. The bedrock surface ranges from 203 to 236 masl (Figures 2.8-2 and 2.8-3).

2.8.3 Hydrogeology

Groundwater supplies in the area are supported by infiltration of precipitation and flow of water through bedrock and overburden aquifers from upgradient lands to the east. The precipitation in this area is approximately 1,073 mm/year of which an equivalent of 261 mm falls as snow. The moisture surplus for the area assuming silty soils is 470 mm/year. The moisture surplus is the water available for maintaining surface water flow as well as replenishing groundwater resources. The range of the rate of recharge for silty soils in the Study Area is approximately 165 to 259 mm/year or 4.5 to 7.1m^3/day/Ha. This incident recharge is available for all aquifers and the primary recipient is the upper or water table aquifer. Deeper aquifers will receive a portion of this recharge and with the predominantly fine grained confining layers the recharge rate to the main water supply aquifers in the area is estimated to be 50 mm/year or 1.4 m^3/day/Ha.

The hydrogeological character of the area changes from the inland to shoreline areas across the Study Area. Two profiles (Figures 2.8-2 and 2.8-3) are typical of the general character of the Study Area. Figure 2.8-2 shows a profile of water well records from west to east along the Lake Simcoe shoreline of Concession 12 / Orkney Beach Road. The bedrock in this area has a range in elevation from 205 to 215 masl and is covered by up to 25 m of overburden. The overburden is primarily composed of lacustrine silt and clay and till. There is also a confined overburden aquifer over much of the area. Of the wells shown on this profile 40% are constructed in the bedrock aquifer while the remainder are constructed in the overburden.

Figure 2.8-3 shows a profile along Monk Road from the west to the east and indicates overburdened aquifers are absent in the inland area and are present only near the shoreline. The bedrock surface rises steadily from 210 masl in the west to 228 masl in the east. On this profile 96% of the wells are constructed in the bedrock aquifer, which is typical of water supplies in the majority of Ramara Township.

2.8.4 Groundwater Flow

Groundwater moves through fractures in the rock and spaces between soil grains due to the force of gravity. The direction of the movement of water can be determined by plotting the water levels from the Ontario Water Well Database on a map and contouring the resulting water level elevations (Figure 2.8-4). Not surprisingly water flows from areas of high topographic elevation in the east toward Lakes Simcoe, Couchiching and St John in the west. Streams also allow groundwater to discharge to the surface, which also depresses the groundwater table locally. The groundwater flow through the aquifers can be estimated using the Darcy Equation, which takes into account the slope of the water table (hydraulic

PLOT DATE: June 28, 2006
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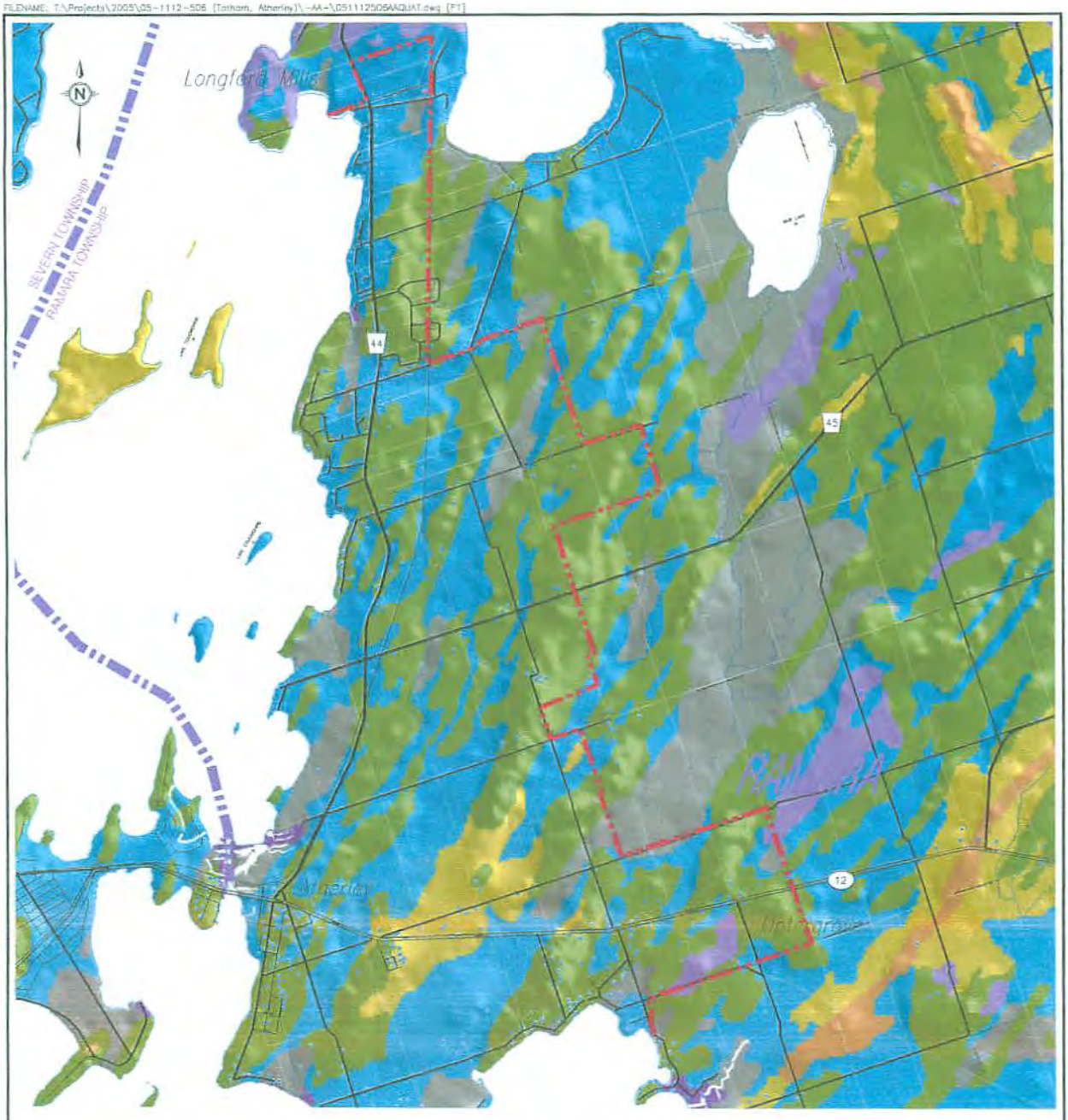


21 Man-made Deposits
20 Organic deposits: peat, muck, marl
19 Modern alluvial deposits: clay, silt, sand, gravel
18 Colluvial deposits: Colluvial deposits: boulders, scree, talus
17 Eolian deposits: fine to very fine sand and silt (loess)
14 Coarse-textured lacustrine deposits: sand, gravel, minor silt and clay
- 14a Deltaic deposits
- 14b Littoral deposits
- 14c Foreshore and basinal deposits

13 Fine-textured lacustrine deposits: silt and clay, minor sand and gravel
12 Older alluvial deposits: clay, silt, sand, gravel, may contain organic remains
9 Coarse-textured glaciolacustrine deposits: sand, gravel, minor silt and clay
- 9a Deltaic deposits
- 9b Littoral deposits
- 9c Foreshore and basinal deposits

8 Fine-textured glaciolacustrine deposits: silt and clay, minor sand and gravel
- 8a Massive to well laminated
- 8b Interbedded silt and clay and gritty, pebbly flow till and rainout deposits

7 Glaciofluvial deposits: braided river deposits and delta topset facies
- 7a Sandy deposits
- 7b Gravelly deposits

6 Ice-contact stratified deposits: sand and gravel, minor silt, clay and till
- 6a In moraines, eskers, kames and crevasse fills
- 6b In subaqueous fans

5 Till:
- 5a Silty sand to sand-textured till on Precambrian terrain
- 5b Stone-poor, sandy silt to silty sand-textured till on Paleozoic terrain
- 5c Stony, sandy silt to silty sand-textured till on Paleozoic terrain
- 5d Clay to silt-textured till (derived from glaciolacustrine deposits or shale)
- 5e Undifferentiated older tills, may include stratified deposits

4 Bedrock-drift complex in Paleozoic terrane:
- 4a Primarily till cover
- 4b Primarily stratified drift cover

3 Paleozoic bedrock
2 Precambrian bedrock-drift complex
- 2a Primarily till cover
- 2b Primarily stratified drift cover

1 Precambrian bedrock

Study Boundary
Municipal Boundary

metres
0 250 500 1000 2500

SCALE 1:40000

File referenced to UTM NAD 83 Zone 17

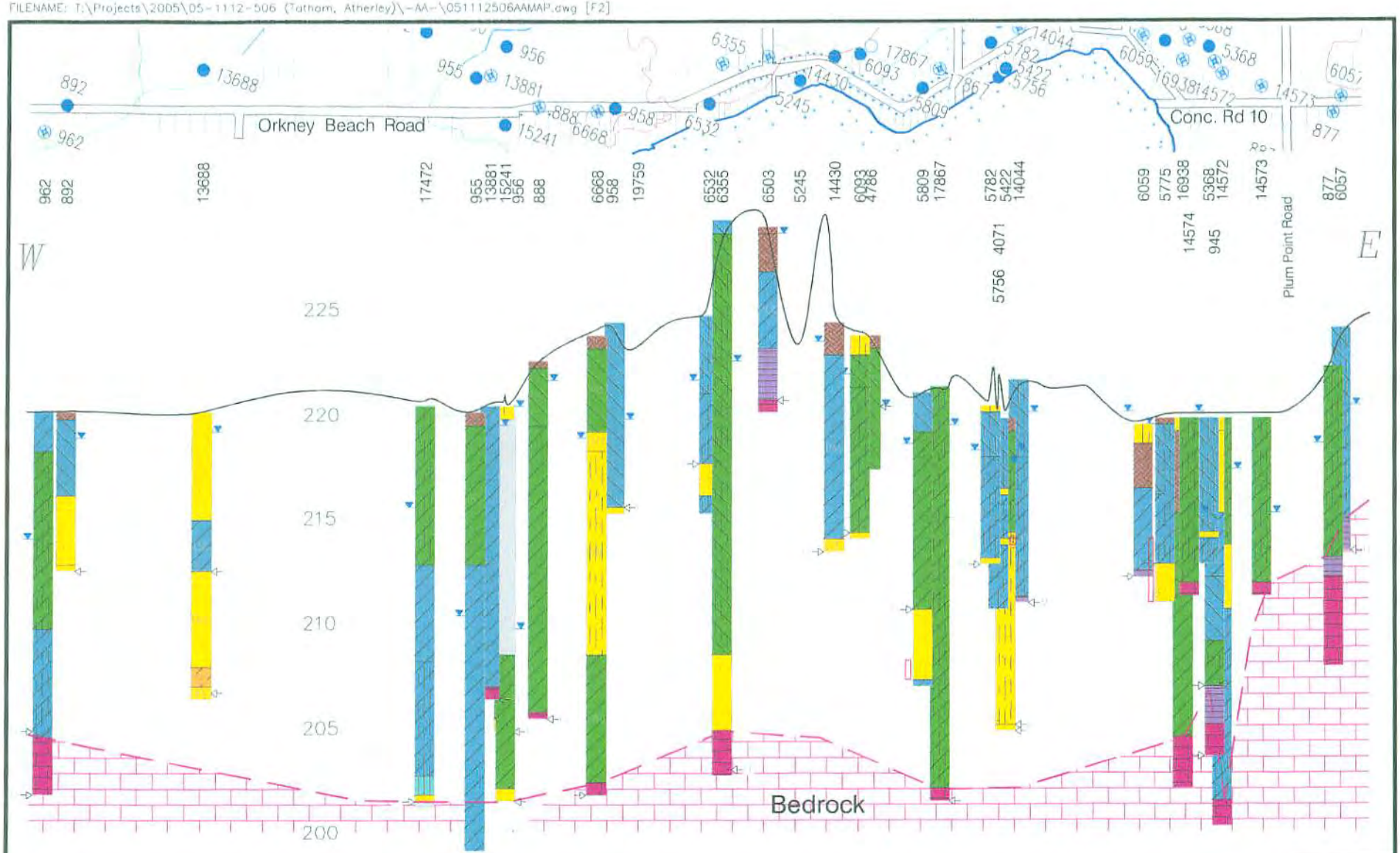
QUATERNARY MAP

TOWNSHIP OF RAMARA

Golder Associates
Barrie, Ontario, Canada

SCALE	AS SHOWN
DATE	27 JUN 2006
DESIGN	
CAD	J REGIER
CHECK	
REVIEW	
FILE No.	051112506AAQUAT.dwg
PROJECT No.	05-1112-506 REV.
FIGURE	2.8-1

PLOT DATE: June 27, 2006
FILENAME: T:\Projects\2005\05-1112-506 (Tatham, Atherley)\-AA-\051112506AAMAP.dwg [F2]



Golder Associates
Barrie, Ontario, Canada

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CAD	J REGIER
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FILE No. 051112506AAMAP
PROJECT No. 05-1112-506 REV.

Refer to Figure 2.8-5 for Legend and Notes

metres
0 50 100 250 500
SCALE 1:12500

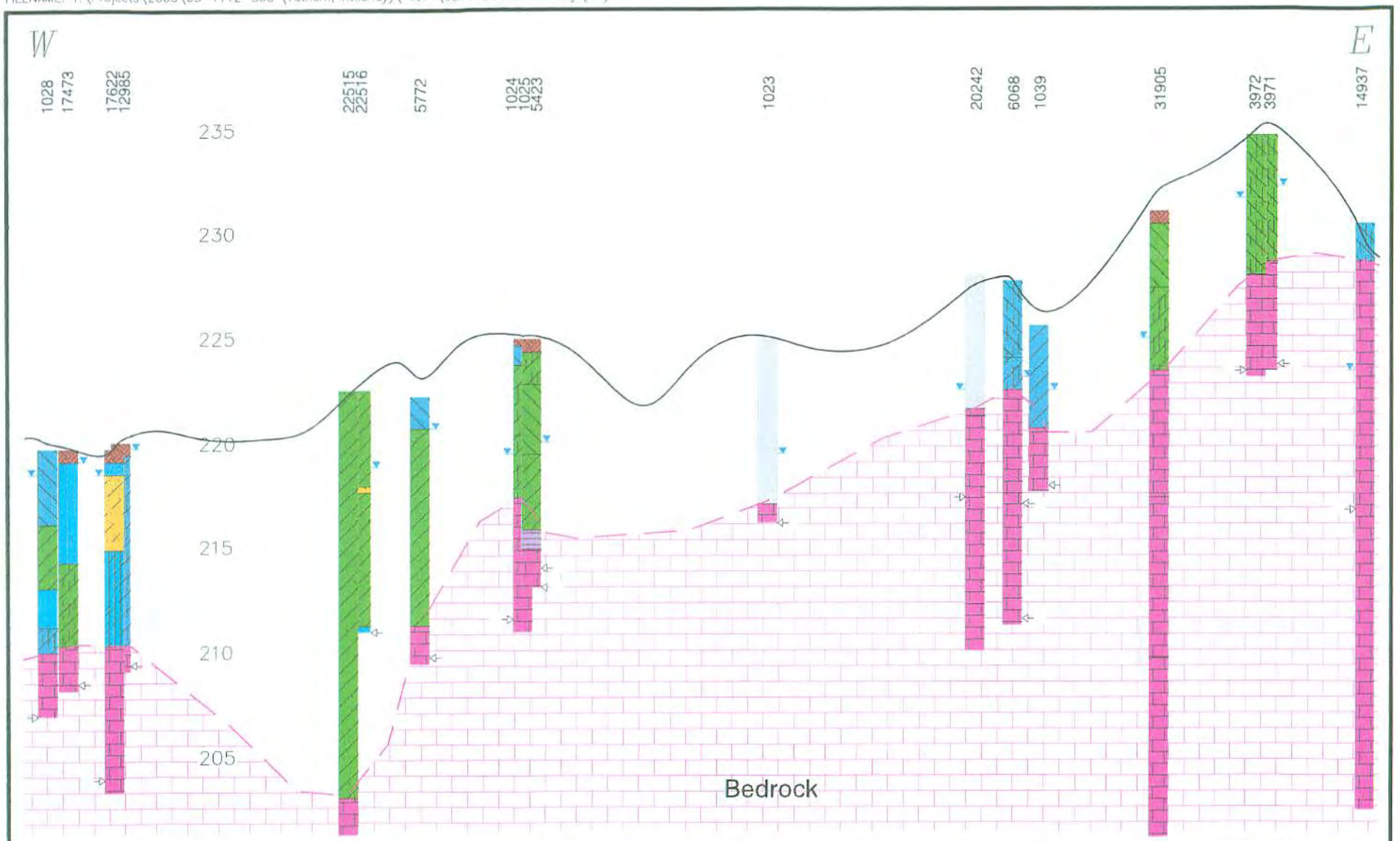
TITLE

SECTION C - C

RAMARA TOWNSHIP

FIGURE 2.8-2

PLOT DATE: June 28, 2006
FILENAME: T:\Projects\2005\05-1112-506 (Tatham, Atherley)\-AA-\051112506AAMAP.dwg [F3]



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PROJECT No. 05-1112-506 REV.

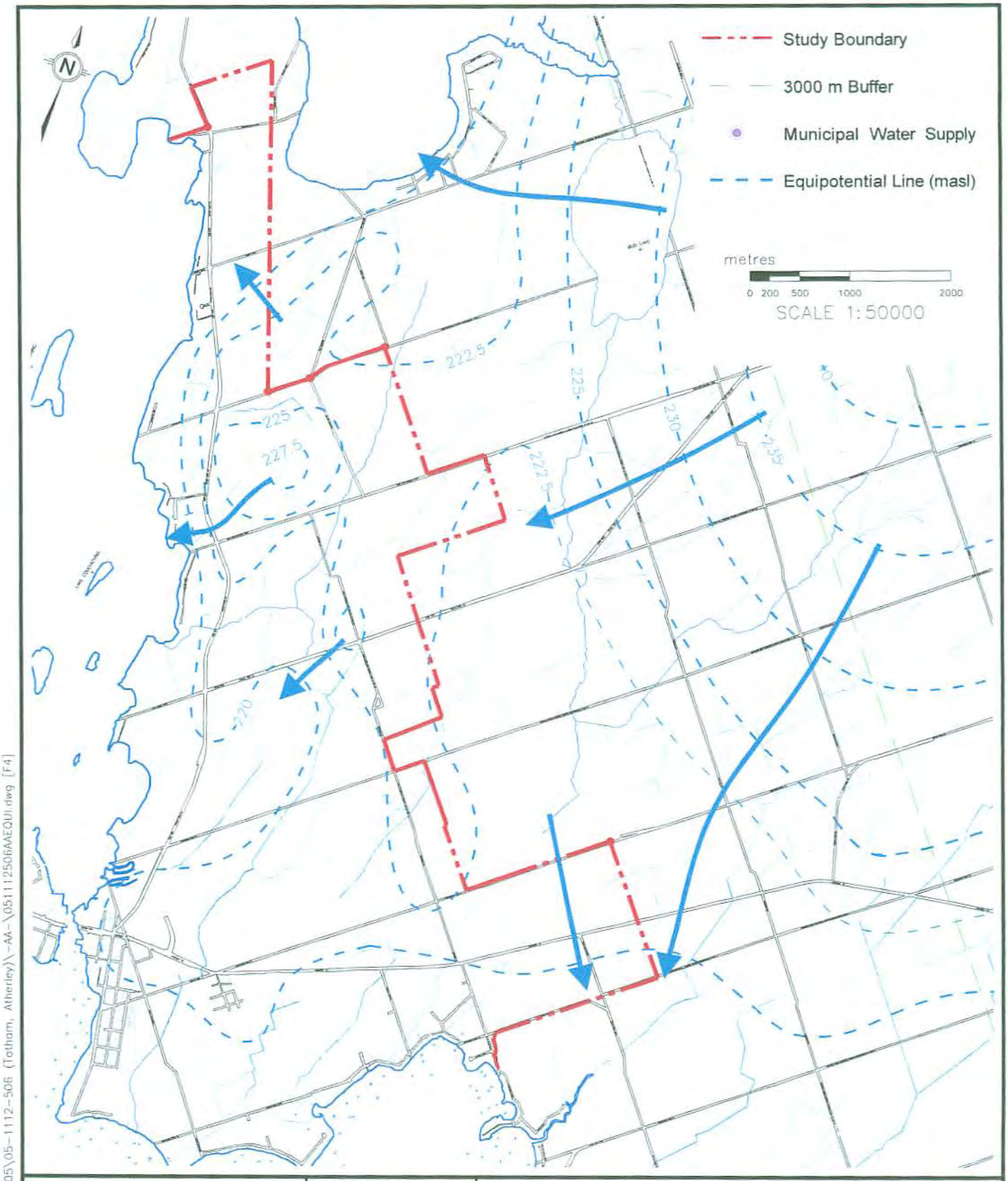
metres
0 50 100 250 500
SCALE 1:12500

TITLE

SECTION F - F'

RAMARA TOWNSHIP

FIGURE 2.8-3



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PROJECT No.	05-1112-506
REV.	

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TITLE

POTENTIOMETRIC SURFACE

RAMARA TOWNSHIP

FIGURE **2.8-4**

PLOT DATE: June 28, 2006
FILENAME: T:\Projects\2005\05-1112-506 (Tatham, Atherley)\-AA-\051112506AAEQUI.dwg [F4]


Unoxidized CLAY, Blue, Grey, White, or Undefined CLAY


Oxidized CLAY, Brown, Red, Yellow


SILT


SAND


GRAVEL


STONES, Rounded GRAVEL, PEBBLES


BOULDER


TILL


SHALE


DOLOSTONE


LIMESTONE


CRYSTALLINE ROCK

	Secondary/ Some	Trace	Minor	
Clayey				Clay
Silty				Silt
Sandy				Granular

GSC Coding

- Unknown / Previously Dug or Drilled
- Peat/Loam
- Aquifer
- Aquifer Clayey
- Silt / Sandy Silt
- Silt Clayey
- Clay
- Till
- Limestones
- Shales
- Precambrian

- Screen
- Recorded Static Water Level
- Water Producing Zone
- Flowing Well
- 23453 MOE Recorded Private Well
- 27 Tested Rate (L/min)

STRATIGRAPHY (see Note)

Hydrostratigraphic Contact

Sedimentary Bedrock
Limestone or Shale

NOTE: On all sections, boundaries between soil strata have been determined only at well and test well locations. Between the wells and test wells, boundaries are not proven but are assumed from geological evidence.

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CAD	J REGIER
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REVIEW	

FILE No. 051112506AAMAP.dwg : F5
PROJECT No. 05-1112-506 REV.

TITLE
HYDROGEOLOGICAL SYMBOLS

HYDROGEOLOGICAL INVESTIGATION

FIGURE 2.8-5

PLOT DATE: June 28, 2006
FILENAME: T:\Projects\2005\05-1112-506 (Tatham, Alberley)\-AA-\051112506AAMAP.dwg [F5]

gradient), the width of the groundwater flow path and the ease with which the water flows through the aquifer (aquifer transmissivity).

The wide spacing between the water level contour lines indicates sluggish groundwater flow and the hydraulic gradient is low at 0.0013 to 0.0023 (Figure 2.8-4). The flow path is approximately 10 km and the aquifer transmissivity is estimated to be 10 to 100 m^2/day. The flow across the width of the site is estimated to be as high as approximately 1,600 to 2,300 m^3/day.

3.0 ASSESSMENT OF EXISTING SERVICING COMPONENTS

3.1 DRAINAGE AND STORMWATER MANAGEMENT

3.1.1 Subwatershed Drainage Areas

The Study Area is located within watersheds of Lake Couchiching, Lake Simcoe, Lake St. John and Mud Lake. It has been divided into 18 sub-watershed areas as shown on Map 7 and described as follows:

Lake Simcoe Watershed

Area No. S1 is located in the southwest corner of the Study Area, bounded to the west and south by Lake Simcoe. This area encompasses the built up area of Atherley Village and cottage development along the shores of Lake Simcoe. The surficial soils in the higher elevations are classed as loam with good drainage characteristics while the balance of the area is classed as clay loam with imperfect drainage characteristics. The existing land use is predominantly residential with some commercial development along Highway 12 and small areas of agricultural use. Surface drainage flows from the east to the west via sheet and ditch flow through various outlets to Lake Simcoe.

Area No. S2 is located in the west central section of the Study Area centered over the Highway 12/ Concession Road 11 intersection and extending completely across the Study Area in a northeast/ southwest orientation. The surficial soils are predominantly classed as clay loam having imperfect drainage characteristics through the central portion of the area with sandy loam exhibiting good drainage characteristics in some of the areas of higher elevation. The existing land use is predominantly agricultural and forest with some residential clusters around Highway 12 and Balsam Street. This area also includes the Mara Provincial Park. Surface drainage flows via sheet and ditch flow to Municipal Drain No. 2 which bisects the complete length of the drainage area and flows in a southwest direction outletting to Lake Simcoe.

Area No. S3 is located in the south central region of the Study Area, extending in a southwest direction from just north of Concession Road 11 across Orkney Beach Road to Lake Simcoe. Surficial soils in the northeast corner of this area are sandy loam exhibiting good drainage characteristics while the balance of the area is clay loam with imperfect drainage characteristics. The existing land use is predominantly agricultural and vacant with residential clusters along Highway 12 and Orkney Beach Road. Surface drainage flows via sheet flow to an award drain which bisects the full length of the area from northeast to southwest, eventually outletting to Lake Simcoe south of Orkney Beach Road.

Area No. S4 is also located in the central region of the Study Area, from Concession Road 11 in the north to Lake Simcoe in the south. The surficial soils are predominantly clay loam with imperfect drainage characteristics through the central portion of the area with some loam exhibiting good drainage characteristics in the higher elevations along the eastern boundary. The existing land use is predominantly agricultural and vacant land with some residential development along Highway 12 and Orkney Beach Road. Surface drainage flows to a central water course which begins in a forested wetland north of Highway 12 and flows in a southwest direction to a second forested wetland north of Orkney Beach Road, eventually outletting to Lake Simcoe.

Area No. S5 is located in the east central region of the Study Area covering the Highway 12 and Plum Point Road intersection and continuing southwest to Orkney Beach Road and Lake Simcoe. The surficial soils are predominantly loam with good drainage characteristics except for a small area of clay loam with imperfect drainage characteristics near Highway 12. The existing land use is predominantly vacant and agricultural, with residential development fronting on Highway 12 and rural roads. Surface drainage is overland via sheet flow and ditch flow to a central watercourse which bisects the area, flowing southwest from Highway 12 to Orkney Beach Road and outletting to Lake Simcoe.

Area No. S6 is located near the east end of the Study Area extending from north of Highway 12 to Concession Road 10 and encompassing the settlement of Uptergrove and Plum Point. The surficial soils are predominantly loam with good drainage characteristics. There are two isolated areas of clay loam with imperfect drainage characteristics and one area of organic muck in the southwest corner which exhibits poor drainage characteristics. The existing land use is predominantly rural and agricultural with residential clusters in the Plum Point and Uptergrove areas. Surface drainage flows via sheet and ditch flow to a watercourse originating just south of Highway 12 which flows southwesterly through a forested wetland in the Plum Point area and eventually outlets to Lake Simcoe.

Area No. S7 is located in the southeast corner of the Study Area. The surficial soils are predominantly loam with good drainage characteristics except for an area of clay loam with poor drainage characteristics along the eastern boundary. The existing land use is predominantly agricultural and forest, with some individual residential lots and the Uptergrove Public School. The area drains via sheet flow and road side ditches to a watercourse south of the area which flows southwesterly, eventually outletting to Lake Simcoe.

Mud Lake Watershed

Area No. M1 is located north of Highway 12along the eastern boundary of the Study Area, and is divided by Concession 12. The surficial soils are predominantly loam with good drainage characteristics. The existing land use is predominately vacant and agricultural. Surface drainage is overland via sheet flow and ditch flow toward the east. Flows are eventually conveyed to wetlands outside of the Study Area which outlet to Mud Lake.

Lake Couchiching Watershed

Areas No.C1 and C2 are located at the very northern part of the Study Area, between Lake Couchiching. The areas proposed for development are bisected by a parcel of land belonging to Mnjikaning first nations. The surficial soils are predominantly loam, with good drainage characteristics. The existing land use is predominantly vacant agricultural, with residential development fronting onto Rama Road and Lake Couchiching. Surface drainage is overland via sheet flow and ditch flow to water courses that drain to Lake Couchiching.

Area No. C3 is located between the Mnjikaning First Nations' lands and is divided in half by Rama Road. The surficial soils are predominantly sandy loam with good drainage characteristics. The existing land use is predominantly vacant agricultural with residential development between Lake Couchiching and Rama Road. Surface drainage flows via sheet and ditch flow to water courses outletting to Lake Couchiching.

Area No. C4 is predominately covered by the Mnjikaning First Nation Lands; however, there are approximately 24 hectares of land available for development under the Official Plan. The area is divided by CNR and is north of the Mara Rama Boundary Road. The surficial soils are predominantly loam exhibiting good drainage characteristics. The existing land use is vacant agricultural. Currently road access is not provided to the area. Surface drainage is overland flow via sheet flow and ditch flow to a central water course which bisects the area, flowing north and east across Rama Roads and outletting to Lake Couchiching.

Area No. C5 is a small subwatershed along the shore line of Lake Couchiching just north of the Mara Rama Boundary Road, extending just east of Rama Road. The surficial soils are mix of loam with good drainage characteristics and clay loam with imperfect drainage characteristics. The existing land use is

vacant agricultural with residential development along Lake Couchiching. Surface drainage is overland via sheet flow and ditch flow to a central swale that divides area C5 approximately in half. Intermittent flow in the swale runs southwest from Rama Road, outletting to Lake Couchiching.

Area No. C6 is a 22 hectare area fronting onto Lake Couchiching and extending north east across Rama Road. The surficial soils are predominantly clay loam with imperfect drainage characteristics. The existing land use is vacant agricultural on the east side of Rama Road with residential developments fronting onto Lake Couchiching. Surface drainage flows via sheet flow and ditch flow to a central swale which bisects area C6. Flow direction is southwest crossing Rama Road and eventually outletting to Lake Couchiching.

Area No. C7 is located in the central region of the Study Area. It extends from Highway 12 and Rama Road to north of the Mara Rama Boundary Road. This area covers most of the Study Area between Monck Road and Mara Rama Boundary Road. The surficial soils are predominantly clay loam with a mix of good to imperfect drainage. There are large wetland areas located in the north central region of the sub watershed area, and in the southwest adjacent to Lake Couchiching.

Area No. C8 is located in the southwest corner of the Lake Couchiching watershed, bounded by Highway 12 to the south and Concession Road 12 to the north. Surficial soils in the higher elevations are classed as a loam with good drainage characteristics, while the balance of surficial soils are classed as a clay loam with imperfect drainage characteristics. The existing land use is predominantly agricultural with some commercial and residential development along the north side of Highway 12 in Atherley Village. Surface drainage flows from the southwest to the northeast via sheet and ditch flow into the Atherley Wetland area and eventually to Lake Couchiching.

Lake St. John Watershed

Area No.LSJ1 and LSJ2 are located within the Study Area, but form part of the Lake St. John watershed. These areas are located in the northern peninsula of the Study Area west of Rama Road. The surficial soils are predominantly sand loam with good drainage characteristics. The existing land use is vacant agricultural. Surface drainage is overland via sheet flow and ditch flow eventually being conveyed to Lake St. John, outside the Study Area.

3.1.2 Stormwater Management

Surface water runoff throughout the majority of the Study Area is captured and conveyed via open ditches, municipal drains, award drains and watercourses to Lake Simcoe, Lake Couchiching, Mud Lake and Lake St. John. Some storm sewer systems are also present in the built-up areas of Atherley and the Mnjikaning First Nations land.

Stormwater management facilities, in the form of wet ponds, are present in only two recent developments, The Crossings subdivision and the Leatherdale Marina commercial development. Preliminary designs for additional site specific facilities have also been presented with a number of recent development proposals. A few facilities have also been noted on the First Nations land, although no detailed information is available.

3.2 SEWAGE WORKS

As described in Section 2.1 the existing land use in the Study Area is largely residential, clustered in a number of settlements and shoreline residential areas. All residential sewage disposal is via subsurface disposal, i.e. typical septic tank collection and tile field disposal. The majority of remaining land uses also utilize subsurface sewage effluent disposal, except for Fern Resort on Lake Couchiching which has a sewage treatment plant with tertiary treatment and direct discharge to the lake.

Mnjikaning First Nation lands are within the Study Area but under separate jurisdiction and therefore not a part of the study. Within the First Nation lands Mnjikaning operates a large state of the art sewage

treatment plant with direct discharge to Lake Couchiching, serving the Casino Rama development and surrounding new commercial, residential and institutional uses.

3.3 WATER WORKS

Similar to the existing sewage works described in Section 3.2, all existing development in the Study Area is provided potable water from individual supply. The majority are from groundwater wells (dug or drilled) with some shoreline development obtaining water from Lakes Simcoe or Couchiching.

There are 580 wells contained in the Ontario Water Well database for the Study Area, 481 of these wells are constructed in the bedrock and 99 are constructed in the overburden. Nineteen of these wells were not used because of a lack of supply or poor water quality.

Adequate supplies for single family homes are obtained from 97% of the wells drilled into overburden aquifers. The yield of overburden wells ranges from 9 L/min to 450 L/min, with the highest capacity well at the Mara Provincial Park, however the long term pumping rate for this well was not established by testing. The water quality recorded in 99% of overburden wells is fresh.

Adequate water supplies are obtained from 91% of wells drilled into the bedrock aquifer. Of the remaining 9% of wells, 75% were used as marginal supplies and the remaining 25% were abandoned due to poor quality or inadequate supply. There have been 16 wells drilled in the Study Area since 1950 with yields between 136 and 360 L/min, however pumping tests have been limited to 2 or 3 hours and long term yields have not been established.

3.4 TRANSPORTATION

The existing transportation network within the Study Area is dominated by Highway 12 running east-west and County Road 44 (Rama Road) running north-south, both major 2-lane roads generally bisecting the Study Area, except that Highway 12 west of County Road 44 has a 4-lane cross-section. These roads are under the jurisdiction of the Provincial and County governments, respectively.

The remainder of the roads within the Study Area are under the control of the Township (except for roads within the First Nations lands). In 2003, Cansult Tatham Transportation Consultants completed a Road Needs Study, which inventoried and assessed each road section width and type, structural and drainage adequacy, etc. Appendix D contains inventory sheets from the Road Needs Study applicable to the Study Area.

Existing design peak hour traffic volumes on Highway 12 west of County Road 44 were determined from 2003 AADT (Annual Average Daily Traffic), traffic pattern type and historic counts acquired from MTO. Existing traffic volumes on Highway 12 east of County Road 44 were determined from intersection counts completed in October 2003 as referenced in the *Traffic Impact Report, Hendricks Subdivision, Proposed Development, Part of S ½ of Lot 29 and Part of N ½ of Lot 29, Concession 11, Township of Ramara, County of Simcoe.* Traffic volumes on County Road 44 were determined from 2005 AADT obtained from the County of Simcoe. To reflect 2006 traffic levels the data was increased based on historic growth rates on Highway 12 in the area.

The resulting existing peak hour traffic volumes on Highway 12 are in the order of 1050 and 1950 vehicles per direction east and west of County Road 44 respectively. Whereas, the resulting existing peak hour traffic volumes on County Road 44 north of Highway 12 are in the order of 900 vehicles per direction.

As per the *Township of Ramara Official Plan*, provincial highways and county roads are classified as arterial roads, the primary purpose of which is to carry high volumes of traffic and provide through travel routes across and within the Township. Direct access points onto an arterial road shall be limited. For planning purposes, the capacity of an arterial road is generally in the order of 800 to 900 vehicles per hour per lane, which considers the adverse impacts on road capacity resulting from reduced travel

speeds, vehicle composition, intersection effects and the presence of intersecting side streets and driveways. For purposes of this report, a capacity of 900 vehicles per hour lane has been assumed for both Highway 12 and County Road 44.

4.0 DESIGN CRITERIA

4.1 ESTIMATED FUTURE POPULATION

Table 4.1 sets out the 2002-2031 population and dwelling estimates that are revised from the background study to the Ramara Official Plan.

Population and dwelling estimates are at the higher end of expectations and may not reflect estimates by the province and the county. The estimates are intended to test servicing feasibility and costs.

Table 4.1

Population and Housing Estimates 2001 – 2031

YEAR	POPULATION	DWELLINGS
2001	9,218	3,617
2006	10,502	4,164
2011	11,681	4,664
2016	12,776	5,159
2021	13,890	5,667
2026	14,840	6,089
2031	15,582	6,439
30-year population growth	6,364 people	+69%
30-year dwelling growth	2,822 dwellings	+78%

Assuming one-third to one-half of the new dwelling units (950-1400) are in the Study Area, less 300 units already approved in Uptergrove Estates (south west corner of Study Area), the estimated 30 year population growth will be 1625-2750 residents (650-1100 units).

4.2 STORMWATER MANAGEMENT

4.2.1 Stormwater Management Constraints and Opportunities

A number of guidelines and regulations are in place to address the management of stormwater runoff from development sites, including:

- Township of Ramara Design Criteria; (1991)
- Lake Simcoe Region Conservation Authority Watershed Development Policies; (April, 2006)
- Ministry of Environment Stormwater Management Planning and Design Manual. (2003)

These guidelines should be consulted for detailed criteria regarding stormwater management, but the key items are summarized as follows.

The existing quality of the receiving watercourse is a key factor in selecting and sizing stormwater management (SWM) controls. The Ministry of Natural Resources (MNR) and LSRCA have used three levels of fish habitat in their classification system. Type 1 habitat includes, but is not limited to, spawning areas for coldwater species such as brook trout, essential rearing and feeding areas. Type 2 habitat includes feeding areas for adult fish, unspecialized spawning and rearing areas. Type 3 habitat includes

municipal drains and highly altered watercourses that have a low capacity for fish production and do not have a reasonable potential for enhancement or restoration.

Formerly, the level of SWM protection was directly equated to the type of habitat, that is, Ministry of the Environment (MOE) Level 1 SWM protection was used for MNR Type 1 habitat. In the latest addition of the MOE "Stormwater Management Planning and Design Manual" (2003) protection Levels 1, 2 & 3 have been replaced by "Enhanced", "Normal" and "Basic" however the correlation with fisheries classification remains unchanged.

The classification of existing receiving streams should be confirmed by the MNR and LSRCA during detailed design of SWM facilities. At this stage, in accordance with LSRCA guidelines, we recommend "Enhanced" protection be applied until detailed environmental studies are completed.

With respect to quantity control, both Township and LSRCA guidelines requires post-development peak flows to be controlled to pre-development levels for all design storm events, up to the 1:100 year storm.

Ministry of Transportation Ontario (MTO) policy also requires SWM quantity control for new development upstream of highway rights-of-way to maintain post development peak flows at pre-development levels. Therefore separate SWM control facilities will be required for areas north and south of Highway No. 12.

4.3 SEWAGE AND WATER WORKS

Proposed sewage and water infrastructure design was evaluated assuming an average daily flow of 450 L/cap/day, for residential properties , and 28 m^3/ha/day for commercial development, with typical peaking and infiltration factors as per Township and MOE design guidelines.

Sewage waste disposal is governed by the MOE (1995) Rural Land Development Guidelines. If in-ground sewage waste disposal on individual lots is contemplated then the combination of treatment and dilution of nitrate to a concentration at or below the Ontario Drinking Water Standard of 10 mg/L is required. The general concept is that nitrate from a Class 4 treatment system is at a concentration of 40 mg/L, therefore sufficient incident recharge is required to dilute the waste by a factor of 4.

The soil conditions have a large bearing on the volume of incident recharge, hence the number of lots a property can support. In areas of sandy soils and confined water supply aquifers the lot density could be as high as 2 lots/Ha. In areas of heavy soils the lot density would be approximately 1 lot/Ha. Site specific studies are required prior to assessing the development capacity of a property.

Communal or large sewage waste disposal systems requiring a Certificate of Approval are required to meet a more stringent standard than private on-site disposal systems. Guideline B-7 applies, which essentially requires a 16:1 dilution ratio if the starting nitrate concentration is 40 mg/L. Sewage treatment plants are most often used for large sewage disposal systems that produce an effluent with a nitrate concentration below 10 mg/L. The effluent disposal to a tile field will have to account for high water table conditions and fine grained soils.

4.4 TRANSPORTATION

The transportation component of the MSP involves assessing the capability of the proposed road network in terms of roadway capacity and intersection level of service in accordance with MTO Geometric Design Standard for Ontario Highways and Transportation Research Board Highway Capacity Manual.

4.4.1 Background Traffic Growth

Historic counts (1993 to 2003) on Highway 12 in the area indicate that over the past 10 years, two-way traffic has increased at a rate of 6.5% per year. Population and employment projections as documented in the *Population, Household & Employment Forecasts Update, Simcoe County, Final Report* were also

considered. For the period 2001 to 2026, the annual growth rates for both population and employment were in the order of 2.0%.

Given the wide variety of potential uses in of the destination commercial developments (D1-D5 as shown on Map 10) along County Road 44 near Casino Rama, for purposes of this report, an annual growth rate of 6.5% and 2.0% has been applied for the periods of 2006 to 2011 and 2011 to 2031 respectively for Highway 12 and County Road 44. An annual growth rate of 1.1% has been applied for all local roads for the period of 2006 to 2031. These growth rates translate to an overall increase of 104% for Highway 12 and County Road 44, and an overall increase of 31% for all local roads.

4.4.2 Growth from Residential and Village Commercial Areas

Residential areas R1, R2 and R3 and Village Commercial areas C1 and C2 as shown in Map 10 within the Study Area have been considered. Development density of 9.3 units per hectare was applied for these residential areas. For the commercial areas, 55% of the gross area was assumed as the net commercial area and in addition, 40% of the net commercial area would be developed as gross floor area.

Trips generated by these areas have been specifically estimated as per the *ITE Trip Generation Manual*. Trip generation rates for the residential and commercial land uses were determined based on the single family detached land use (ITE land use code 210) and specialty retail centre land uses (ITE land use code 814) respectively.

4.4.3 Future 2031 Traffic Volumes

Estimates of future traffic volumes for the year 2031 have been determined based on the following:
- 2006 traffic volumes;
- development specific volumes; and
- consideration for the 25-year growth rates.

The resulting future traffic projections on Highway 12 are in the order of 2400 and 4450 vehicles per hour east and west of County Road 44 respectively. Peak hour traffic volumes on County Road 44 are expected to be in the order of 2400 to 3000 vehicles.

5.0 ALTERNATIVE SOLUTIONS FOR SERVICING

5.1 DO NOTHING

The option of the "Do Nothing" alternative would not address the problem statement, to provide appropriate servicing in sanitary, stormwater, water supply and transportation systems to meet the needs of the Study Area's projected population. This alternative would limit growth and the self sufficiency of the Township and is therefore not further considered.

5.2 STORMWATER MANAGEMENT

Stormwater collection can be by open ditches or storm sewers.

The options for providing stormwater management (SWM) for new development include:

Lot Level Controls

- Reduced slope lot grading. By constructing landscaped areas with flat slopes, generally less than 1%, ponding and infiltration are promoted and runoff is reduced.
- Soak away pits. Discharging roof drains to soak away pits promotes infiltration and reduces runoff.
- Porous pavement reduces runoff volumes and improves stormwater quality by infiltrating

contaminated runoff from parking and loading areas.

Conveyance Controls

- Pervious catchbasin and pipe systems which are constructed in crushed stone trenches or native porous soils promote infiltration and reduce runoff.
- Grassed swales and ditches reduce runoff velocities which promote sedimentation, infiltration and organic uptake. This reduces runoff and improves stormwater quality.

End Of Collection System Controls

- Filter strips constructed of native grasses and woody shrubs and trees improve stormwater quality by filtering runoff and reducing runoff by promoting ponding, infiltration and organic uptake.
- Infiltration trenches and basins constructed in crushed stone or porous soils promote infiltration and reduce runoff.
- Oil and grit separators improve stormwater quality by removing oil and grit.
- Constructed wetlands improve stormwater quality by ponding water over a large vegetated wetland which promotes sedimentation and organic uptake.
- Dry ponds improve stormwater quality by detaining water which promotes sedimentation and reduces peak flows.
- Wet ponds improve stormwater quality by mixing stormwater with retained water in the pond and detaining water which promotes sedimentation and reduces peak flows.

5.3 SEWAGE AND WATER WORKS

5.3.1 Overview

The options for providing sewage and water service within the Study Area include the following:

- individual private subsurface sewage disposal systems (with or without advanced treatment) and individual water supply from a drilled well;
- communal sewage facilities with subsurface disposal or direct discharge to surface water and communal well or surface water intake for water supply;
- full municipal system comprised of sewage collection, pumping, advanced treatment and effluent disposal by subsurface means, spray irrigation or direct discharge to surface water, and water supply systems utilizing surface water intake.

In addition to the above options there was also the consideration of obtaining service from an existing system such as those owned by the City of Orillia or Mnjikaning First Nations. This alternative was not considered viable from a financial perspective given the location of the growth areas and the distance to those systems. In addition, it is not believed those systems have additional spare capacity at this time.

A more detailed description of the options described above is provided in the following sections.

5.3.2 Individual Private Services

Development using individual septic systems and private wells is the least preferred servicing option when considering Provincial and County policies. Should this option be considered desirable the County Official Plan requires a settlement capability study to determine the long-term sustainability of this servicing option. In addition the individual developments must be planned and comply with Ministry of Environment Guidelines to ensure the impact from the effluent does not adversely affect the ground and surface water systems. The settlement capability study requires further environmental and hydrogeological evaluations to fully assess the potential impacts and establish appropriate development densities. It is noted that advanced treatment can be provided for individual septic systems which has the

effect of improving effluent quality and reducing potential impacts and/or increasing the development density.

On a preliminary basis average densities of 2 units per gross hectare (excluding environmental protection areas) could be anticipated utilizing individual private services. Actual allowable density would vary primarily depending on soil type and the amount of predicted infiltration for the area. Soil types within the central and western part of the Study Area are reported to be loams with good drainage and as such would be better suited to individual septic systems. Soils in the eastern part of the Study Area are not well drained and groundwater levels are high, making individual septic systems less desirable and requiring significant fill.

Service by individual well is typically only completed when the wells are owned privately and in conjunction with service by individual private septic systems. While it is understood that reasonable capacity wells have been developed within the Study Area, it is questionable whether a sufficient aquifer exists to serve new development. Hydrogeological investigations are necessary at the initial development proposal stages to verify there is sufficient quantity of water of a good quality.

Table 5.1 (overleaf) presents the development areas required to service the projected 30 year growth population with individual private services.

Individual septic systems and wells are owned by the lot owner and as such all maintenance responsibilities and potential long-term replacement remains the responsibility of the lot owner. Provision of a sewage disposal system with advanced treatment under the Ontario Building Code requires the lot owner enter into an agreement with a licensed maintenance company. Should treatment be appropriate, the Township would have to be prepared to monitor the maintenance of the systems and ensure the necessary agreements with maintenance providers are maintained by the home owners.

Individual septic systems cost in the order of $8,000 to $15,000 depending on the size of the system and need for imported fill. Treatment systems can add $5,000 to $7,000 to the cost. Individual wells cost between $8,000 to $10,000 depending on depth and level of treatment required. All costs are expended at the building stage.

5.3.3 Communal Services

Communal systems service higher density groups of buildings or homes such as in commercial areas or larger residential developments. For the development within the Study Area the sewage disposal systems would likely be comprised of sewage treatment facilities with advanced treatment and effluent disposal utilizing large subsurface systems or direct discharge to surface water. Similar to development on individual septic systems the effluent discharge would have to be shown to provide minimal impact to the ground and surface water systems. Unless the communal system was relatively small, (i.e. having a design flow less than 10,000 L/day) it is anticipated that some form of treatment would be necessary to improve the effluent quality to ensure minimal impact.

Communal water supply systems would consist of a lake-based source or groundwater supply, with central treatment and storage facilities and a distribution system of watermains, valves, hydrants, individual services, etc. As noted for individual systems, it is questionable whether sufficient groundwater is available to service the amount of development suggested, and detailed hydrogeological studies would be required to verify adequate water supply.

Average overall densities for development utilizing communal systems would be higher than the average densities resulting from individual septic systems, at approximately 9 units per gross hectare. This is due to a more efficient layout of the sewage works and development on communal systems can be clustered on small lots.

Table 5.1
Development Area Options
Private Individual Water Supply and Wastewater Treatment (Map 9a)

1. **30-Year Dwelling Estimate**

Assume one-third to one-half of new estimated dwellings are in Atherley-Uptergrove and Longford Mills

950 -1400 units	2400 - 3500 residents	(Less 300 units approved in Uptergrove Estates)
Plan for:	650 - 1100 units	1625 - 2750 residents

Density - 2 units per gross residential area hectare and 5 persons per hectare

Estimated hectares: 340 - 550 hectares plus 10% oversupply

Gross hectares: 420 - 690 hectares in Study Area

2. **Potential Residential Development Areas**

Atherley South	198 hectares
Atherley North	197 hectares
Atherley East	92 hectares
Uptergrove	150 hectares
Longford Mills	40 hectares
Total	677 hectares

3. **Potential Village Commercial Area** 38 hectares

4. **Potential Institutional-Commercial** 43 hectares

5. **Potential Destination Commercial** 304 hectares

Total Development Area **1062 hectares**

Table 5.2 (overleaf) presents the development areas required to service the projected 30 year growth population with communal services.

When considering development on communal sewage services with subsurface effluent disposal the tile beds should be located in areas with the most suitable soil conditions and low groundwater levels, and additional land area should be reserved for the possibility of long-term replacement of the tile beds. It is estimated that approximately 30% of the land area of any development parcel would be required for sewage works.

Communal sewage or water systems must be municipally owned if the facilities serve multiple lots under separate ownership. If private ownership is appropriate, then financial agreements must be put in place to ensure long-term maintenance and replacement. In addition the Ministry of Environment typically requires an agreement with the municipality that should any difficulties arise (i.e. non-compliance with Certificates of Approval for sewage systems over 10,000 L/day), the municipality would agree to assume ownership and control. For commercial development the requirements for municipal guarantees are reduced provided the development and sewage system remains under one ownership.

There is economy in providing treatment on a communal basis rather than on an individual basis but that is somewhat offset due to increased costs for sewage collection and pumping, water distribution, etc. The cost for communal systems typically range from $10,000 to $20,000 per unit depending on the need for imported fill and the type of treatment provided. The costs are incurred at the building stage and as such can be financed as development occurs.

5.3.4 Full Municipal Services

In a full municipal sewage service the system would be comprised of a collection system, pumping stations and forcemains, and an advanced treatment facility followed by effluent disposal through subsurface disposal, spray system or direct discharge to a surface water.

A municipal water supply system to serve development within the Study Area could be supplied from a lake-based source (Lake Couchiching or Lake Simcoe) or a groundwater supply (wells). Given the development areas are large and as it is understood that reasonable capacity wells, may not be available it is anticipated that the system would have a lake-based supply. The system would then be comprised of an intake extending into the lake, storage for equalization, emergency and fire protection, filtration and treatment, pumping and distribution. Trunk mains would be relatively large due to the size of the Study Area. The level of treatment would be a function of the raw water quality. The anticipated costs for establishing a new water works system would be in the range of $7,500 per lot. This cost would occur upfront in the development process. From an operating cost perspective, it is suggested that a system servicing a minimum of 200 lots is desired to ensure annual operating charges remain reasonable and competitive. A full municipal water supply system is not desired if sewage service is provided by individual private septic systems.

Average gross densities of 12 units/ha (excluding EP lands) are easily achievable on full services. Table 5.3 (overleaf) presents the development areas required to service the projected 30 year growth population with full municipal services.

With respect to sewage collection and pumping there are 18 subwatersheds within the Study Area. Depending on what lands develop, each could require a series of gravity sewers and a pumping station and forcemain to convey the sewage to the adjacent subwatershed or the sewage treatment facilities. Although feasible, the cost would be relatively high on a per unit basis.

Given the magnitude of development, effluent disposal by subsurface means for one large, central sewage treatment facility is considered impractical. Lake Simcoe is a sensitive receiver and there was a Cabinet Order prohibiting further point source discharges. Similarly Lake Couchiching is a sensitive receiver, however a discharge may be possible pending a full assimilative capacity study.

Table 5.2
Development Area Options
Communal Water Supply and Wastewater Treatment (Map 9b)

1. **30-Year Dwelling Estimate**

Assume one-third to one-half of new estimated dwellings are in Atherley-Uptergrove and Longford Mills

950 -1400 units	2400 - 3500 residents	(Less 300 units approved in Uptergrove Estates)
Plan for:	650 - 1100 units	1625 - 2750 residents

Density - 9 units per gross residential area hectare and 10 persons per hectare

Estimate hectares: 170 - 275 hectares plus 10% oversupply

Gross hectares: 210 - 345 hectares in Study Area

2. **Potential Residential Development Areas**

Atherley South	198 hectares
Atherley North	97 hectares
Uptergrove	26 hectares
Longford Mills	40 hectares
Total	361 hectares

3. **Potential Village Commercial Area** — 38 hectares

4. **Potential Institutional-Commercial** — 43 hectares

5. **Potential Destination Commercial** — 304 hectares

Total Development Area — **746 hectares**

Table 5.3
Development Area Options
Municipal Water Supply and Wastewater Treatment (Map 9c)

1. **30-Year Dwelling Estimate**

Assume one-third to one-half of new estimated dwellings are in Atherley-Uptergrove

950 -1400 units	2400 - 3500 residents	(Less 300 units approved in Uptergrove Estates)
Plan for:	650 - 1100 units	1625 - 2750 residents

Density - 12 units per gross residential area hectare and 30 persons per hectare

Estimate hectares: 60 - 95 hectares plus 10% oversupply

Gross hectares: 70 - 120 hectares

2. **Potential Residential Development Areas**

Atherley South	114 hectares
Atherley North	22 hectares
Total	136 hectares

Plus Longford Mills (private water & sewer) 40 hectares

Destination Commercial Area 238 hectares

71 hectares
71 hectares
96 hectares

Village Commercial Area 38 hectares

Institutional-Commercial Area 43 hectares
plus Destination Commercial Area (private water & sewer) 66 hectares
Density: estimated 5 pph (1925 employees)

Total Development Area **561 hectares**

After considering the options the most viable solution for full municipal sewage servicing would appear to be mechanical treatment with effluent storage and seasonal discharge by spray irrigation or to a surface water body. The estimated cost for such a system would be in the range of $7,500 per residential unit, (1 m^3/day) including the cost for collection and pumping.

The operating costs would be high during the initial years of operation until there were 30 to 50% of the new homes constructed and occupied. Given the fragmented ownership within the Study Area, it is doubtful that an individual development site could finance the necessary studies and initial construction of a full municipal sewage system capable of being expanded to serve the entire Study Area.

5.4 EVALUATION OF ALTERNATIVES

5.4.1 Stormwater Management

Based on available background information the use of SWM controls promoting infiltration are generally not recommended for the Study Area due to the impervious soils and high water table. It should be noted that some limited areas exist with pervious soil and groundwater conditions that could support infiltration facilities. However end-of-pipe SWM facilities will likely be required due to the limited size of the porous soil areas, but additional study could be completed.

A detailed review of lot level and conveyance controls at this stage in the planning process is somewhat premature. What is important to note is that their use is fundamental in reducing runoff volumes and improving the quality of runoff at the source. Lot level controls are located on development sites and conveyance controls are generally located within municipal rights-of-way or servicing corridors therefore specific blocks of land do not need to be identified in the planning process for these types of systems.

5.4.2 Sewage and Water Works

Table 5.4 (overleaf) summarizes the advantages and disadvantages of each of the sewage and water servicing options.

In each designated area the servicing options were further evaluated based on a number of criteria:

<u>Natural Environment</u>
- Whether development will have a positive or negative effect on existing physical features – woodlands, wetlands, etc.

<u>Socio-economic</u>
- Change to tax base
- Change to employment opportunities
- Change to quality of life
- Cost of service

<u>Public Health</u>
- Effects on ground and surface water quality
- Effects on air pollutants
- Effects existing sub-surface disposal systems

<u>Cost</u>
- Cost for implementation, phasing, financing, cost-sharing
- Cost to construct sewage and water facilities
- Cost to operate and maintain facilities

Table 5.4
SERVICING OPTIONS EVALUATION

Solution	Advantages	Disadvantages	Capital Cost
Private	• Services constructed with homes • No significant upfront costs for developers • No on going maintenance/monitoring cost for Township	• Least preferred by Provincial & County policies • No monitoring to ensure quality of services to users • Sub-surface effluent disposal requires significant land area (30 – 50 % of developable lands) • Low density is inefficient and results in higher Township costs to maintain roads and drainage systems • Less than ideal soil and groundwater conditions for conventional sub-surface effluent disposal • Ground water supply for private wells not believed adequate for total development	• Atherley/Uptergrove - $44 million • Rama Road North - $15 million • Rama Road - $60 million • Longford Mills - $2 million
Communal	• Higher quality sewage effluent treatment prior to disposal • Net reduction in phosphorus loadings to lakes • Treated and monitored water supply • More efficient land use • Possible treatment and re-use of grey water reduces effluent disposal requirements, and land use	• Large land area required for effluent disposal: highly dependant on actual land uses • Ground water supply for communal wells may not be adequate for total projected growth • Developer to subsidize operating costs until sufficient occupancy of development • Ongoing maintenance & operation of water & sewage works by Township • Highway and County Road crossings may be required for services	• Atherley/Uptergrove - $42 million • Rama Road North - $15 million • Rama Road - $60 million • Longford Mills - $4 million
Municipal	• Preferred method by Provincial & County policies • Advanced treatment, both sewage & water • Regulatory monitoring to ensure adequate treatment • Most efficient land use (highest lot coverage) • Not constrained by soil and ground water conditions • Opportunities for phasing of facilities to accommodate future development	• High level of treatment required to meet regulatory requirements, phosphorus loading to lakes cannot be reduced without servicing existing development • Complete growth area cannot be serviced without also servicing existing development • Point source discharge to Lakes may not be viable pending outcome of ongoing Provincial IGAP • Highway & County Road crossings required for services • Series of gravity sewers/forcemains/pump stations required for sewage collection. • High upfront financing costs • Lot costs higher than in neighbouring communities • Ongoing maintenance & operation of water and sewage works by Township	• Atherley/Uptergrove - $53 million • Rama Road North - $28 million • Rama Road - $113 million • Longford Mills - $9 million

The evaluation is summarized in a matrix in Table 5.5 (overleaf).

As a result of the evaluation, individual private servicing is not the preferred alternative.

Communal servicing appears to be acceptable from an environmental impact perspective provided strict design standards and municipal controls are put in place for each of the systems, including municipal responsibility for operations and maintenance.

Provision of full municipal services will likely result in too great an impact to the receiving lakes, subject to completion of the Provincial IGAP. In addition, implementation of this option is constrained due to high front end costs for new facilities.

6.0 PREFERRED SERVICING SOLUTIONS AND IMPLEMENTATIONS

Map 10 presents an overview of the preferred servicing solutions and 30 year service areas within the Study Area, described in the following sections.

The overall Study Area has been sub-divided into distinct service areas, based on land use and location where each is to be developed with a communal water and sewage system. Destination commercial service areas are designated D1 through D5, highway commercial areas are identified as C1 and C2 and residential development areas are designated as R1 through R4. It should be noted that these are preferred development areas based on the findings of the MSP. Development of other areas within the study area may be considered, provided appropriate technical studies confirm that development can proceed in accordance with the recommendations of the MSP, i.e. communal servicing.

6.1 STORMWATER MANAGEMENT

6.1.1 Preferred Solution

Centralized stormwater management (SWM) facilities have been identified for service areas C1, C2, and R1 through R4. The watershed characteristics in service areas D1 through D5 are highly variable – multiple road crossings, no distinct outlets, difficult topography, etc. which makes the implementation of centralized SWM facilities unfeasible. Stormwater management will be most appropriately dealt with as site specific development applications are processed. Due to timing for development or build-out of an area one or more temporary wet ponds may be required in each area.

Based on the relative size of the service areas identified as appropriate for centralised SWM facilities, the existing soil conditions, shallow groundwater conditions and the desired level of protection, the preferred option for end of collection system SWM control is a wet pond. By definition, an end of collection system SWM is located downstream of the area it services. The wet pond facilities for the Study Area should be located adjacent to the receiving watercourses at the lowest portion of each development area. The wet pond facilities should be located outside of the vegetated buffer/floodplain. Suitably sized blocks must be identified in the Study Area to site wet pond facilities. A wet pond consists of a sediment forebay to remove the larger particles suspended in stormwater, a permanent pool to further treat stormwater, extended detention storage above the permanent pool to detain stormwater which promotes sedimentation and reduces peak flows.

The facility is landscaped with submergent plants in the permanent pool, emergent plants along the edge of the permanent pool, riparian plants and woody shrubs and trees on the slopes of the pond above the permanent pool.

Table 5.5
Evaluation Matrix of Servicing Options

Evaluation Criteria 1 – highest impact/least preferred 3 – lowest impact/most preferred		ATHERLEY			RAMA ROAD			RAMA ROAD NORTH			LONGFORD MILLS		
		P	C	M	P	C	M	P	C	M	P	C	M
Natural Environment	Sewage	1	2	3	2	3	1	2	3	1	1	2	3
	Water	3	2	2	2	2	1	2	2	1	3	2	2
Socio-Economic	Sewage	1	3	2	1	2	3	1	2	3	1	3	2
	Water	1	3	2	1	2	3	1	2	3	1	3	2
Water Quality	Sewage	2	3	1	2	3	1	2	3	1	2	3	1
	Water	1	2	3	1	2	3	1	2	3	1	2	3
Cost - Construction, Implementation and Operation	Sewage	3	2	1	3	2	1	3	2	1	3	2	1
	Water	3	2	1	3	2	1	3	2	1	3	2	1
Sub-Total	Sewage	7	**10**	7	8	**10**	6	8	**10**	6	7	**10**	7
	Water	8	**9**	8	7	**8**	**8**	7	**8**	**8**	8	**9**	8
Total		15	**19**	15	15	**18**	14	15	**18**	14	15	**19**	15

Efforts should be made during planning stages to facilitate construction of the centralized facilities as soon as possible, at which time the temporary facilities should be decommissioned.

Provincial policy requires that a floodplain mapping study be prepared in conjunction with development along a watercourse with an upstream tributary area greater than 125 ha. This may apply to developments in drainage areas S2, S3, S4, S6, M1, C4, C7, and C8.

A buffer adjacent to all watercourses should be established, to maintain vegetation and allow planting to rehabilitate areas that have been disturbed.

The exact limits of the floodplains and associated buffers need to be defined prior to final approval of development, by environmental study and in consultation with MNR and the Lake Simcoe Region Conservation Authority (LSRCA).

The following requirements pertain to the SWM facilities:

- All facilities must conform to municipal standards, Conservation Authority and MOE design guidelines.
- SWM facilities must provide quantity control for the 100 year storm and an "Enhanced" level of quality control.
- SWM facilities (and the supporting drainage design) must give due consideration to environmental impacts with respect to location, outfall, buffering of existing surface water features, etc.
- The land owner's group (described in Section 6.6) for each service area will be responsible for all necessary design approvals and construction.
- Development is permitted to proceed on individual parcels provided the infrastructure is planned for the service area. The approved design may include phasing of the major works.
- For communal systems servicing more than one land parcel, the municipality will assume ownership and become the operating authority of the SWM facility at the time it goes into service.
- The municipality may require financial securities for the works to ensure their completion.
- The possibility of providing service to existing developed areas shall be incorporated into the design concepts where appropriate and as required by the municipality.
- All SWM facilities are to be located in separate blocks dedicated to the municipality under the appropriate planning process.

6.1.2 Construction and Maintenance Considerations

Construction of lot level and conveyance SWM controls is generally completed in conjunction with municipal servicing and building construction. If properly designed and built they do not significantly increase the cost of servicing and building. Maintenance of lot level and conveyance SWM controls consists mainly of routine inspections, grass cutting and sediment removal. The cost of this maintenance work is difficult to establish. It is not considered to be large in comparison to other maintenance activities such as snow removal or infrastructure maintenance.

Construction of end of collection system SWM controls generally precede or coincide with municipal servicing. The cost of constructing end of collection system SWM controls varies greatly depending on the type of control and location.

6.2 SEWAGE WORKS

The preferred solution for providing sewage treatment and disposal is communal treatment facilities with subsurface disposal or direct discharge to surface water.

The following requirements pertain to the communal sewage works:

- Sewage shall be collected by conventional gravity sewers draining to pumping stations which convey the sewage to a central sewage treatment plant within each service area.
- Where possible a separate greywater collection, treatment and reuse system is to be utilized.
- Sewage treatment plants shall be located to provide adequate buffering to adjoining residential areas as required by provincial guidelines.
- Sewage treatment facilities shall employ advanced treatment to achieve high quality effluent that meets or exceeds provincial requirements considering the receiver and associated environments.
- Effluent disposal by surface water discharge must be appropriately designed with consideration to water depth, currents, water quality and environmental impact (construction and long term).
- Effluent disposal by sub-surface systems must be appropriately designed for the soil and ground water conditions.
- Sub-surface systems shall be dispersed throughout the service area and are to be located in areas with most favourable soil and groundwater conditions.
- The lands containing the sub-surface systems are not to be considered park land under the meaning of the Planning Act however are to be open space areas integrated throughout the development.
- Sub-surface disposal areas shall include a 50% reserve area for long term replacement purposes.
- Each land parcel within each service area shall provide its own sub-surface disposal area for its own development purposes unless otherwise agreed by the land owners group.

6.3 WATER WORKS

The preferred solution for providing water supply, treatment and distribution is communal facilities with ground water or surface water supplies.

The following requirements pertain to the communal water works:

- Water supplied to communal systems shall be from ground water or surface sources as determined during Phase 3 of the Class EA process.
- Ground water supply shall be proven through construction of test wells and shall be sufficient to supply the maximum day demand for the service area.
- Intakes for a surface water supply shall be located with full consideration of to water depth, currents, raw water quality and environmental impact (construction and long term).
- The required well head or intake protection zone shall be established for source protection as part of the planning and design process.
- The treatment facility shall be designed to provide high quality potable water in accordance with current legislation and design guidelines.
- Water systems shall include sufficient storage, pumping and distribution capacity for fire protection to a level determined by the municipality.
- Water shall be distributed throughout the service area ensuring full circulation.
- All service connections shall be metered.
- Water conservation measures are to be employed at every opportunity.

6.4 TRANSPORTATION

The following requirements pertain to new roads identified to access the proposed service areas and associated intersection improvement works:

- New roads to service the highway commercial areas east and west of County Road 44 (Collector C) shall be 5-lane roads with 2 lanes per direction and a centre left turn lane.
- County Road 44 extension from Highway 12 to the south shall a 4-lane road with 2 lanes per direction.
- A new road – Collector R shall be a 2-lane road with one lane per direction to serve the residential area R1. The road shall line up with Balsam Road and connect Concession Road 11

with Highway 12. The current intersection of Concession Road 11 with Highway 12 shall be eliminated.

- The intersection of Highway 12 and County Road 44 shall be a 4-leg intersection have the following lane configuration:
  - north approach (County Road 44): two left turn lanes, two through lanes and two channellized right lanes;
  - south approach (County Road 44 extension): one left turn lane, one through lane and one sharded through-right lane;
  - east approach (Highway 12): one left turn lane, two through lanes and one right turn lane; and
  - west approach (Highway 12): three left turn lanes, two through lanes and one shared through-right lane.
- The intersection of Highway 12 and Balsam Road/Collector R shall be a 4-leg signalized intersection and have the following lane configuration:
  - north approach (Collector R): one left turn lane and one shared through-right lane;
  - south approach (Balsam Road): one left turn lane, one shared through-right lane;
  - east approach (Highway 12): one left turn lane, two through lanes and one shared through-right turn lane; and
  - west approach (Highway 12): one left turn lane, two through lanes and one shared through-right lane.
- The intersection of County Road 44 and Collector C shall be a 4-leg signalized intersection and have the following lane configuration:
  - north approach (County Road 44): one left turn lane, two through lanes and one shared through-right lane;
  - south approach (County Road 44): two left turn lanes, three through lanes and one right lane;
  - east approach (Collector C): two left turn lanes, one shared through-right lane; and
  - west approach (Collector C): one left turn lane, one through lane and one right lane.

6.5 SECONDARY PLANS

Section 4.1.3.1 of the Ramara Official Plan sets out the policies for the preparation of Secondary Plans in the villages. Section 4.2.1 sets out the policies for the preparation of a Secondary Plan for the Rama Road Corridor.

4.1.3.3 Secondary Plans for the Villages will generally establish:

- the development boundary of the settlement area.
- land use designations specific to the settlement area.
- the existing or opportunity for municipal or communal services.
- consideration of well protection areas.
- subwatershed limits and local drainage boundaries and patterns.
- location of central stormwater management systems and facilities.
- the existing and appropriate future location of community, institutional, recreation and cultural uses such as schools, libraries, parks, day nurseries.
- the extent of natural area features and functions including groundwater recharge and discharge areas to be protected and conserved.
- the transportation network including the local road network, arterial and collector road systems, all-season walkways, bicycle paths, trails, and transit.
- urban design guidelines.
- monitoring protocols for surface and groundwater quantity and quality, natural area features and functions, and stormwater management.

4.2.1.2 The Secondary Plan or Secondary Plans will generally establish:

- the development boundary of the special development area and the settlement area.

- land use designations specific to the corridor and the settlement area.
- natural area features and functions including groundwater recharge and discharge areas that are to be protected and conserved.
- natural resource constraint areas.
- the transportation network including the local road network, arterial and collector road systems, all-season walkways, bicycle paths, trails, and transit.
- consideration of well protection areas.
- subwatershed limits and local drainage boundaries and patterns.
- location of central stormwater management systems and facilities.
- opportunities for municipal or communal water supply and wastewater treatment services.
- urban design guidelines.
- monitoring protocols for surface and groundwater quality and quantity, natural area features and functions, and stormwater management.

Most of the background for these Secondary Plans is contained in the Master Servicing Plan.

When the Master Servicing Plan is adopted by the Township, work will begin on the preparation of these Secondary Plans.

The Secondary Plans will be subject to open houses and public meetings, consultation with land owners and residents, and will be adopted by the Township as amendments to the Ramara Official Plan.

6.6 SERVICE AREA AND LAND OWNER'S GROUPS

Each service area is comprised of a number of individual land parcels. It is anticipated that the owners of these land parcels in each service area will create a "land owner's group" to share in the costs of the subsequent planning, design and construction of the communal water and sewage systems and any other works (stormwater management, traffic, parks, etc.) providing service to multiple properties within the service area.

The land owners group will retain, as required, a lead consultant and/or trustee to develop an appropriate cost sharing agreement including provisions for "front ending" when individual land owners are not prepared to participate in the group from the outset. The municipality will not be a party to the cost sharing agreement.

The municipality will ensure that conditions of approval are imposed on development applications within each service area that obliges each land owner to join the land owners group and participate in cost sharing of common services agreement.

7.0 PUBLIC AND AGENCY COMMENTS

Comments were requested from residents, public agencies and identified stakeholders in the Notice of Commencement and at the Public Information Centre. Comments received (in italics) and an explanation of how the MSP addresses each comment are summarized as follows:

7.1 NOTICE OF COMMENCEMENT

Simcoe Muskoka Catholic District School Board

- *Interested in road improvements and possible effects on bus routes.*
  - Section 6.4 of the MSP addresses transportation and proposed new roads to improve travel. No major existing roads are being altered and effects on bus routes will be minimal.

Transport Canada Marine

- *Advised of provisions of Navigable Waters Act.*
  - Implementation of the MSP requires conformance with all applicable municipal, Provincial and Federal regulations.

7121 & 7207 Benson Road

- *The planning rationale of the MSP should account for Casino Rama and First Nations land.*
  - First Nations land is not under the jurisdiction of the Township and is therefore not included in the study.

- *Full municipal servicing of lands northeast of the First Nations land is not feasible due to distance and crossing of First Nations land. Suggest onsite subsurface disposal.*
  - The latest available background information was used and "ground-truthed" by the study team.

3 respondents asked if service would be provided to existing residents.
- The MSP requires that potential servicing of existing residents should be reviewed as individual developments proceed.

18 respondents asked to be added to the contact list.

7.2 PUBLIC INFORMATION CENTRE

Lake Simcoe Region Conservation Authority

- *Proposed development must meet LSRCA Watershed Development polices. Terms of reference for future studies supporting development should be reviewed by LSRCA.*
  - The MSP requires all development proposals to meet applicable LSRCA guidelines.

Transport Canada Marine

- *Advised of provisions of Navigable Waters Act.*
  - Implementation of the MSP requires conformance with all applicable municipal, Provincial and Federal regulations.

North half Lot 27, Concession 13

- *A development is being proposed for the subject property which would utilise an on site communal sewage treatment facility.*
  - Communal sewage treatment is the recommended solution of the MSP. Servicing of the subject property would have to conform with the recommendations of the MSP, including but not limited to the recommendations with respect to service area and land owner groups.

Respondent

- *The MSP should include servicing of existing properties.*
  - The MSP requires that potential servicing of existing development should be reviewed as individual developments proceed.
- *The Township should undertake a ground water quality in the Study Area.*
  - The MSP requires full hydrogeological studies of water quality and quantity as development proceeds.

Ministry of Transportation of Ontario

- *The MSP should address impacts of proposed development on Highway 12.*
  - The MSP addresses transportation at a scope appropriate for a Master Plan, further detailed studies will be required for any proposed development.

Respondent

- *There are inconsistencies in the Study Area boundaries versus the natural watershed boundaries.*
  - The limits of the Study Area are defined by assessment parcels, Official Plan boundaries and watershed boundaries all which do not all strictly coincide.
- *Why are certain areas identified as restricted development?*
  - Restricted development areas related to Provincially Significant Wetlands or agriculture and wetlands areas as identified in the Official Plan and the Township Zoning By-law.
- *Why are out dated photos used?*
  - The photos used are the most recent available. The information shown on the photos was ground truthed by the environmental consultant.
- *Why was the wetland area west of the Uptergrove School not recognized?*
  - This area is not an identified wetland in Provincial, County or municipal documents and is not classified as a wetland by the environmental consultant.

Respondent

- *Communal servicing will make development unfeasible. Suggested that development continue on private services with communal servicing phased in.*
  - The MSP recognized issues with implementation during the evaluation of servicing alternatives, but private servicing doesn't allow intensification as per Provincial planning policies and private sewage disposal systems can result in negative ground and surface water impacts.

Part Lot 24, Concession 9-10

- *A residential subdivision on the subject property is proposed to proceed on private services. The development should proceed as the property is in the settlement area and is appropriate under the Official Plan and Zoning By-law.*
  - The Official Plan requires secondary plans and appropriate servicing studies to be completed, and these studies will have to conform with the recommendation of the MSP, which does not consider private servicing to be a viable option. Although the subject property is outside of the identified service areas contemplated for residential development the proposal could proceed as per the recommendations of the MSP i.e. communal servicing.

Lots 29 & 30 Concession 12

- *A proposed four season resort and associated facilities are proposed on the subject property, to be serviced by communal sewage facilities. Suggested that point discharge to Lake Couchiching be considered for effluent disposal.*
  - Point discharge of sewage effluent is considered appropriate in the MSP if supporting studies are favourable and proper approvals can be obtained.

Respondent

- *When will the MSP be adopted and how will the Township deal with development proposals that were presented prior to commencement of the MSP?*

- The process for adoption of the MSP is described in the report. Unless approvals were obtained prior to commencement of the MSP all developments must be in accordance with the MSP and subsequent secondary plans.

4 respondents acknowledged the information but required no specific response.

8.0 MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

The completion of the Master Servicing Plan will satisfy Phase 1 and 2 of the Municipal Class EA. Phases 3 to 5 will be the responsibility of the land owner's group for each of the 11 service areas as described in Section 6.0.

Phase 3 of the Municipal Class EA requires the complete assessment of design alternatives for the water and sewer systems to provide service to each service area. This assessment shall include consideration of all available design alternatives and shall include all necessary environmental, geotechnical, hydrogeological and financial analysis to verify the preferred design alternative is appropriate.

The financial analysis shall verify the proposed sewage and water systems can be owned and operated by the municipality in a cost effective manner with due consideration to the applicable legislation and the need for sustainability.

8.1 COMMENTS ON THE MASTER PLAN AND NOTICE OF COMPLETION

This Master Servicing Plan will be filed with the Township of Ramara and placed on public record for a period of 30 days following publication of a Notice of Completion in the Orillia Packet & Times. In accordance with the notice, the public and review agencies will be invited to further review the report and provide written comments to the following:

C.C. Tatham & Associates Ltd.
50 Andrew Street South Unit 202
Orillia, ON L3V 7T5
Attention: Tim Collingwood, P.Eng.

Township of Ramara
2297 Highway #12, P.O. Box 130
Brechin, ON L0K 1B0
Attention: Rick Bates, BAS, CET CAO/Clerk

8.2 REQUEST FOR PART II ORDER

If concerns arise regarding this study, which cannot be resolved in discussion with the Township or the Project Team, the public can 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 Part II Order), which addresses individual environmental assessments. Requests are to be submitted to the Minister, and copied to the Township before the end of the 30 day review period. The Minister determines whether or not a Part II Order is appropriate and the Minister's decision becomes final.

If there is no request for a Part II Order within the 30 day period, the Township may proceed to implement the projects identified in the Master Servicing Plan.

8.3 APPROVALS AND IMPLEMENTATION

In developing alternative design concepts for all preferred servicing solutions the following general requirements are to be recognized:

- All facilities must conform to municipal standards, Conservation Authority, MTO and MOE design guidelines.
- The land owners group for each service area will be responsible for all necessary design approvals and construction.
- Development is permitted to proceed on individual parcels provided the infrastructure is planned for the service area. The approved design may include phasing of the major works.

- For communal systems servicing more than one land parcel, the municipality will assume ownership and become the operating authority of the stormwater management, sewage and water works at the time they go into service.
- The municipality may require financial securities for the works to ensure their completion and continued satisfactory operation.
- The financial analysis for the communal systems shall derive an appropriate rate to be charged for sewage and water service.
- The land owners group will be responsible for shortfalls in operating revenue during the initial years of operation when occupancy is insufficient and revenue is insufficient to offset the operating costs.
- The possibility of providing service to existing developed areas shall be incorporated into the design concepts where appropriate and as required by the municipality.
- The minimum size of development to be served by a single water or sewage system is 200 residential lots, or the equivalent design flow in the case of commercial properties.
- All communal stormwater management, sewage and water facilities serving more than one land parcel are to be located in separate blocks dedicated to the municipality under the appropriate planning process.

9.0 CONCLUSION

The Township of Ramara has proceeded under the Class Environmental Assessment Process to establish a Master Servicing Plan for the Atherley / Uptergrove Secondary Plan Area and Rama Road Corridor.

The preferred servicing solution for water supply and treatment and sewage collection, treatment and disposal is communal servicing. Water supply can be from ground water or surface water. Advanced sewage treatment should be provided, with sub-surface or surface water disposal, as is appropriate and approved.

Stormwater Management should be provided by centralized SWM facilities where appropriate based on existing topography and natural features. Otherwise stormwater management should be considered on a sight specific basis.

A network of collector roads and commercial service roads with appropriate intersections to existing arterial roads and highways has been proposed to service new development in the Study Area.

Service areas and land owner groups have been identified, as an appropriate means of implementing the preferred servicing solutions of the Master Servicing Plan.

MAPS

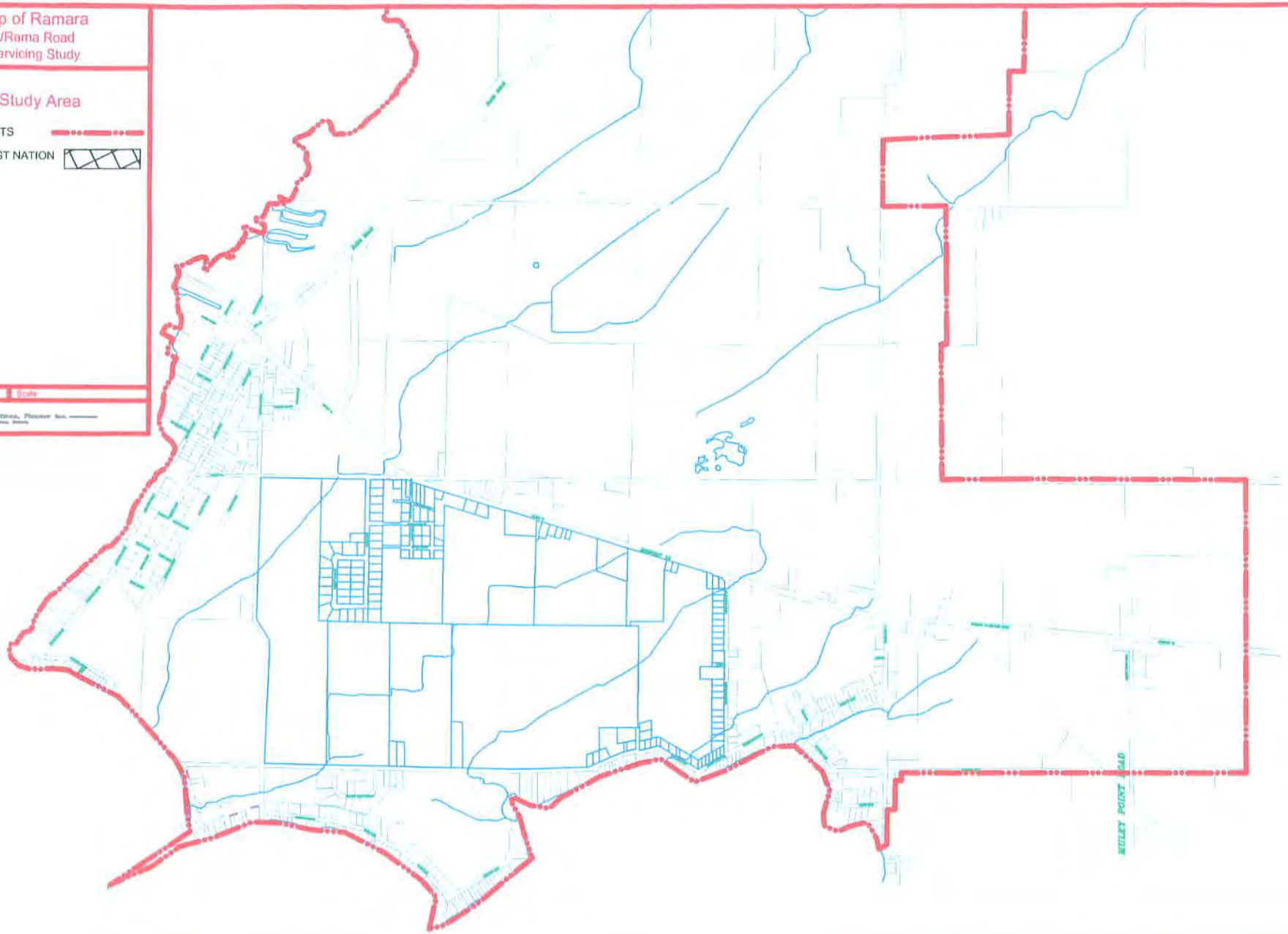
Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 1 - Study Area

STUDY AREA LIMITS

MNJIKANING FIRST NATION

Date: July 2008 Scale:



Township of Ramara
Atherley/Rama Road
Master Servicing Study

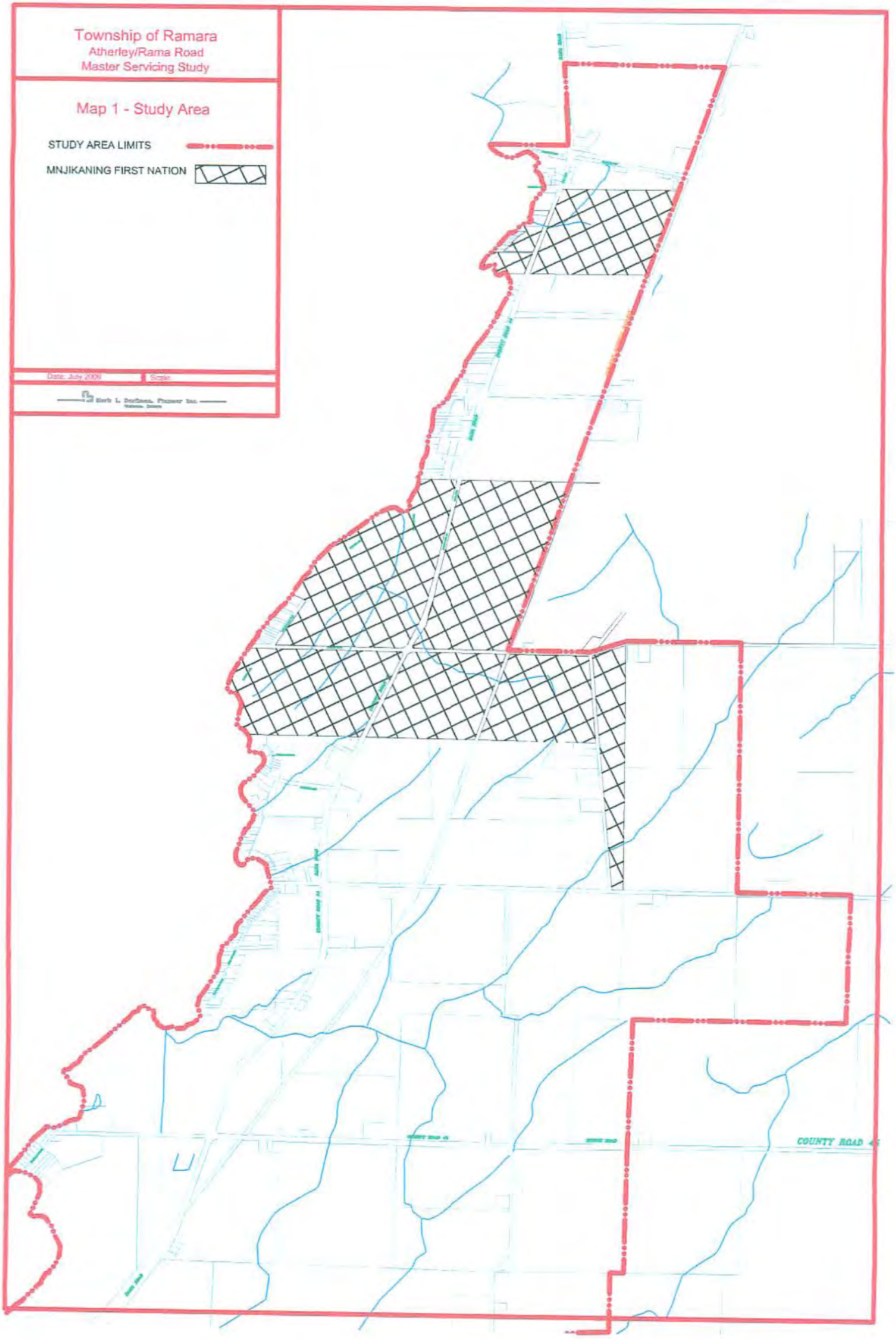
Map 1 - Study Area

STUDY AREA LIMITS

MNJIKANING FIRST NATION

Date: July 2009 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 2 - Land Use

STUDY AREA LIMITS

RESIDENTIAL CLUSTER

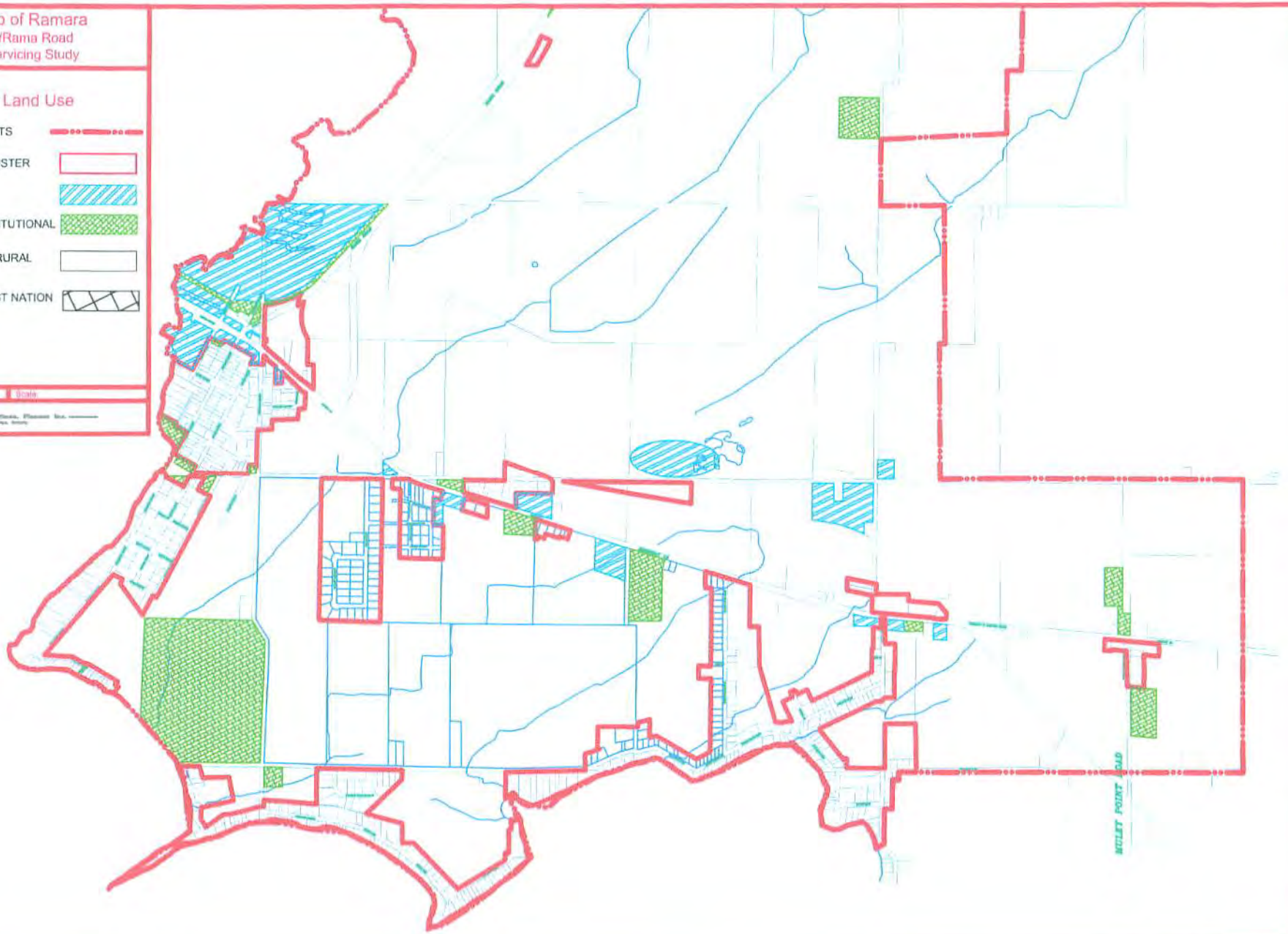
COMMERCIAL

PUBLIC AND INSTITUTIONAL

AGRICULTURAL, RURAL and VACANT

MNJIKANING FIRST NATION

Date: July 2008 | Scale:



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 2 - Land Use

STUDY AREA LIMITS

RESIDENTIAL CLUSTER

COMMERCIAL

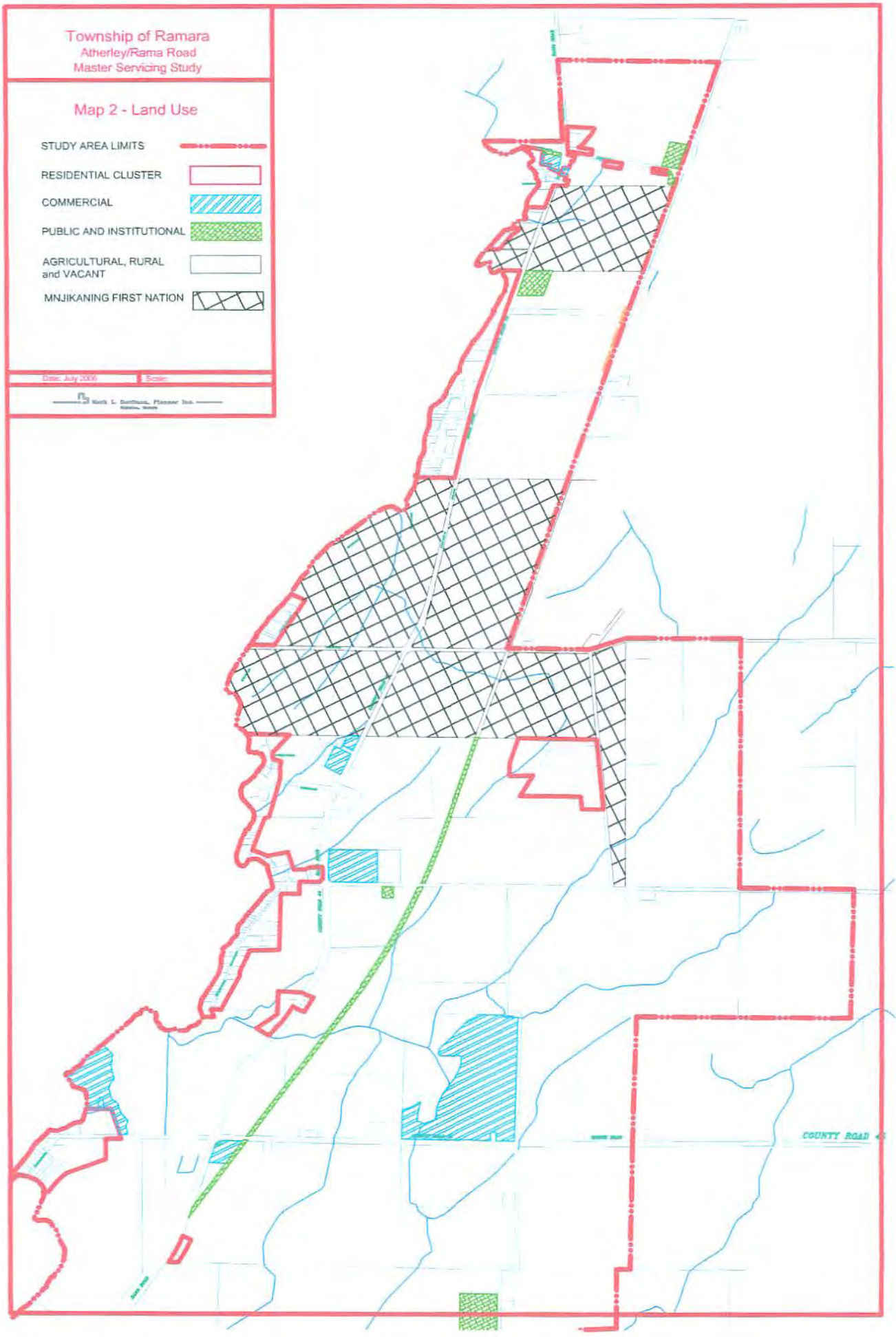
PUBLIC AND INSTITUTIONAL

AGRICULTURAL, RURAL and VACANT

MNJIKANING FIRST NATION

Date: July 2009 Scale:

Mark L. Dorfman, Planner Inc.



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 3 - Official Plan Designations

- STUDY AREA LIMITS
- NATURAL AREA PROTECTION
- AGRICULTURE
- RURAL
- VILLAGE
- HAMLET
- SHORELINE RESIDENTIAL
- INDUSTRIAL
- DESTINATION COMMERCIAL
- HIGHWAY COMMERCIAL

Date: July 2006 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario

Township of Ramara
Atherley/Rama Road
Master Servicing Study

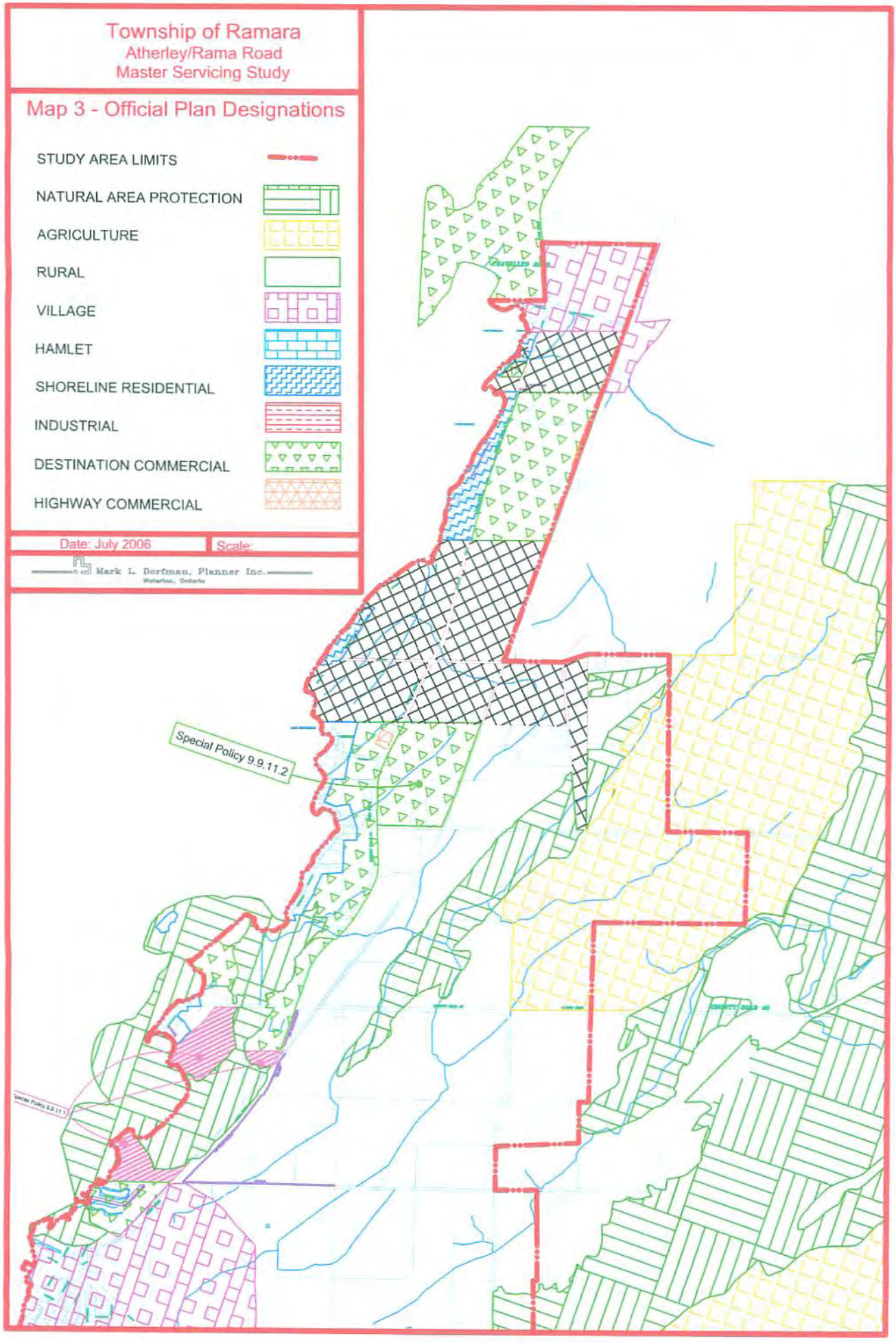
Map 3 - Official Plan Designations

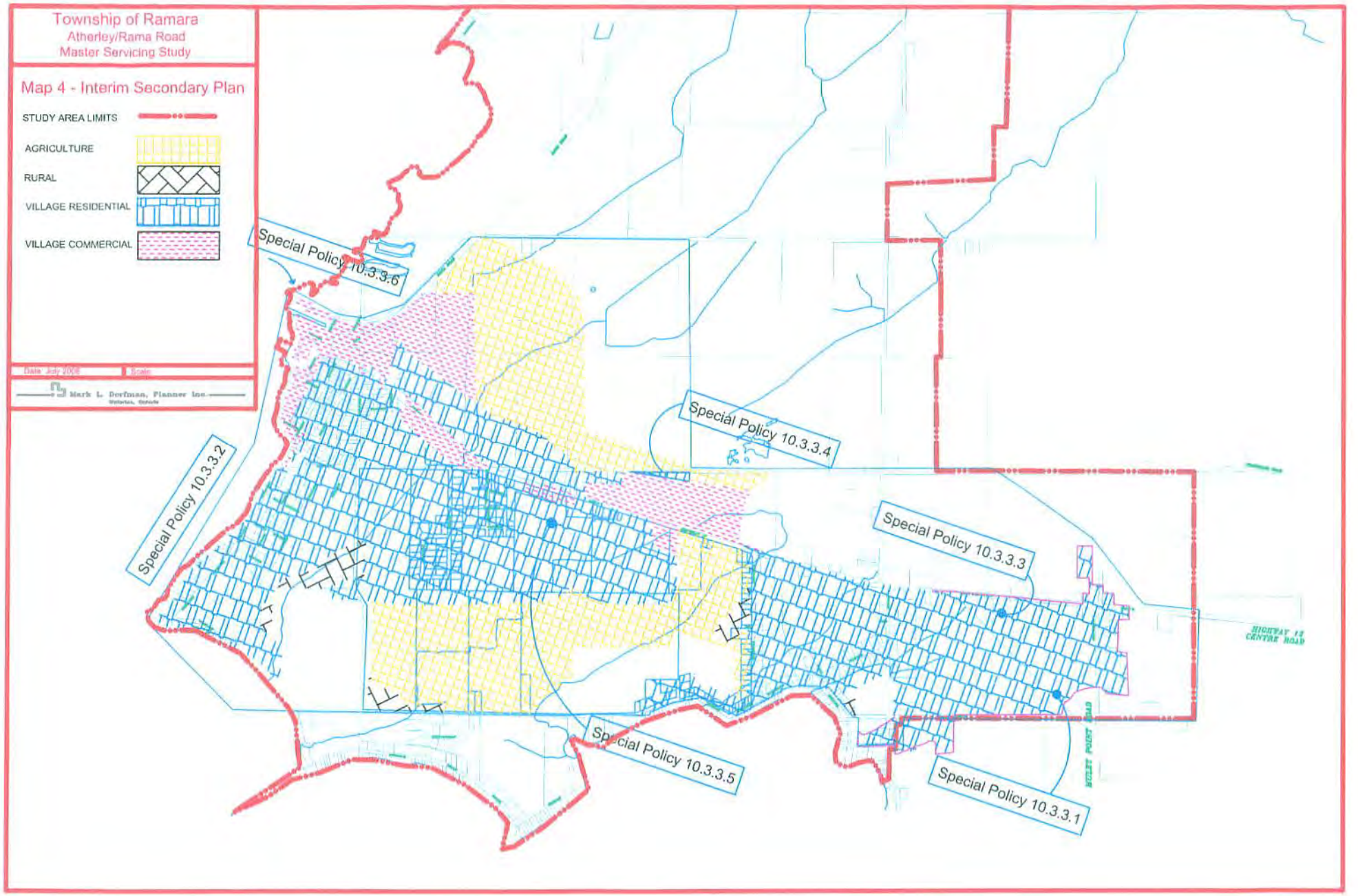
- STUDY AREA LIMITS
- NATURAL AREA PROTECTION
- AGRICULTURE
- RURAL
- VILLAGE
- HAMLET
- SHORELINE RESIDENTIAL
- INDUSTRIAL
- DESTINATION COMMERCIAL
- HIGHWAY COMMERCIAL

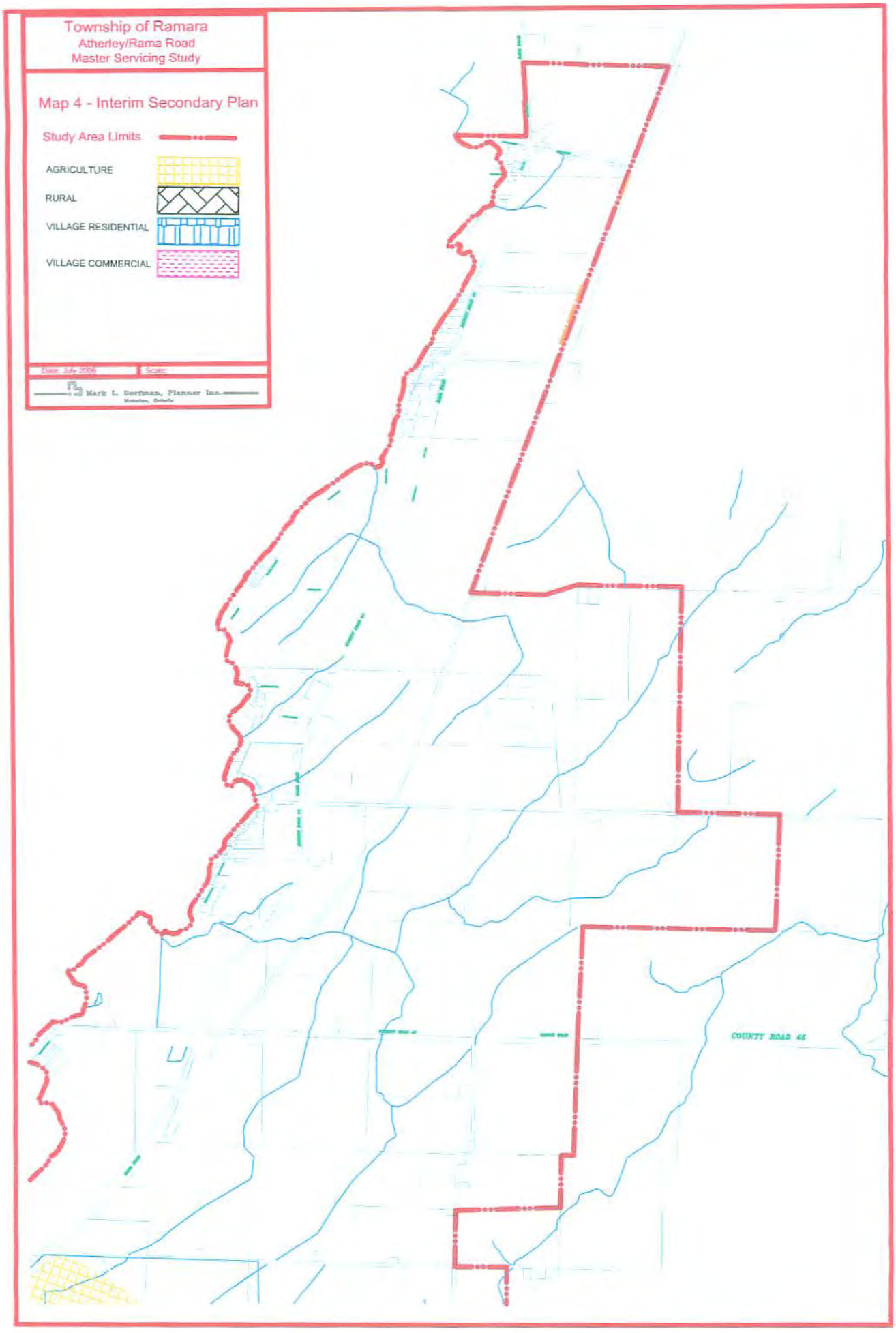
Date: July 2006

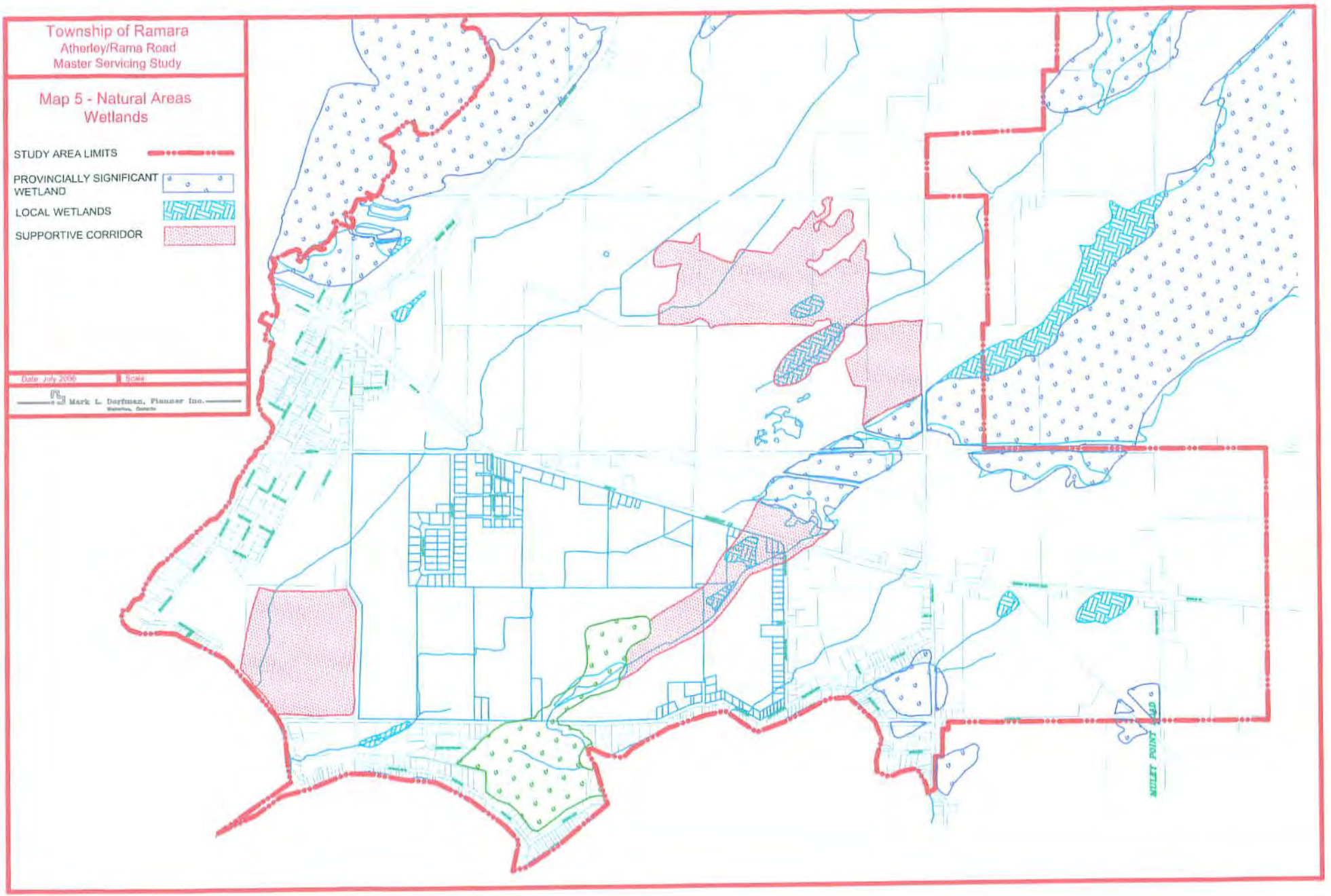
Scale:

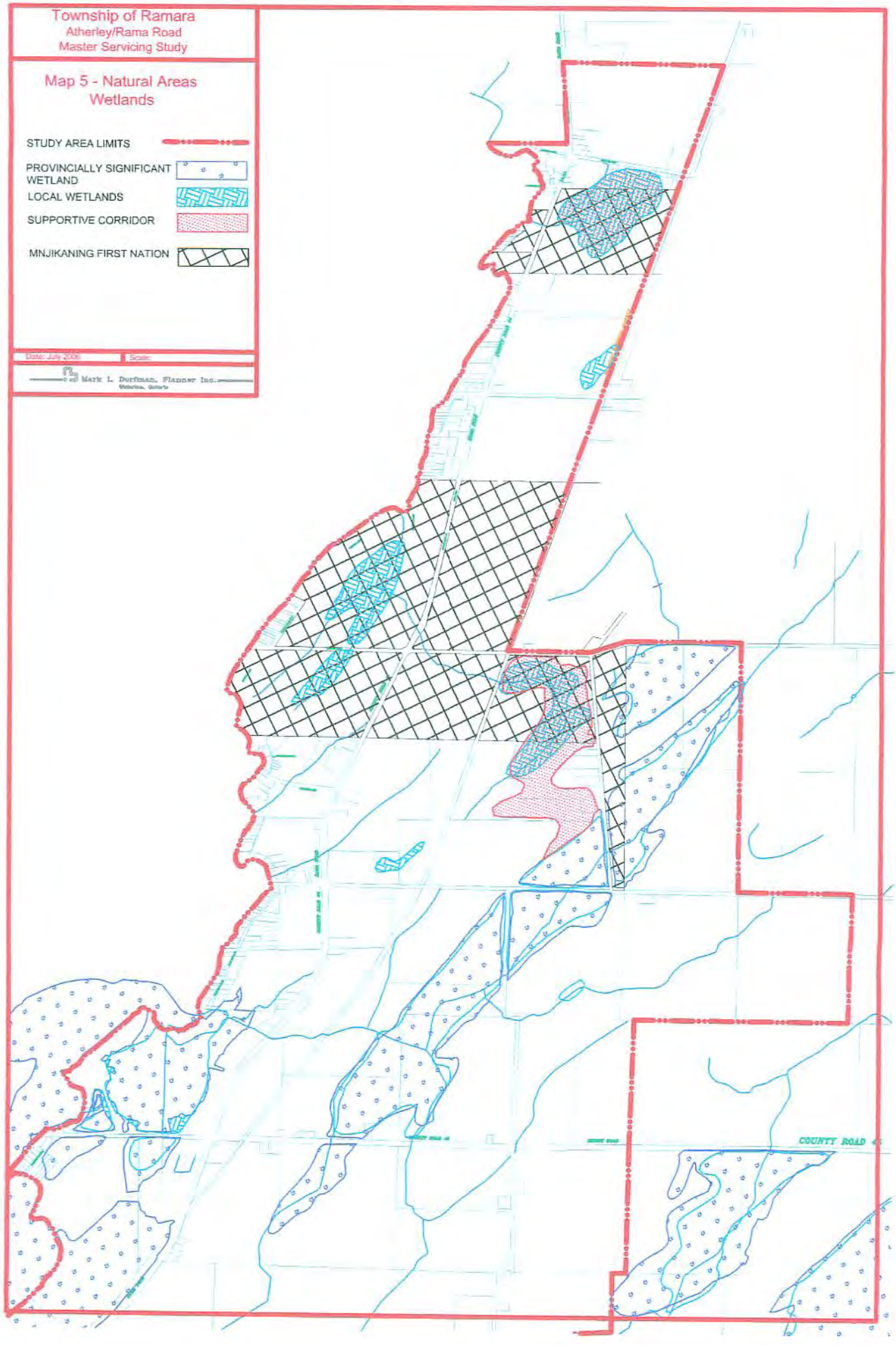
Mark L. Dorfman, Planner Inc.
Waterloo, Ontario

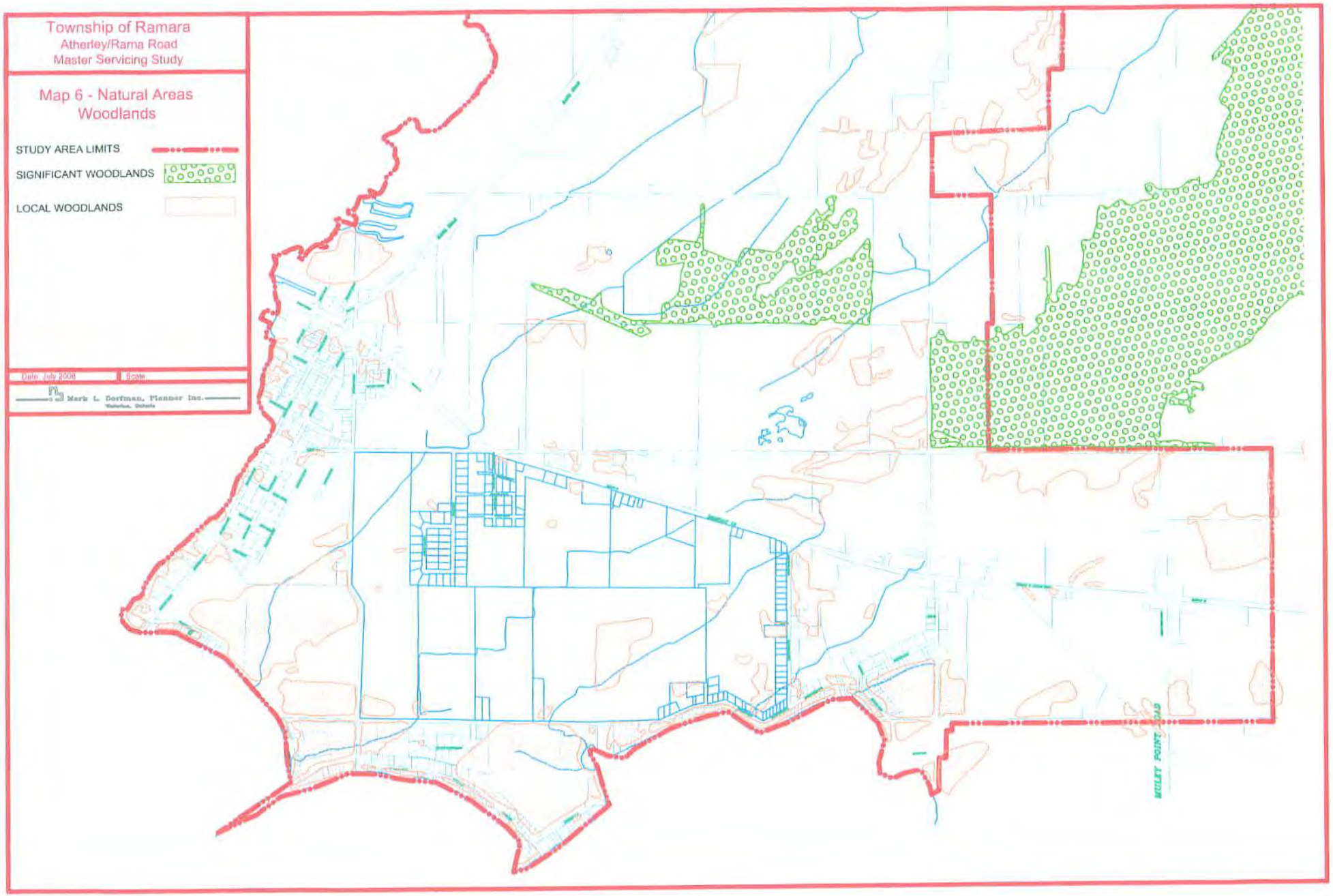



Township of Ramara
Atherley/Rama Road
Master Servicing Study
Map 4 - Interim Secondary Plan
STUDY AREA LIMITS
AGRICULTURE
RURAL
VILLAGE RESIDENTIAL
VILLAGE COMMERCIAL
Date: July 2008
Scale:
Mark L. Dorfman, Planner Inc.
Special Policy 10.3.3.6
Special Policy 10.3.3.2
Special Policy 10.3.3.4
Special Policy 10.3.3.3
Special Policy 10.3.3.5
Special Policy 10.3.3.1
HIGHWAY 12
CENTRE ROAD
WEST POINT ROAD


Township of Ramara
Atherley/Rama Road
Master Servicing Study
Map 4 - Interim Secondary Plan
Study Area Limits
AGRICULTURE
RURAL
VILLAGE RESIDENTIAL
VILLAGE COMMERCIAL
Date: July 2005
Scale:
Mark L. Dorfman, Planner Inc.
COUNTY ROAD 45


Township of Ramara
Atherley/Rama Road
Master Servicing Study
Map 5 - Natural Areas
Wetlands
STUDY AREA LIMITS
PROVINCIALLY SIGNIFICANT WETLAND
LOCAL WETLANDS
SUPPORTIVE CORRIDOR
Date: July 2006
Scale:
Mark L. Dorfman, Planner Inc.
Waterloo, Ontario
MOLET POINT ROAD


Township of Ramara
Atherley/Rama Road
Master Servicing Study
Map 5 - Natural Areas
Wetlands
STUDY AREA LIMITS
PROVINCIALLY SIGNIFICANT WETLAND
LOCAL WETLANDS
SUPPORTIVE CORRIDOR
MNJIKANING FIRST NATION
Date: July 2009
Scale:
Mark L. Dorfman, Planner Inc.
COUNTY ROAD 47


Township of Ramara
Atherley/Rama Road
Master Servicing Study
Map 6 - Natural Areas
Woodlands
STUDY AREA LIMITS
SIGNIFICANT WOODLANDS
LOCAL WOODLANDS
Date: July 2008
Scale
Mark L. Dorfman, Planner Inc.
WILEY POINT ROAD

Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 6 - Natural Areas Woodlands

STUDY AREA LIMITS

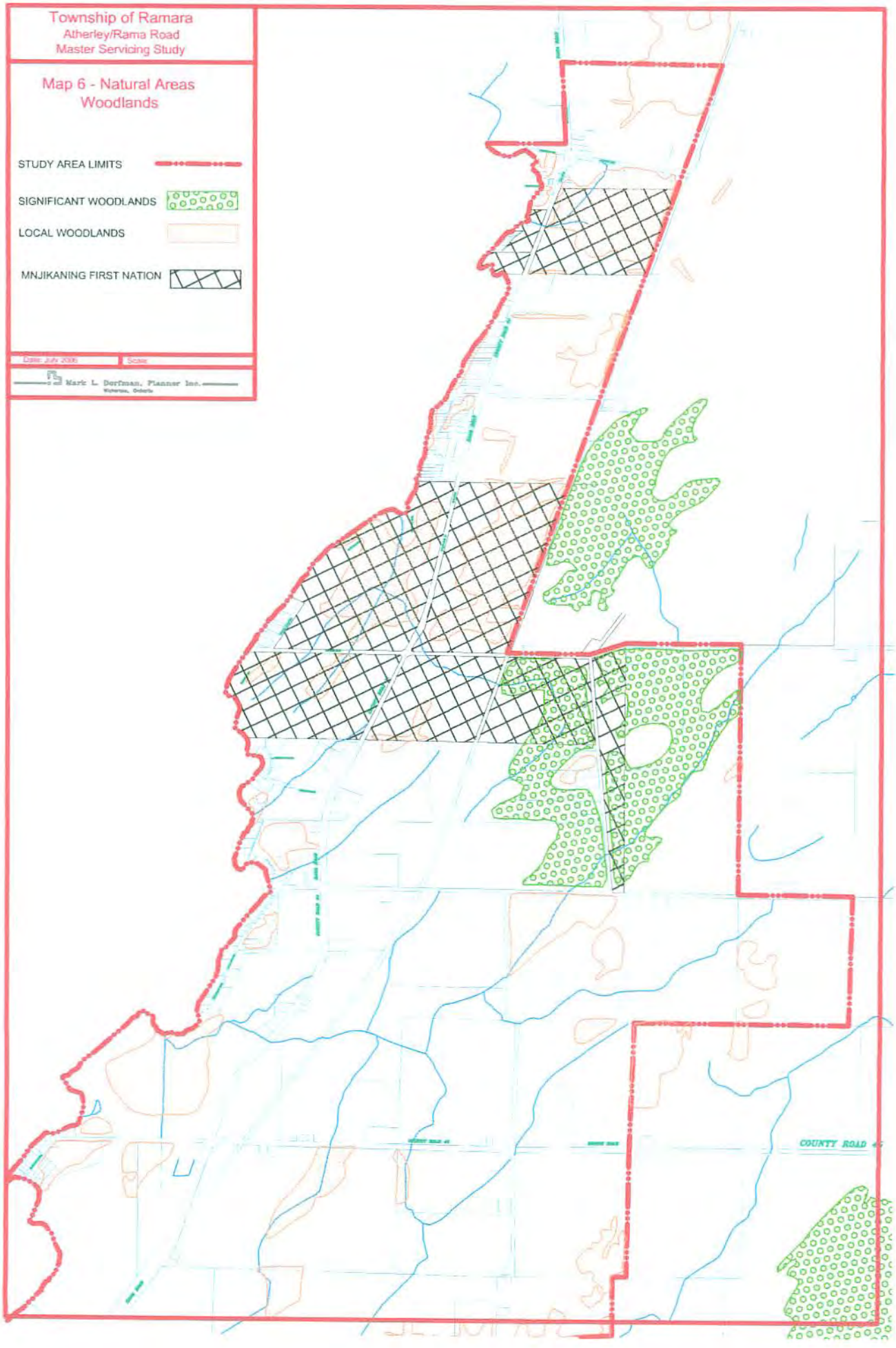
SIGNIFICANT WOODLANDS

LOCAL WOODLANDS

MNJIKANING FIRST NATION

Date: July 2006 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 7 - Subdrainage Areas

STUDY AREA LIMIT

SIGNIFICANT WOODLANDS

PROVINCIALLY SIGNIFICANT WETLANDS

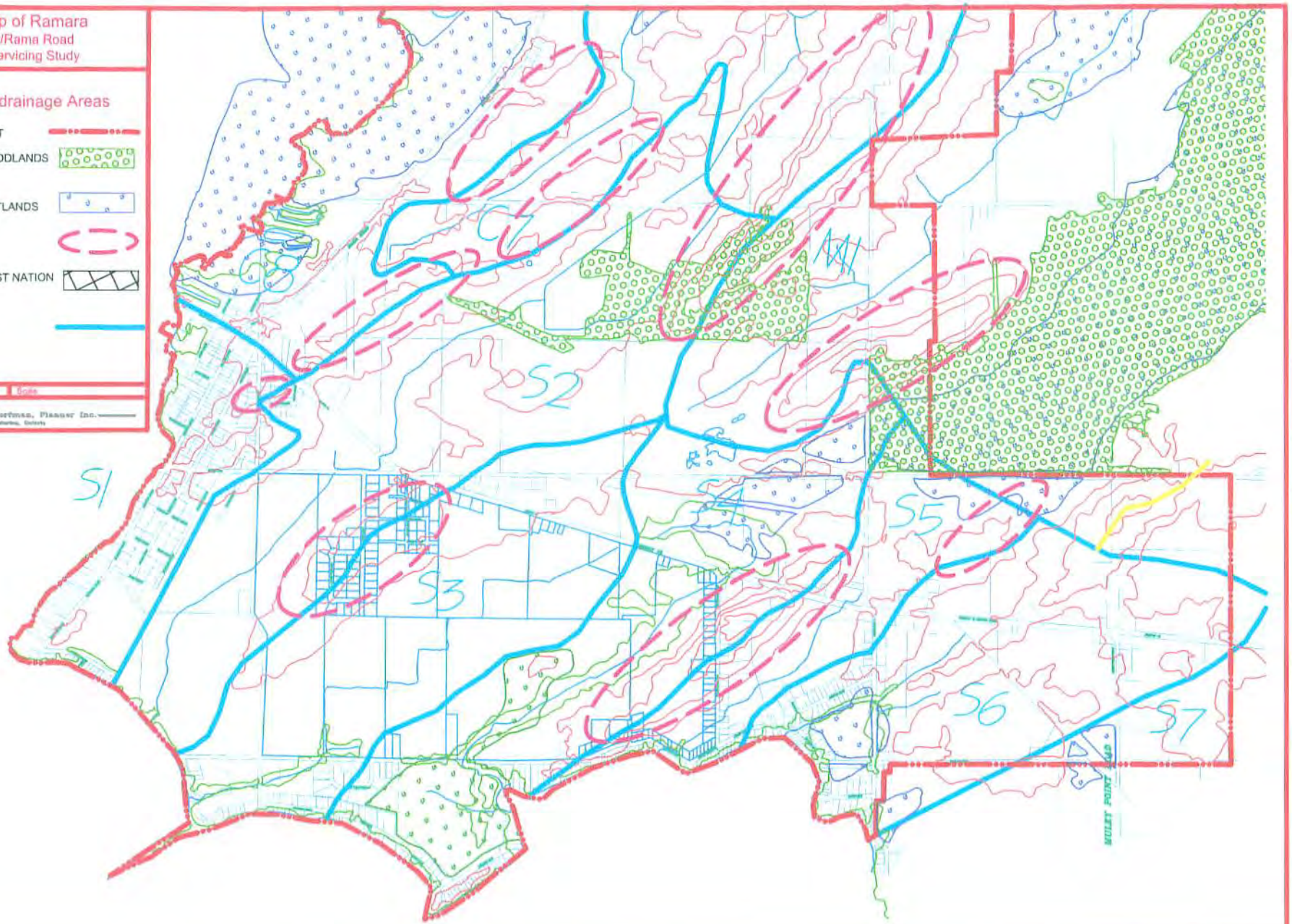
DRUMLINS

MNJIKANING FIRST NATION

SUBDRAINAGE BOUNDARY

Date July 2008 | Scale

Mark L. Dorfman, Planner Inc.



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 7- Subdrainage Areas

STUDY AREA LIMITS

SIGNIFICANT WOODLANDS

PROVINCIALLY SIGNFICANT WETLANDS

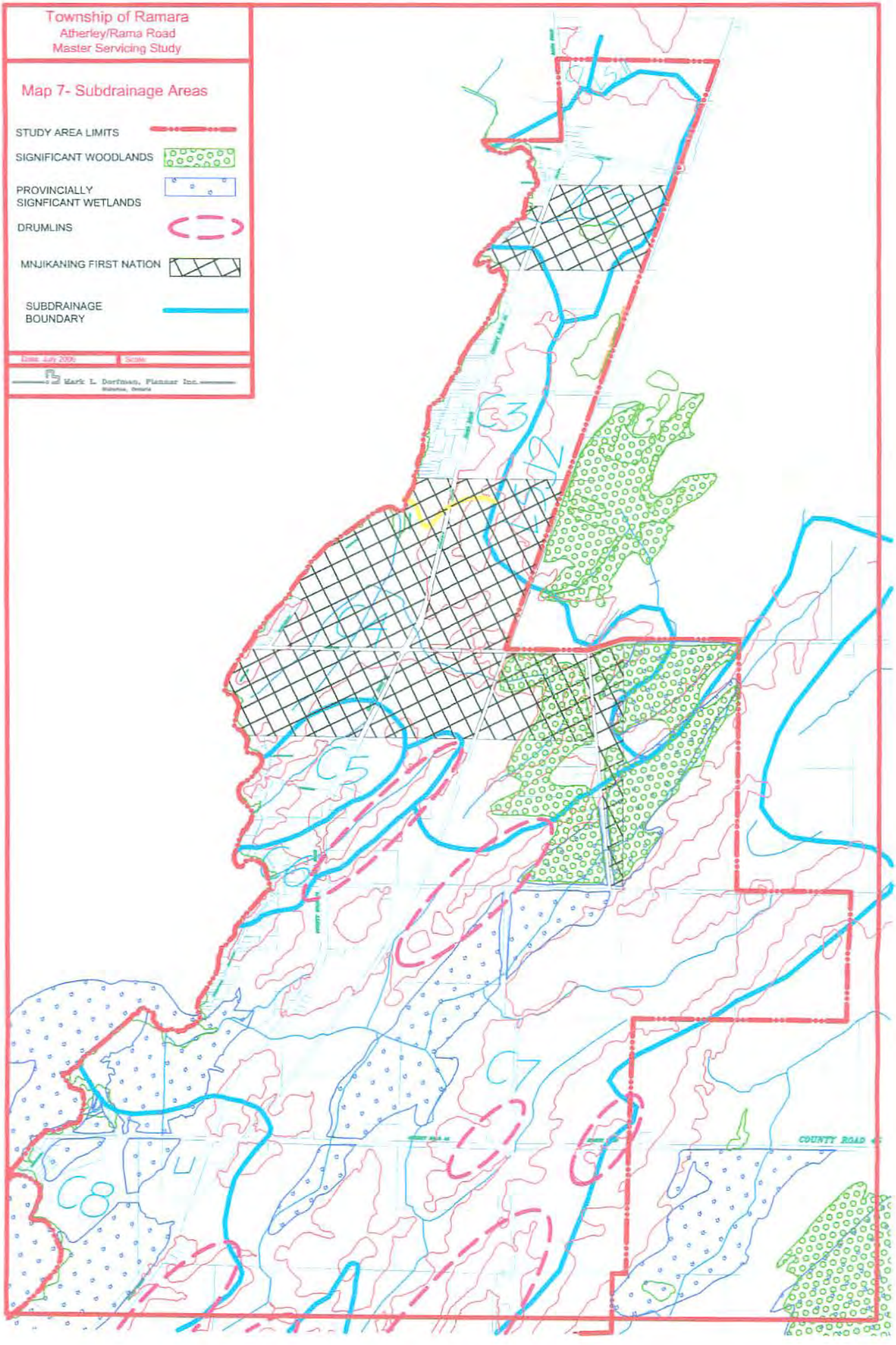
DRUMLINS

MNJIKANING FIRST NATION

SUBDRAINAGE BOUNDARY

Date: July 2006 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 8 - Soils

Study Area Limits

GOOD DRAINAGE

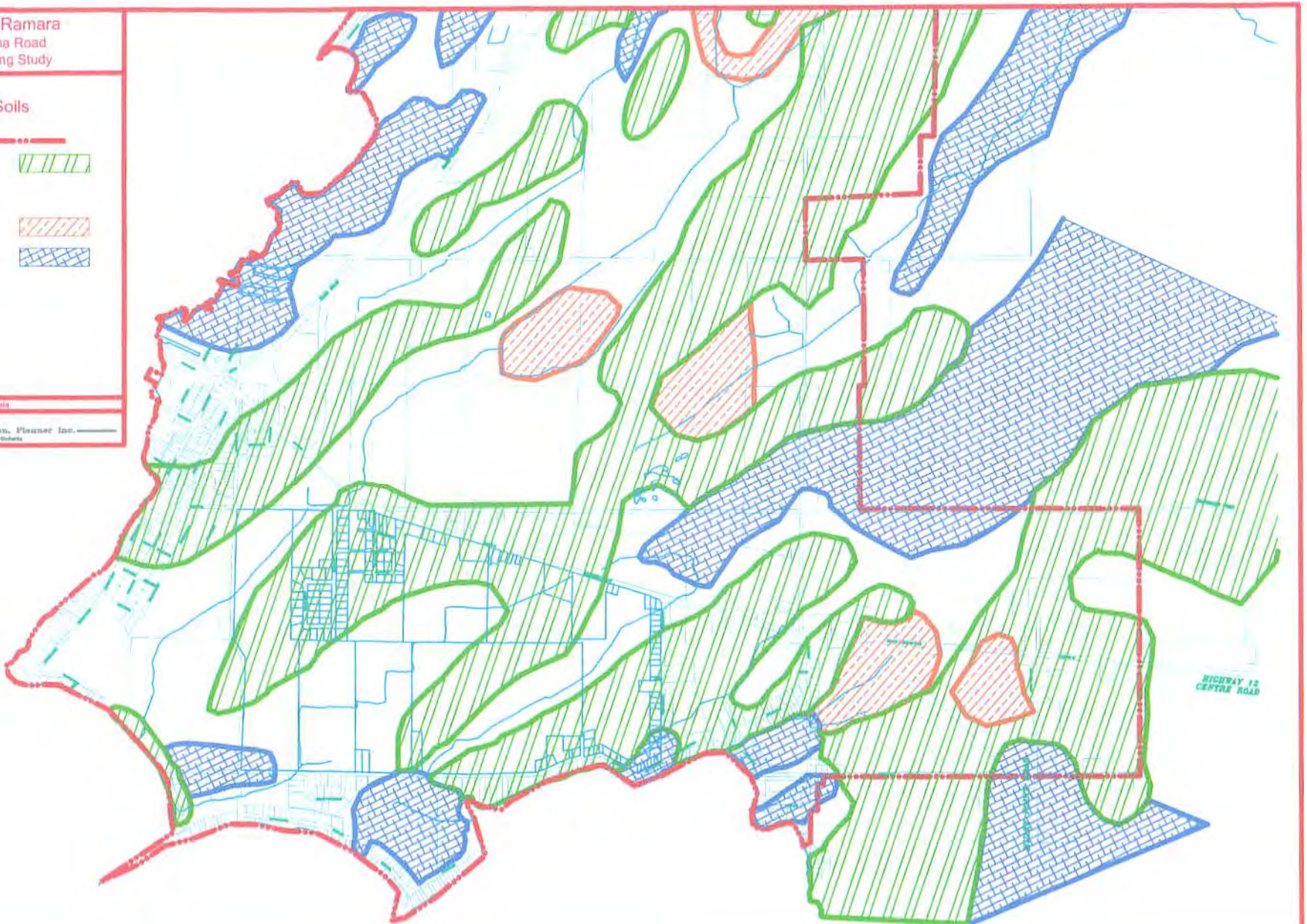
IMPERFECT DRAINAGE

POOR DRAINAGE

MUCK

Date: July 2008 | Scale

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

Map 8 - Soils

STUDY AREA LIMITS

GOOD DRAINAGE

IMPERFECT DRAINAGE

POOR DRAINAGE

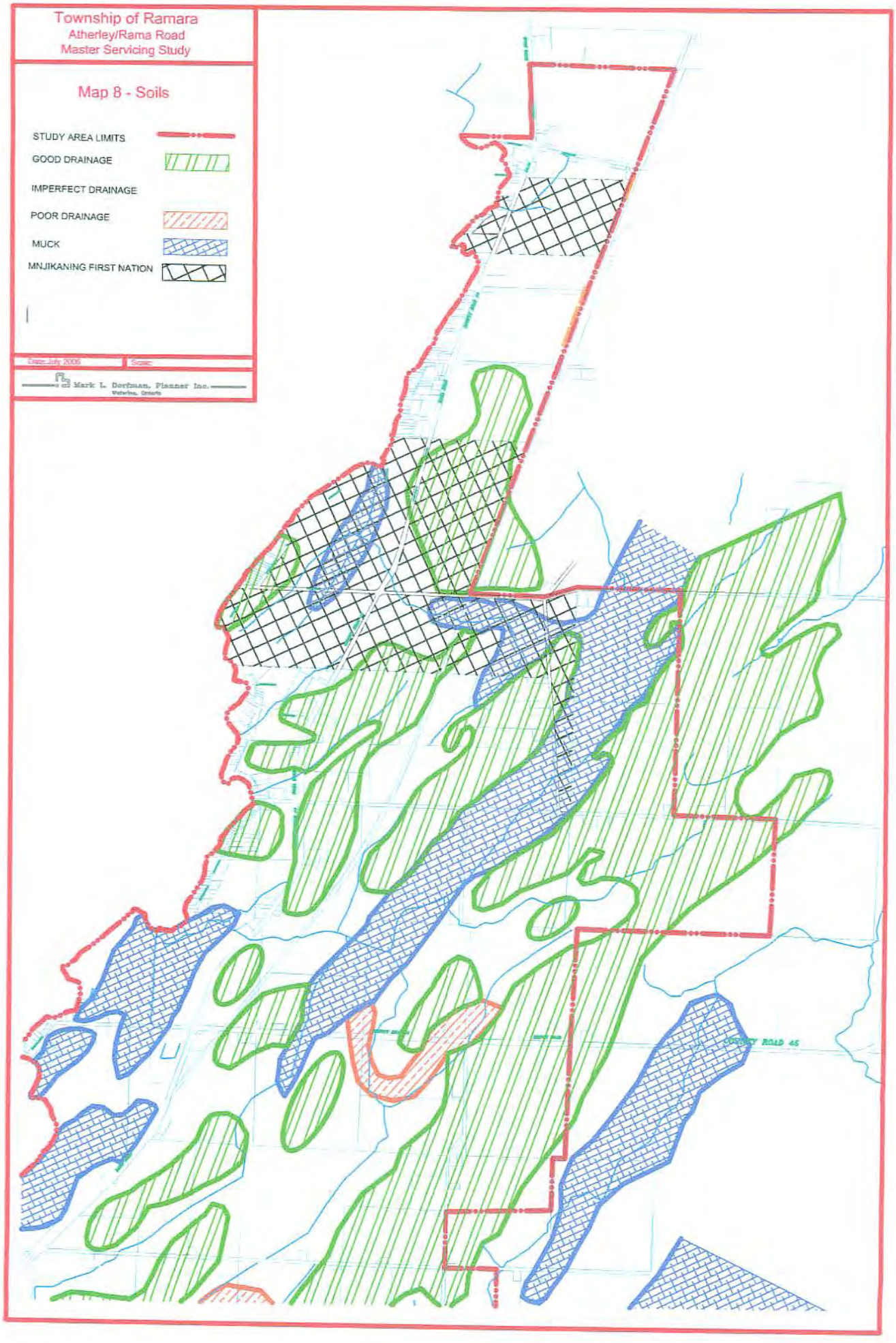
MUCK

MNJIKANING FIRST NATION

Date: July 2006

Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

MAP 9A
INDIVIDUAL SERVICING

Study Area Limits

DESTINATION COMMERCIAL

COMMERCIAL

RESTRICTED DEVELOPMENT AREAS

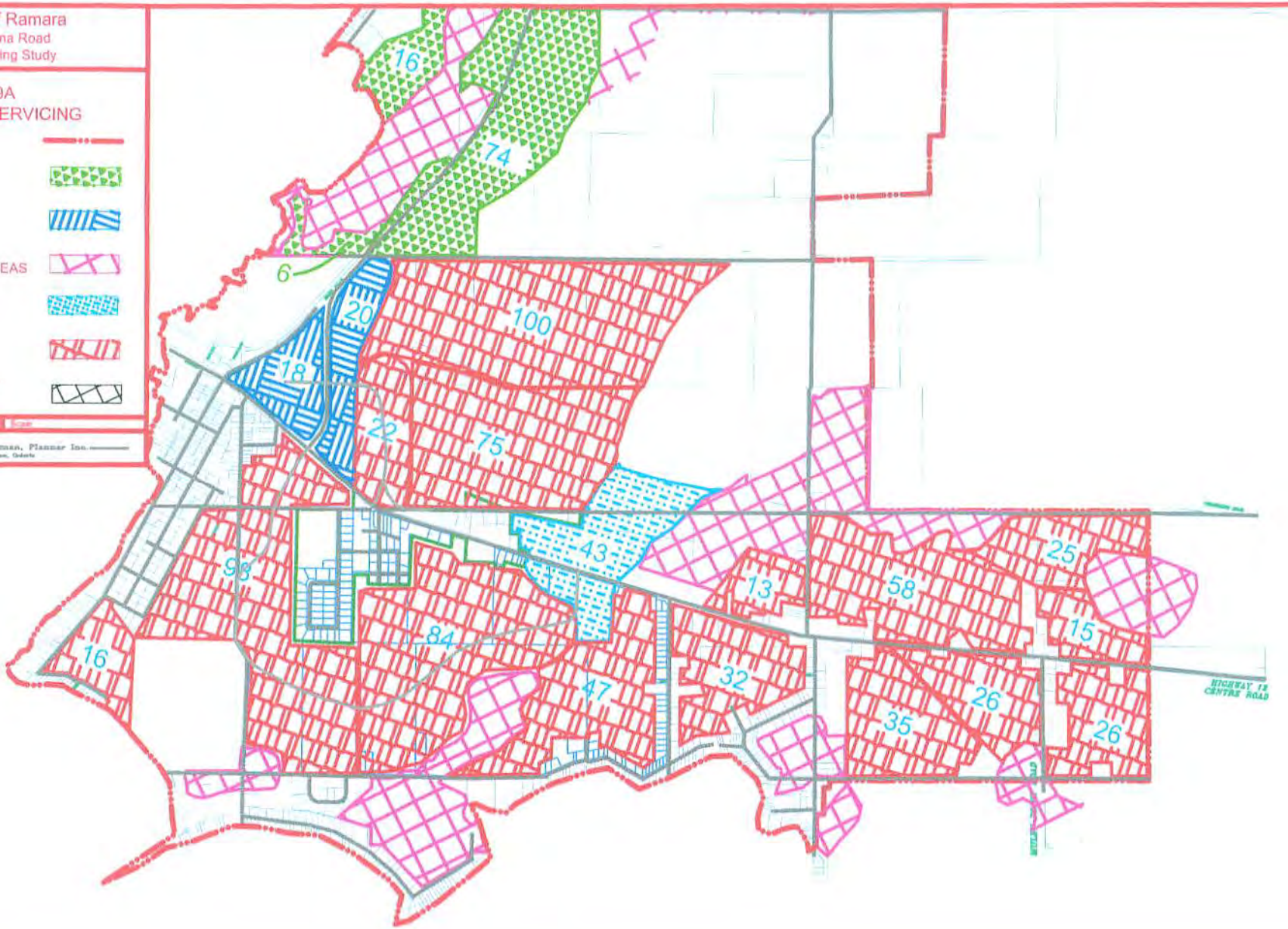
COMMERCIAL / INSTITUTIONAL

RESIDENTIAL

MNJIKANING FIRST NATIONS

Date: July 2008 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

MAP 9A
INDIVIDUAL SERVICING

Study Area Limits

DESTINATION COMMERCIAL

COMMERCIAL

RESTRICTED DEVELOPMENT AREAS

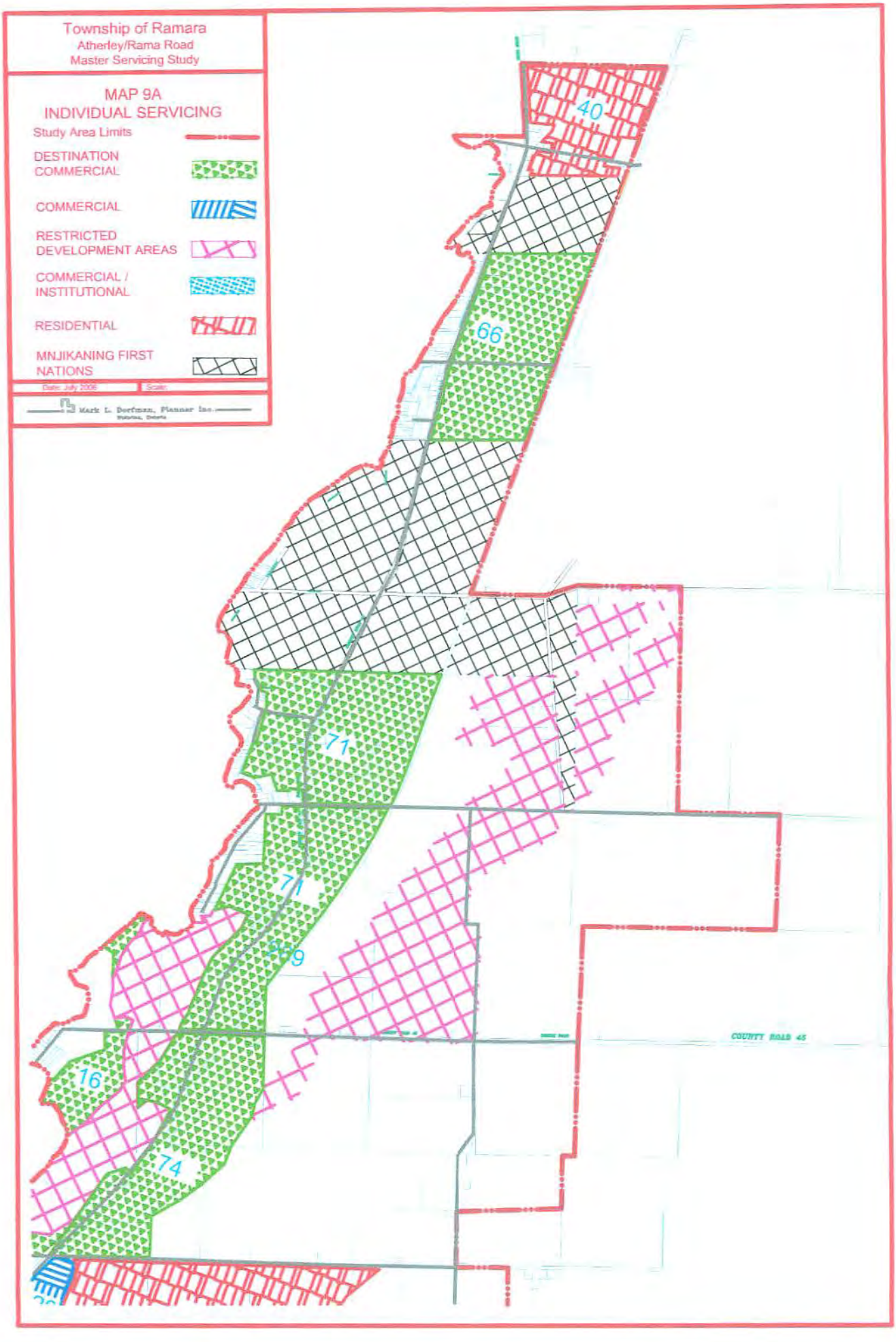
COMMERCIAL / INSTITUTIONAL

RESIDENTIAL

MNJIKANING FIRST NATIONS

Date: July 2006 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario



Township of Ramara
Atherley/Rama Road
Master Servicing Study

MAP 9B
COMMUNAL SERVICING

Study Area Limits

DESTINATION COMMERCIAL

COMMERCIAL

RESTRICTED DEVELOPMENT AREAS

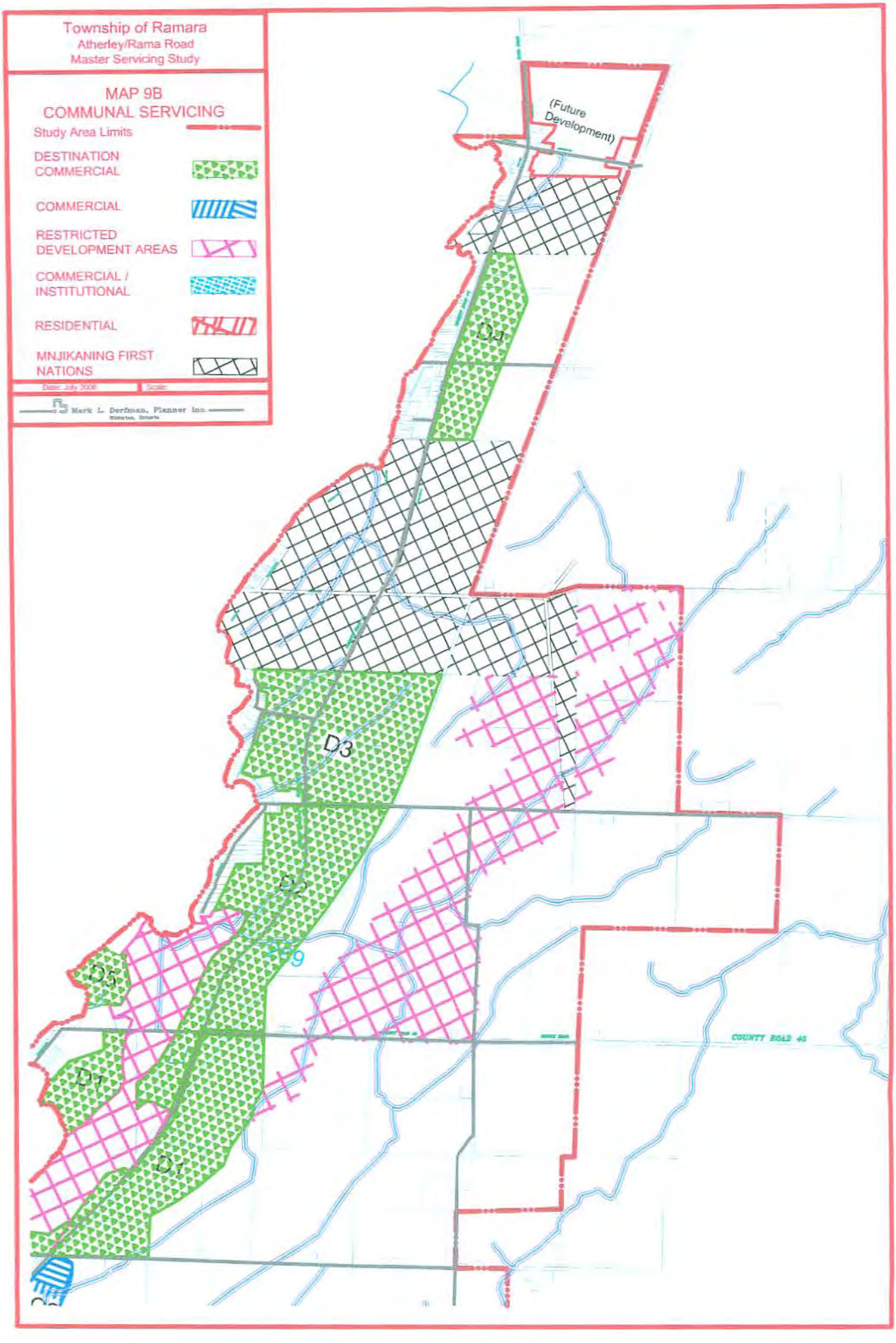
COMMERCIAL / INSTITUTIONAL

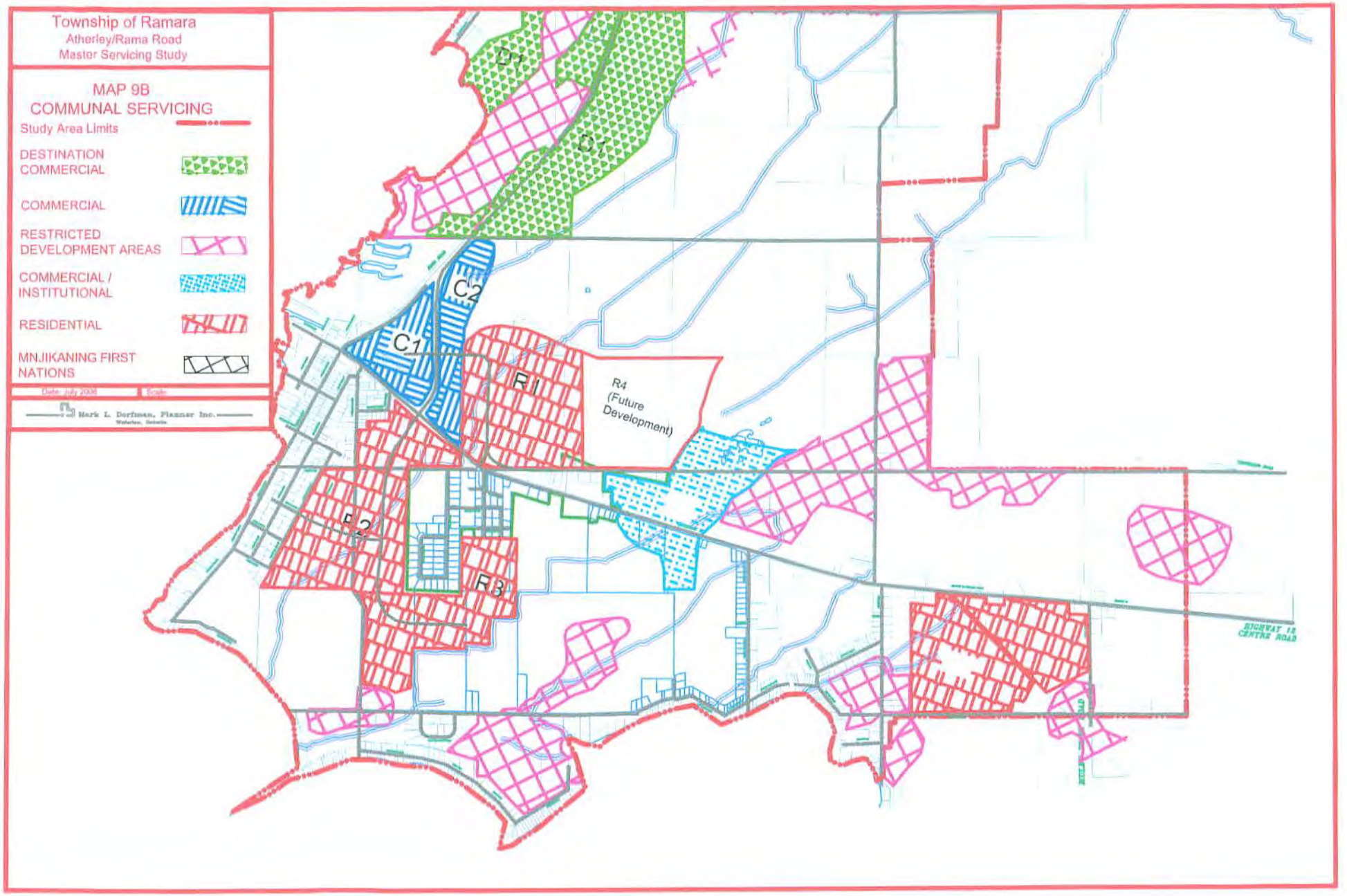
RESIDENTIAL

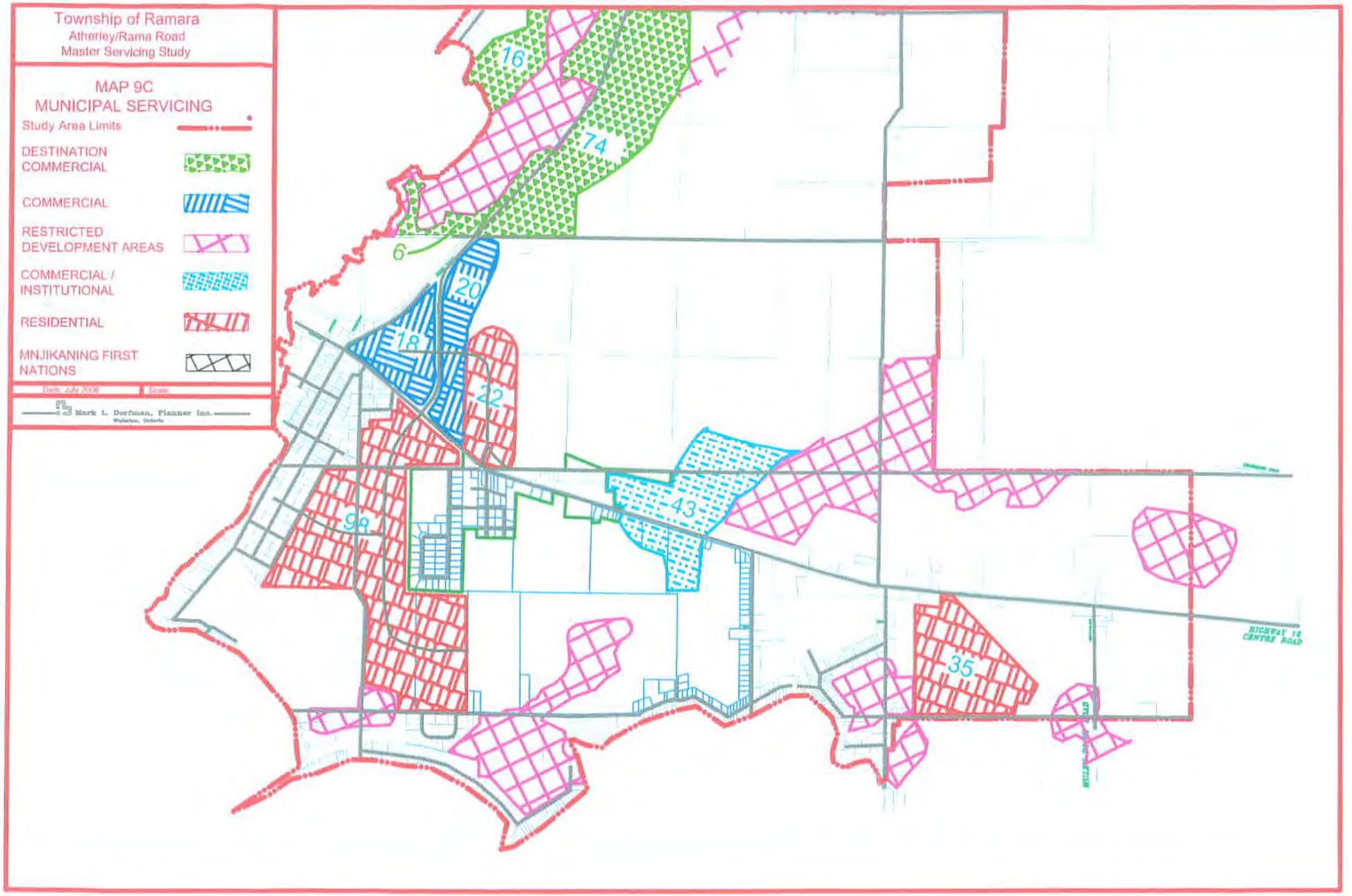
MNJIKANING FIRST NATIONS

Date: July 2006 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario




Township of Ramara
Atherley/Rama Road
Master Servicing Study
MAP 9B
COMMUNAL SERVICING
Study Area Limits
DESTINATION COMMERCIAL
COMMERCIAL
RESTRICTED DEVELOPMENT AREAS
COMMERCIAL / INSTITUTIONAL
RESIDENTIAL
MNJIKANING FIRST NATIONS
Date: July 2006
Scale:
Mark L. Dorfman, Planner Inc.
Waterloo, Ontario
C3
C2
C1
C2
R1
R4
(Future
Development)
R2
R3
HIGHWAY 12
CENTRE ROAD


Township of Ramara
Atherley/Rama Road
Master Servicing Study
MAP 9C
MUNICIPAL SERVICING
Study Area Limits
DESTINATION COMMERCIAL
COMMERCIAL
RESTRICTED DEVELOPMENT AREAS
COMMERCIAL / INSTITUTIONAL
RESIDENTIAL
MNJIKANING FIRST NATIONS
Date: July 2006
Scale
Mark L. Dorfman, Planner Inc.
Waterloo, Ontario
16
74
6
20
18
12
43
9a
35
HIGHWAY 12
CENTRE ROAD

Township of Ramara
Atherley/Rama Road
Master Servicing Study

MAP 9C
MUNICIPAL SERVICING

Study Area Limits

DESTINATION COMMERCIAL

COMMERCIAL

RESTRICTED DEVELOPMENT AREAS

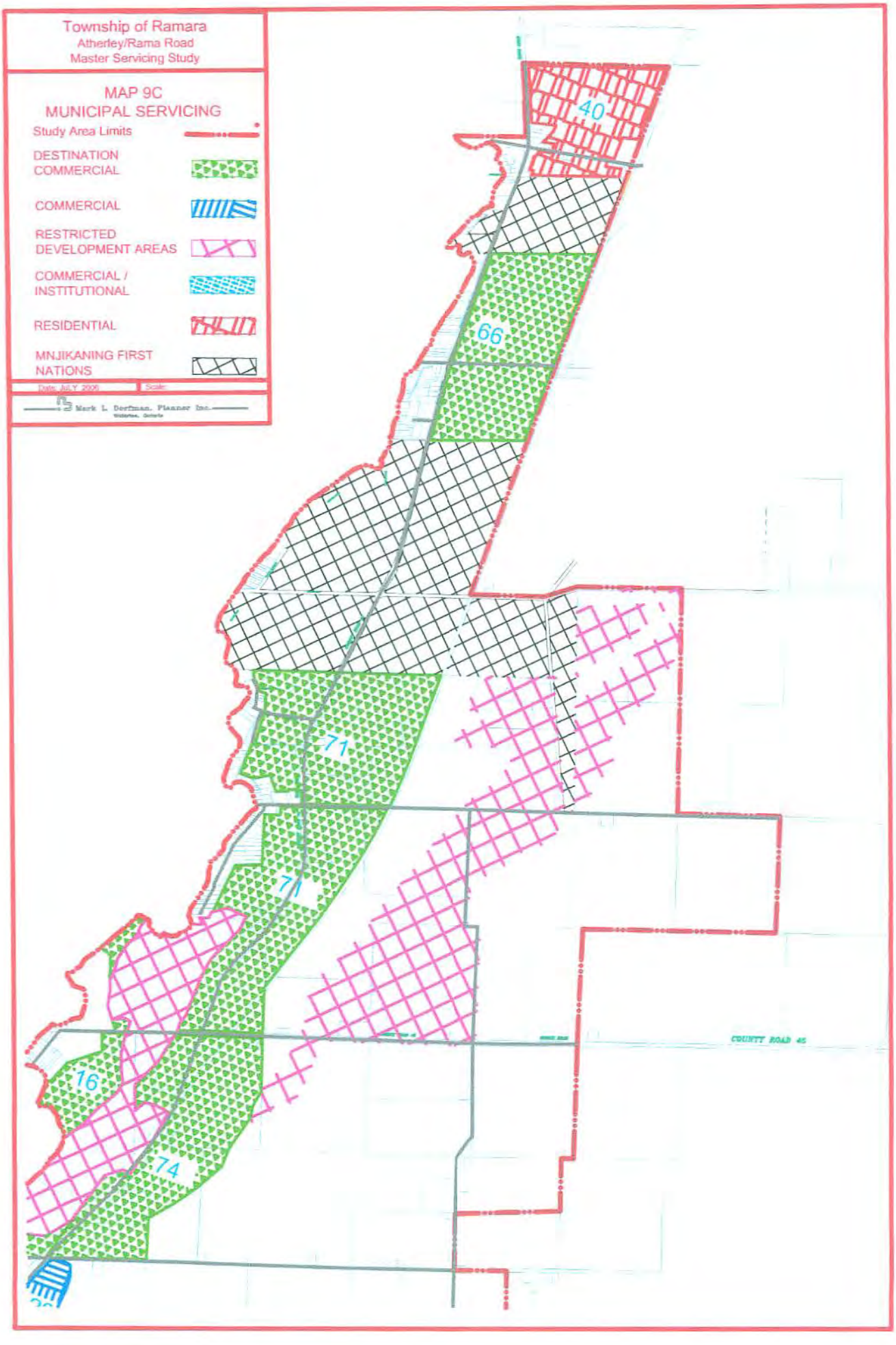
COMMERCIAL / INSTITUTIONAL

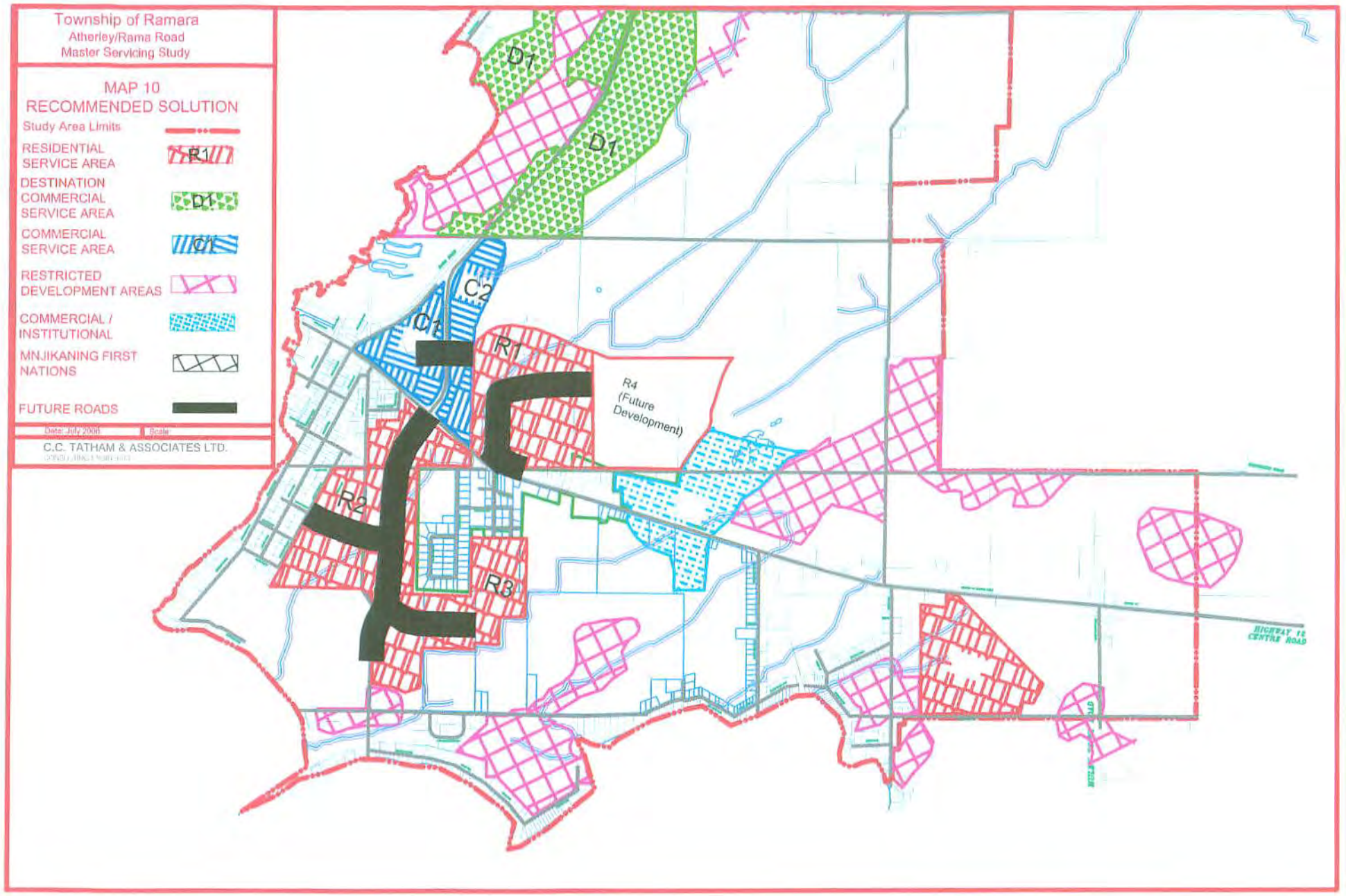
RESIDENTIAL

MNJIKANING FIRST NATIONS

Date: JULY 2006 | Scale:

Mark L. Dorfman, Planner Inc.
Waterloo, Ontario




Township of Ramara
Atherley/Rama Road
Master Servicing Study
MAP 10
RECOMMENDED SOLUTION
Study Area Limits
RESIDENTIAL SERVICE AREA
R1
DESTINATION COMMERCIAL SERVICE AREA
D1
COMMERCIAL SERVICE AREA
C1
RESTRICTED DEVELOPMENT AREAS
COMMERCIAL / INSTITUTIONAL
MNJIKANING FIRST NATIONS
FUTURE ROADS
Date: July 2006
Scale
C.C. TATHAM & ASSOCIATES LTD.
D1
D1
C2
C1
R1
R4
(Future
Development)
R2
R3
HIGHWAY 12
CENTRAL ROAD

Township of Ramara
Atherley/Rama Road
Master Servicing Study

MAP 10
RECOMMENDED SOLUTION

Study Area Limits

RESIDENTIAL SERVICE AREA — R1

DESTINATION COMMERCIAL SERVICE AREA — D1

COMMERCIAL SERVICE AREA — C1

RESTRICTED DEVELOPMENT AREAS

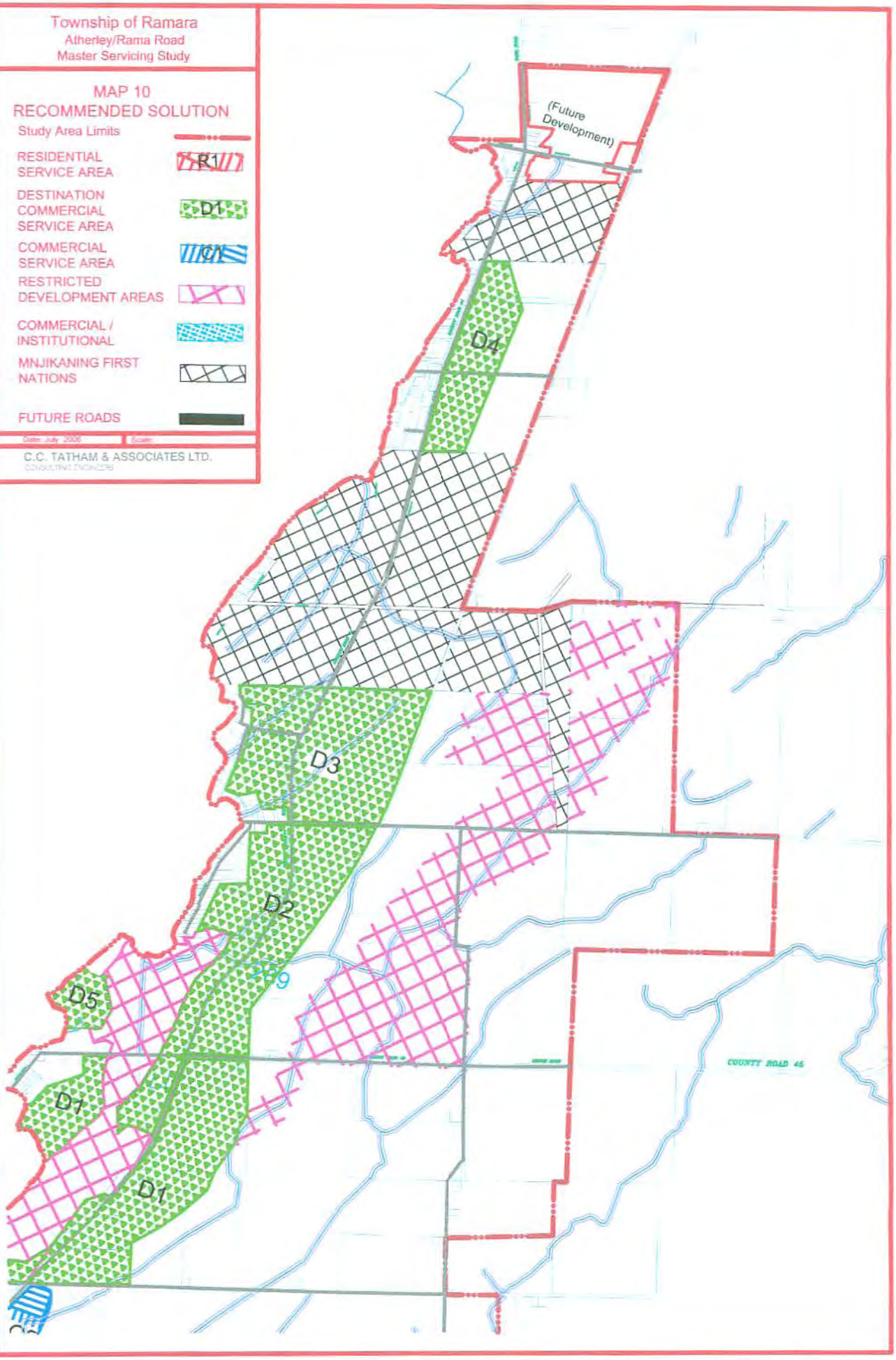
COMMERCIAL / INSTITUTIONAL

MNJIKANING FIRST NATIONS

FUTURE ROADS

Date: July 2006 | Scale:

C.C. TATHAM & ASSOCIATES LTD.
CONSULTING ENGINEERS



APPENDIX A:
NOTICE OF COMMENCEMENT AND LIST OF RESPONDENTS

THE TOWNSHIP OF RAMARA
ATHERLEY SECONDARY PLAN AREA/
RAMA ROAD CORRIDOR
MASTER SERVICING PLAN

NOTICE OF STUDY COMMENCEMENT

The official plan for the Township of Ramara allows for possible development within the Atherley Secondary Plan Area and Rama Road Corridor. As a result the Township is undertaking a study to establish a Master Servicing Plan. The study will consider options for: potable water supply and distribution; sewage collection, treatment and effluent disposal; drainage, and stormwater management; and transportation.

The study is being conducted to follow the guidelines and requirements for the Phases 1 and 2 of the *Municipal Class Environmental Assessment* process (Municipal Engineers Association, June 2001). This is an approved process under the Environmental Assessment Act.

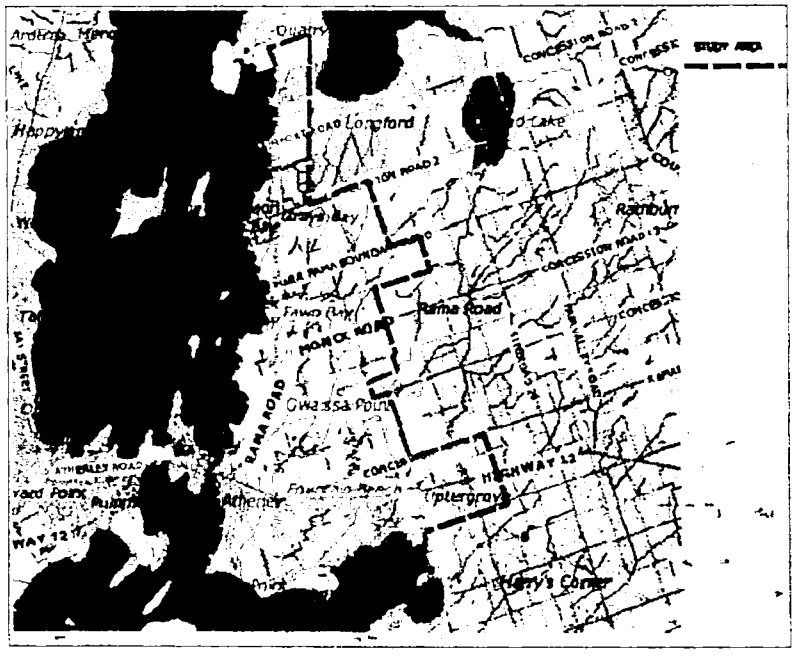
The purpose of this notice is to invite public input and comment early in the study such that it can be incorporated into the planning and overall study design. A further opportunity for public input and comment will be provided at a Public Information Centre (PIC) to be held within a few months, during which time the identification and evaluation of various options will be presented. Further details with respect to the PIC will be provided closer to the date.

The study is being completed by C.C.Tatham & Associates Ltd. (lead consultant) in conjunction with Mark L. Dorfman, Planner Inc. (municipal planning), Michalski Nielsen Associates Limited (natural environment), and Golder Associates (hydrogeology). For additional information pertaining to the study or the EA process, or to be added to the project contact list, please contact the project manager:

C.C. Tatham & Associates Ltd.
50 Andrew Street South, Unit 202
Orillia, ON L3V 7T5

Mr. Tim Collingwood, P. Eng.
Project Manager
atherley-msp@cctatham.com

t: (705) 325-1753
f: (705) 325-7420
info@cctatham.com



This notice issued June 17, 2004.

With the exception of personal information, all comments received will become part of the public record.

Company	Contact	City	Province	Postal Code
Mnjikaning First Nation		Rama	Ontario	L0K 1T0
Fern Resort	Mark Downing	Orillia	Ontario	L3V 6H5
Fern Resort	Robert Downing	Orillia	Ontario	L3V 6H5
City of Orillia	Kathy Suggitt, Director of Planning	Orillia	Ontario	L3V 7T5
County of Simcoe	Ian Bender	Midhurst	Ontario	L0L 1X0
Rudy & Associates	Angela Rudy	Orillia	Ontario	L3V 6K8
Rudy & Associates	Jill Lewis	Orillia	Ontario	L3V 6K8
Hydro One		Barrie	Ontario	L4M 5N5
Union Gas		North Bay	Ontario	P1B 8R7
Rogers Cable		Barrie	Ontario	L4M 6B8
Bell Canada		Barrie	Ontario	L4M 3B1
Simcoe District School Board	Holly Spacek, MCIP, RPP Planning Officer	Midhurst	Ontario	L0L 1X0
Simcoe Muskoka Catholic District School Board	Tracy Haynes, B.E.S. Planning Department	Barrie	Ontario	L4M 5K3
Lake Simcoe Region Conservation Authority	Mike Walters, Director Watershed Management	Newmarket	Ontario	L3Y 4X1
Lake Simcoe Region Conservation Authority	Gayle Wood, CAO/Secretary - Tresurer	Newmarket	Ontario	L3Y 4X1
Severn Sound Environmental Association	Keith Sherman, Coordinator	Midland	Ontario	L4R 4K6
Ministry of the Environment	Barrie - Phil Bye, District Manager	Barrie	Ontario	L4N 5R7
Ministry of the Environment	Technical Support Section - Bill Armstrong	London	Ontario	N6E 1L3
Ministry of the Environment	Dr. Ron Griffiths, EA Coordinator	London	Ontario	N6E 1L3
Ministry of Transportation	Roger Hanmer, Regional Director	Downsview	Ontario	M3M 1J8
Ministry of Transportation	Tom Hewitt	Downsview	Ontario	M3M 1J8
Ministry of Natural Resources - Midhurst	Kathy Woeller District Planner	Midhurst	Ontario	L0L 1X0
Simcoe Muskoka District Health Unit	Dr. Charles Gardner	Barrie	Ontario	L4M 6K9
Canadian Coast Guard/DFO	Brenda Bickham	Prescott	Ontario	K0E 1T0
Ministry of Culture, Tourism and Recreation	Midhurst Office	Midhurst	Ontario	L0L 1X0
Ministry of Health	Matthew Smith - Team Leader	Barrie	Ontario	L4M 6T4
Ministry of Industry, Trade and Technology		Toronto	Ontario	M5C 2W7
Ministry of Municipal Affairs	Tim Haldenby	Toronto	Ontario	M5G 2E5
Environment Canada	Pradeep Khare - Regional Director General	Downsview	Ontario	M3H 5T4
Transport Canada	Jennifer Hughes	North York	Ontario	M2N 6A5
Department of Fisheries and Oceans		Burlington	Ontario	L7R 4A6
	Konrad Brenner	Orillia	Ontario	L3V 6H6
	Robert Platts	Georgetown	Ontario	L7G 4C1
Transport Canada Marine Safety	Barry Putt	Sarnia	Ontario	N5T 2M4
C. Hewson Bourne, Q.C.	Hew Bourne	Orillia	Ontario	L3V 6H6
	Timothy Bourne	Ottawa	Ontario	K1S 0L9

	Ross Manser			
	Bruce and Virginia Miller	Orillia	Ontario	L3V 6H7
	Dave Hawlkins	Orillia	Ontario	L3V 6H5
Trent-Severn Waterway/Parks Canada	Beth Cockburn EA Officer	Peterborough	Ontario	K9J 6Z6
	Gary Guglick			
	Philip Macdonald			
	Bob Mingie			
M.A.T. Engineering	Mike Tataryn	Barrie	Ontario	L4N 0T5
	Frank Vinodolac	Vaughan	Ontario	L4K 5X3
	Barry J. Sklar	Toronto	Ontario	M4P 2E7
Group Aquitaine Limited	Mr. Bernie Bulaong	Thornhill	Ontario	L3T 7T1
Richard Wengle Architect Inc.	Peggy P.K. Chiu	Toronto	Ontario	M5N 1E3
Remax Orillia Realty Ltd.	Jamie Whibley	Orillia	Ontario	L3V 6R9
Remax Orillia Realty Ltd.	Ian Ross	Orillia	Ontario	L3V 6R9
The Jones Consulting Group Ltd.	Tim Cane	Barrie	Ontario	L4N 0B1
Fausto Saponoara				
Pencross Holdings Ltd	Ian Filshill	Toronto	Ontario	M4G 3C2
	Tyrwhitt (Terry) Carman			
	Cyril Chase (Hand Delivered by RJM)			
	Wes Franklin	Richmond Hill	Ontario	L4E 3V4
The Kirkwood Group	Glenn Greene	Orillia	Ontario	L3V 6H6
	Neil Morris			

APPENDIX B:
NOTICE OF PUBLIC INFORMATION CENTRE AND COMMENTS RECEIVED

TOWNSHIP OF RAMARA
NOTICE OF PUBLIC INFORMATION CENTRE
ATHERLEY SECONDARY PLAN AREA/RAMA ROAD CORRIDOR
MASTER SERVICING PLAN

The Township of Ramara invites you to attend a Public Information Centre to consider the recommended solution for the proposed Atherley Secondary Plan Area/Rama Road Corridor Master Servicing Plan. The Public Information Centre will be held:

Wednesday, April 12, 2006
3 p.m. to 5 p.m. and 6:30 p.m. to 8:00 p.m.
At the
Ramara Centre
5482 Highway 12, Atherley

The purpose of the Public Information Centre is to update interested parties of the evaluation of various options considered under the Master Servicing Plan and provide them an opportunity to provide comments and feedback regarding the recommended solution. This meeting is being hosted by the municipality as part of the Municipal Class Environmental Assessment process initiated by the municipality in June, 2005.

If you have any comments with respect to this study and are unable to attend the meeting, information regarding the Master Servicing Plan can be obtained from the project manager:

Mr. Tim Collingwood, P. Eng
C. C. Tatham & Associates Ltd.
50 Andrew Street South, Unit 202
Orillia, ON L3V 7T5
Tel: 705-325-1753
Fax: 705-325-7420
Email: atherley-msp@cctatham.com

Written or verbal comments will be received up to April 28, 2006.

Dated at the Township of Ramara on the 28 day of March, 2006.

Mr. Richard Bates
P.O. Box 130
2297 Highway #12
Brechin, ON L0K 1B0

With the exception of personal information all comments received will become part of the public record.

TOWNSHIP OF RAMARA
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre – April 12, 2006

SIGN-IN SHEET (please print)					
NAME	STREET ADDRESS	TOWN/CITY	POSTAL CODE	AFFILIATION	EMAIL
Joe Public	123 Your Street	Your Town	A1B 2C3	resident	joe@home.com
Kiet Ngo	[redacted]	Scarborough	M1V 2K9	First Pro	[redacted]
[illegible]	[redacted]	Woodbridge Ont	L4L 8S6.		
[illegible]	[redacted]	Orillia	L3V 6J7	yes	[redacted]
[illegible]	[redacted]	Orillia	L3V 1B1	[illegible]	
P.A. MacDonald	[redacted]	"	L3V 6H6	res.	
Bill Duffy	[redacted]	Ramara	L3V 6H7		
John O'Donnell	[redacted]		L0K 1B0	yes	
Kathy O'Donnell	[redacted]	"	"	"	
Nathan Westendorp	[redacted]	(Springwater) County of Simcoe	L0L 1X0	County of Simcoe	[redacted]
Paul Gounsten	[redacted]	Ramara	L0K 1L0	resident	[redacted]
[illegible]	[redacted]	Ramara	L3V 6H7	resident	
Hew Douglas	[redacted]	Orillia	L3V 6H6.	resident.	[redacted]

[redacted]

TOWNSHIP OF RAMARA

Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre – April 12, 2006

SIGN-IN SHEET (please print)					
NAME	STREET ADDRESS	TOWN/CITY	POSTAL CODE	AFFILIATION	EMAIL
Joe Public	123 Your Street	Your Town	A1B 2C3	resident	joe@home.com
Dene Inge Walton	[redacted]	Orillia	L3V 6H6	✓	
Fred Galliven	[redacted]	Orillia	L3V 6H5	✓	
Gemma Healy	[redacted]	Orillia	L3V 7B4	✓	[redacted]
Lenore MacDonald	[redacted]	Orillia	L3V 6H6	✓	
Bernie Bulaong	Days Inn, Rama Rd	—	—		
Barry Brown	[redacted]	Orillia	L3V 2C7	✓	
Cindy + Mark Johnson	[redacted]	Ramara		✓	
Dave Joyce	[redacted]	Barrie	L4N 5S4	—	
Jamie Whisley	[redacted]	Washago	L0K 2B0	✓	[redacted]
Jill Lewis	Rudy + Associates Ltd, P.O. Box 534 [illegible]	Orillia	L3V 6K8		[redacted]
Tanya Pallopson	" "	"	"	✓	[redacted]
Frank Vinodolac	[redacted]	Toronto	M6G 2N8		

TOWNSHIP OF RAMARA
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre – April 12, 2006

SIGN-IN SHEET (please print)

NAME	STREET ADDRESS	TOWN/CITY	POSTAL CODE	AFFILIATION	EMAIL
Joe Public	123 Your Street	Your Town	A1B 2C3	resident	joe@home.com
Christina Page	[redacted]	Brechin	L0K 1B0	"	"

TOWNSHIP OF RAMARA
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre – April 12, 2006

SIGN-IN SHEET (please print)

NAME	STREET ADDRESS	TOWN/CITY	POSTAL CODE	AFFILIATION	EMAIL
Joe Public	123 Your Street	Your Town	A1B 2C3	resident	joe@home.com
Margaret Mulvihill	[redacted]	Orillia	L3V 6H7	resident.	
Murray Mulvihill	[redacted]	Orillia	L3V 6H7	resident.	
Lynda Davidson	[redacted]	Orillia	L3V 1A6	resident	
Dave Hawke	[redacted]	Ramara.	L3V 6H5	resident	
[illegible]	[redacted]	Rama		resident	
[illegible]	[redacted]	[illegible]	L0Z 1B1	Developer.	
[illegible]	[redacted]	Orillia	L3V 6H7	resident	
[illegible]	"	"	"	"	
Don Small	[redacted]	"	"	"	
Bruce Miller	[redacted]	"	"	"	
CHRIS BERNI	[redacted]	ORILLIA	L3V 6H7	✓	
RICHARD/BARBARA WHITTY	[redacted]	ORILLIA	L3V 6H7	✓	

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TOWNSHIP OF RAMARA
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre – April 12, 2006

SIGN-IN SHEET (please print)

NAME	STREET ADDRESS	TOWN/CITY	POSTAL CODE	AFFILIATION	EMAIL
Joe Public	123 Your Street	Your Town	A1B 2C3	resident	joe@home.com
Martin Kidner	[redacted]	TORONTO	M5E 1J8		[redacted]
Eric Orr	[redacted]	Uptergrove	L3V 6H7	XX	
Ross MacDonald	[redacted]	Orillia	L3V 6H6	XX	
[illegible]	[redacted]	Georgetown Orillia	L7G 4C1	✓ ✓	
R Bates	[redacted]	Orillia	–	Twsp Ramara	
K Johnstone	[redacted]	Innisfil	L9S 2E7	Twsp Ramara	
H Spacek	Simcoe County District School Board		L0L 1X0	Planner	[redacted]
K Pittam	[redacted]	ORILLIA	L3V 6H7	YES	
G Greene	[redacted]	Orillia	L3V 6H6	resident	[redacted]
Annalynn Faulkner		Longford	L0K 1L0	〃	[redacted]
KEVIN BOBECHKO	[redacted]	MARKHAM	L3R 0G1	CONSULT ENGINEER	[redacted]
MARK DOUGLAS	[redacted]		L0K 1C0	MNJIKANING F	[redacted]

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TOWNSHIP OF RAMARA
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre – April 12, 2006

SIGN-IN SHEET (please print)

NAME	STREET ADDRESS	TOWN/CITY	POSTAL CODE	AFFILIATION	EMAIL
Joe Public	123 Your Street	Your Town	A1B 2C3	resident	joe@home.com
DAVE STEPHEN	[redacted]	BRECHIN	L0K 1B0	✓	
Murray Scott & Julie	[redacted]	Atherly	L3V 0W3	✓	
MILTON BAKER	[redacted]	ORILLIA	L3V 6H7	✓	
NORM WHITNEY	[redacted]	ATHERLY	L3V 6H7	✓	
Doug & Jan Kendall	[redacted]	ORILLIA	L3V 6H7	✓	
[illegible]	[redacted]	ATHERLEY	L3V 1Z8	✓	
[illegible]	[redacted]	ORILLIA	L3V 1B4	✓	
PETER DANCE	CITY OF ORILLIA				[redacted]
Wm Hutchinson	[redacted]	ORILLIA	L3V 6H6	✓	
[illegible]	[redacted]	ORILLIA	L3V 6H7	✓	[redacted]
K RICHARDS	[redacted]	ELMVALE	L0P 1P0	✓	
MIKE TATARYN	[redacted]	BARRIE	L4N 0T5		[redacted]

S:\Worddocs\301869\PIC 1 sign-in.doc

SIMCOE ENGINEERING

Tel: 905-895-1281
1-800-465-0437
Fax: 905-853-5881
E-Mail: info@lsrca.on.ca
Web: www.lsrca.on.ca

120 Bayview Parkway
Box 282
Newmarket, Ontario
L3Y 4X1

Sent by Facsimile 1-705-325-1753

May 18, 2006

File No.: Secondary Plan - 2005
IMS No.: PPSC16C4

Mr. Tim Collingwood, P.Eng.
50 Andrew Street South
Unit 202
Orillia, ON L3V 7T5

Dear Mr. Collingwood:

Re: Atherley / Rama Road Corridor MSP
Letter Dated April 24, 2006
Township of Ramara

We have completed our review of the above noted letter and P.I.C. information package that we received on April 27, 2006 and comment as follows. We will provide further comments at the detailed design stage:

1) Portions of the study area (in the Lake Simcoe drainage basin) are regulated by the Authority due to the presence of wetlands, watercourses, floodplain and valley systems. Proposed development within these areas would require a permit from the Authority and would need to comply with Authority Development Policies.

55 Watershed Conservation

2) It is recommended that Terms of Reference be drafted for future technical studies (Floodplain, Master Drainage, Hydro-geological, Natural Heritage etc.) in the subject area and circulated to the Authority for our review. Please note that the limits of development will be established as a result of these future studies. The Master Servicing Plan as described does not provide the level of detail required to support future development in specific areas.

Should you have any questions regarding the above, please do not hesitate to contact the undersigned at 905-895-1281, extension 240. Please refer to the above noted file number in all future correspondence.

A Watershed for Life

Yours truly,

Tom Hogenbirk, P.Eng., CMM
Manager, Engineering and Technical Services

TH/ph

\\lsdata\shared\TomH\RAM MSP.wpd

RUDY & ASSOCIATES LTD.
Planning for People, Places, and the Future

May 12, 2006

3 Pages sent by fax only

C.C. Tatham & Associates Ltd.
50 Andrew St. South, Unit 202
Orillia, ON
L3V 7T5

Attn: Tim Collingwood, P.Eng.

Re: Township of Ramara
North Half Lot 27, Concession 13
Vacca Development
Project No. 224

Mr. Victor Vacca is interested in developing the above mentioned property. This property is located along County Road 44 south of the Casino, in the Rama Corridor Special Policy Area. The property is approximately 10.5 ha (26 acres) in size.

Official Plan Designation & Zoning:

The property is currently designated "Rural" and zoned as "Rural (R) Zone" in the Township of Ramara planning documents. A copy of Map G2 from Zoning By-law 2005.85 is attached identifying the subject property.

To accommodate the proposed development on the subject property an amendment to the Official Plan and Zoning By-law is required. The proposed designation and zoning is "Destination Commercial" with site specific zone provisions to accommodate the various land uses on the site.

Proposed Development & Servicing Scenario:

The owner would like to develop the property with a number of residential condominium buildings, and commercial land uses off of County Rd. 44.

Cansult Engineering have reviewed the site to provide a preliminary sewage capacity scenario. It has been confirmed that using an onsite communal sewage treatment system, the site can accommodate a number of condominium buildings and a variety of commercial uses. These uses and footprints will be refined as we move through the planning process.

This particular property and the type of development proposed for the site is conducive to being serviced with a larger communal sewage treatment system. There are opportunities to cost share with adjacent landowners with similar developments proposed along County Rd. 44.

Master Servicing Plan

The recommended servicing solution was identified at the Public Information Centre on April 12th, 2006. The recommendations of the plan indicated the subject property has been included into the D2 – Resort Commercial Area designated for development with a large communal system.

The landowner is interested in proceeding with the development of the subject property and would like to move forward with a development scenario for consideration. As such, our firm will be continuing with the background research to determine the appropriate land uses and layout for this property.

We trust this submission is appropriate and request that we be kept informed of future meetings and/or materials available as the Master Servicing Plan is finalized.

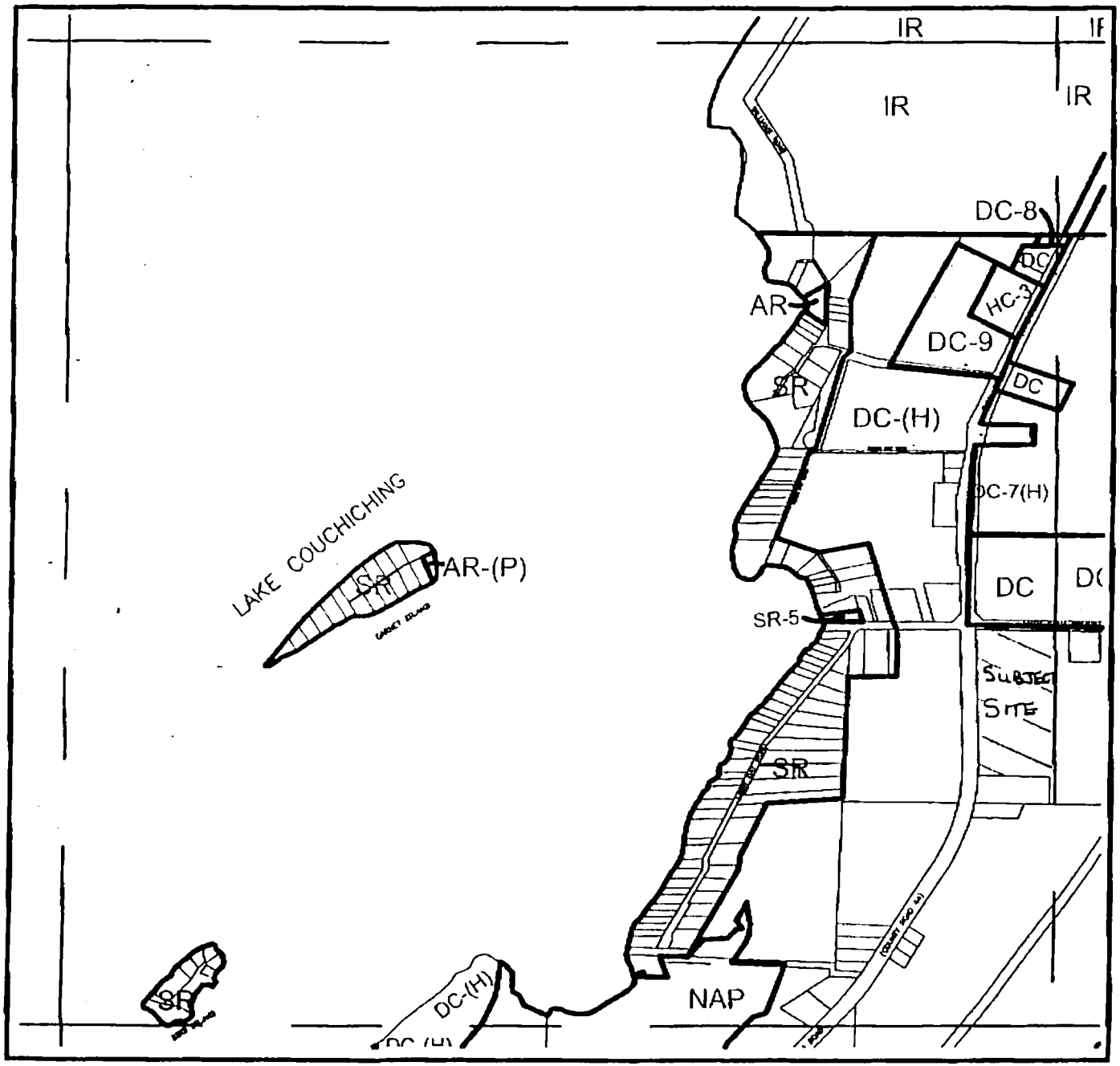
We remain available for any questions you may have regarding this site.

Yours truly,

RUDY & Associates Ltd.

Angela M. Rudy, MCIP, RPP
Planner * Mediator

cc: Mark Dorfman, Planning Consultant - By Fax Only
Deb McCabe, Planning Administrator - By Fax Only
Mr. Victor Vacca - By Fax Only



TOWNSHIP OF RAMARA
SCHEDULE "A"
TO BY-LAW 2005.85

Map G2

ZONES

NAP	Natural Area Protection
AG	Agriculture
RU	Rural
RCR	Rural and Countryside Residential
VR	Village Residential
VC	Village Commercial
VID	Village Industrial
VIN	Village Institutional
H	Hamlet
SR	Shoreline Residential
IND	Industrial
DC	Destination Commercial
HC	Highway Commercial
MAE	Mineral Aggregate Extraction
W	Waste Processing and Disposal
AR	Active Recreation
PR	Passive Recreation

IR Indian Reservation

Municipal Boundary

Wellhead Protection Area

Revision Date:

Scale: 1:12000

Mark L. Dorfman, Planner Inc.

From: "konrad brenner" [redacted]
To: Atherley MSP
Date: Saturday - April 22, 2006
Subject: Master Serive Plan Ramara

Mr. T. Collingwood

Please find attached a copy of my comments I sent (signed) to the Township on the Master Plan as discussed on April 20th.

Konrad Brenner

KONRAD BRENNER

[redacted]

[redacted]

ORILLIA, ON

L3V 6H6

[redacted]

[redacted]

2006 April 22

Mr. Richard Bates

Chief Administrative Officer

The Township of Ramara

P.O. Box 130

Brechin, On

L0K 1B0

Re.: Master Servicing Plan

Dear Mr. Bates

The following are my comments in response the master servicing plan for the Atherley / Uptergrove and Rama Road corridor prepared by C.C. Tatham & Associates Ltd. and presented at the public meeting on April 12th.

The scheme presented in the master servicing plan is reasonable for servicing new development but does not cover the provision of sewer and water services to the existing residents or businesses. The provision of services for the latter should be part of the planning process. The planning work undertaken to facilitate the growth, as proposed in the Township's Official Plan, has to date ignored the new development's impact on the health and welfare of the existing residents.

A municipality which is contemplating approving new development is expected to "have regard to the health and welfare" of the existing residents under the Planning Act. There is no evidence that this has been done, i.e. no groundwater quality study, no service plan. The existing residential development largely relies on private wells and septic tank systems for water and sewage service. The existing systems are likely marginal as measured by to day's standards because of soil conditions, water quality, and lot sizes. In the light of this, it is unreasonable to assume that the new development envisioned in the Township's Official Plan can be implemented without significant negative impact on the existing population's health and welfare, (including financial impact).

For the above reasons I recommend that, in order to comply with the intent of the Environment Assessment Act and the Planning Act, Council

- expand the scope of the Master Servicing Study to include existing development, and

- undertake a study on the ground water the quality in the Atherley, Uptergrove, Rama Road corridor area.

Konrad Brenner

KONRAD BRENNER
[redacted]
ORILLIA, ON
L3V 6H6
[redacted]
2006 April 22

Mr. Richard Bates
Chief Administrative Officer
The Township of Ramara
P.O. Box 130
Brechin, On
L0K 1B0

Re.: Master Servicing Plan

Dear Mr. Bates

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- undertake a study on the ground water the quality in the Atherley, Uptergrove, Rama Road corridor area.

Konrad Brenner

Donald R. MacDonald

[redacted]
Orillia, Ontario
L3V 6H6

[redacted]

April 24, 2006

An open letter to the Township of Ramara Council

Re: The Atherley/Uptergrove Secondary Plan Area/Rama Road Corridor, Master Servicing Plan, Public Information Centre held on April 12, 2006 at the Ramara Centre

Dear Council:

It appears to me that there are many inconsistencies in the plan which I understand cost approximately one hundred thousand dollars to prepare

As I am told, watershed planning is a main consideration. Why is it that lots 25 and 26, Concession Eleven are included in the Plan area when they are not even in the Lake Couchiching /Simcoe watershed but are located in the very provincially significant Mud Lake wetland watershed area? Also, why is the north half of Lot 23, Concession 13 included in the study while the adjacent Lot 23, Concession 1 is not? They both show an area of approximately one half being in the Couchiching and Mud Lake watersheds. Can you explain?

Why are the lands adjacent to Casino Rama owned by David and Arleen Willison and the golf course lands west of Side Road 25/26 north of the Monck Road in the Restricted Development Area?

Why are the lands on the north half of Lot 24, Concession 1 in the Restricted Development Area when the wetland has been drained and is being filled?

Why are such outdated area/photograph maps used?

Why was the wetland area west of the Uptergrove school not recognized?

Why did Ramara Council members, specifically Neal Snuch, Basil Clark, Marilyn Brooks, and Deputy Mayor Dan McMillen NOT attend the Public Information Centre? Was a hundred thousand dollar study concerning the future development in Ramara Township not important enough to attend in person?

Donald R. MacDonald

MNJIKANING
FIRST NATION

Office of the Chief and Council

May 8, 2006

C.C. Tatham & Associates Ltd.
50 Andrew Street South, Unit 202
Orillia, ON
L3V 7T5

Attention: T. Collingwood, P. Eng.

Re: Atherley / Rama Road Corridor Master Servicing Plan
Public Information Centre
Township of Ramara

Dear T. Collingwood:

Thank you for your letter of April 24, 2006 which was received on April 28th with respect to the Atherley / Rama Road Corridor Master Servicing Plan.

Please be advised that a copy of your letter has been forwarded to our respective departments including our First Nation Manager, Daniel Shilling, for further review and if necessary, direct response to you.

We appreciate your taking the time to share this information with us.

Sincerely,

Sharon Stinson Henry /sj
Chief Sharon Stinson Henry

c: Council
Daniel Shilling, First Nation Manager

SSH/jj

From: "Doyle, Heather (MTO)" <Heather.A.Doyle@mto.gov.on.ca>
To: "'tcollingwood@cctatham.com'" <tcollingwood@cctatham.com>
Date: 02/05/2006 12:13:52 pm
Subject: Atherley Secondary Plan (Ramara Twp.) - your file 301869

Hello:

In response to your circulation of the Atherley Secondary Plan to our Central Region, Director, Roger Hanmer, the location and design of proposed new collector road intersections at and in proximity to Highway 12 will be subject to MTO review and approval. We request that the future Master Servicing Plan document include a transportation study detailing anticipated Secondary Plan impacts on, and recommendations for, development driven Highway 12 improvements.

We would respectfully request that any future correspondence on Secondary plans and official plans be circulated directly to my attention.

Thank you,

Heather Doyle
Senior Planner
Provincial and Environmental Planning Office
2nd Floor, 301 St. Paul Street
St. Catharines, Ontario
L2R 7R4

CC: "Dorton, Peter (MTO)" <Peter.Dorton@mto.gov.on.ca>

fax

GEORGIAN
YOUR COLLEGE · YOUR FUTURE

To:	Tim Collingwood	**From:**	Marty Whitney
Fax:	325-7420	**Pages:**	3
Phone:		**Date:**	April 24, 2006
Re:	Master Servicing Plan	**CC:**	

• Comments:

Mr. Collingwood,

Please find my comments attached regarding the Master Servicing Plan. Please feel free to contact me if you have any questions.

FROM THE DESK OF:

Name: Marty Whitney M.A.
Title: Program Coordinator
Dept.: Developmental Services Worker
825 Memorial Ave., Box 2316
Orillia, On.
L3V 6S2
Tel: (705) 325-2740 , ext.:3073
Fax: (705) 325-3690
E-mail: mwhitney@georgianc.on.ca

Township of Ramara
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre April 12, 2006

COMMENT SHEET

NAME: Marty Whitney

ADDRESS: [redacted] RR #7 Orillia ON. L3V 6H7

PHONE: [redacted]

☑ Please withhold my name and address from publication.

1. Did the Open House help you understand more about the project? ☑ Yes ☐ No
2. Were your questions answered to your satisfaction? ☐ Yes ☑ No

If not, please elaborate below.

please see attached.

3. Do you have any specific comments or concerns (feel free to add additional pages)?

If you wish to complete this sheet at your convenience, **please return by April 28, 2006** to:

Tim Collingwood, P.Eng.
C.C. Tatham & Associates Ltd.
50 Andrew Street South, Suite 202
Orillia, Ontario L3V 7T5
Tel: 705-325-1753
Fax: 705-325-7420

Comments can also be submitted to the Township office in Brechin.

3. Do you have any specific comments or concerns?

Please consider this an official response to the above question to be included in your report to council. During our conversation at the official public information centre of April 12, I understood you to say that this plan was created for developers. In essence, a developer knew where he/she stood when considering a project in the designated development area. At first glance this would appear to be a wise and prudent move. Upon deeper examination however, it is not apparent that this would be a wise and prudent move for the township, taxpayers or property owners.

At this time, there certainly appears to be a surplus of building lots available. That is to say, supply has exceeded demand made obvious with the difficulty in the sale of building lots in the subdivisions within the designated development area presently. The price of the lots cannot account for this phenomenon. Even though the township has indicated that they would look favourably upon development, there is nothing to indicate that a developer would reap any benefits from building a communal sewage system and recoup their costs from such a project. As noted earlier, presently there is a surplus of building lots in the designated area. To support this claim, I have had numerous discussions with developers and real estate agents since the meeting with unanimous agreement that this proposal will kill development in the designated area. In essence, this would push development to an area outside of the designated area and/or more importantly, to other growth areas outside of the township. The result would essentially end in a stagnant tax base. This appears obvious.

It would seem much more progressive to phase in such a system if that be the case. That is to say, continue development with the provision that private septic systems will connect with a communal system when available. That would still encourage growth as demand dictates while expanding the tax base to benefit all taxpayers within the township. Any infrastructure costs would be incurred by the developer as is the case now. The details of a phase in system would have to include the financial and market conditions, both present and forecasted. Again, the emphasis is an expansion of the tax base versus a stagnant tax base.

In conclusion, from an engineering perspective, ideally the proposed master servicing plan would appear positive. However, economic factors would dictate otherwise. For the township to thrive economically and expand and develop its cultural heritage, a phase in period is required to ensure fairness and practicality for all members of the township, both present and future.

Marty Whitney

Township of Ramara
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre April 12, 2006

COMMENT SHEET

NAME: Bruce Miller

ADDRESS: [redacted], Orillia L3V 6H7

PHONE: [redacted]

☐ Please withhold my name and address from publication.

1. Did the Open House help you understand more about the project? ☑ Yes ☐ No
2. Were your questions answered to your satisfaction? ☑ Yes ☐ No

If not, please elaborate below.

3. Do you have any specific comments or concerns (feel free to add additional pages)?

No, I see this as very long term development, and am pleased to see the diligence of this plan.

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Township of Ramara
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre April 12, 2006

COMMENT SHEET

NAME: Don Tom Henderson

ADDRESS: [redacted]

PHONE: [redacted]

☐ Please withhold my name and address from publication.

1. Did the Open House help you understand more about the project? ☒ Yes ☐ No
2. Were your questions answered to your satisfaction? ☒ Yes ☐ No

If not, please elaborate below.

3. Do you have any specific comments or concerns (feel free to add additional pages)?

No This Does Not Appear To Effect My Property In The Near Future. - This Meeting Would Be Of More Interest For Developers. - Nice To Know Info.

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Township of Ramara
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre April 12, 2006

COMMENT SHEET

NAME: Barry Bridgeman

ADDRESS: [redacted] Orillia / Ontario L3V 2C7

PHONE: [redacted]

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2. Were your questions answered to your satisfaction? ☒ Yes ☐ No

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Good Presentation / Staff Knowledgeable

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Township of Ramara
Atherley / Rama Road Corridor Master Servicing Plan

Public Information Centre April 12, 2006

COMMENT SHEET

NAME: BERNIE BULADING

ADDRESS: c/o GROUP AQUITAINE LIMITED

PHONE: [redacted] Markham Ont L3T 7T1

☑ Please withhold my name and address from publication.

1. Did the Open House help you understand more about the project? ☑ Yes ☐ No
2. Were your questions answered to your satisfaction? ☑ Yes ☐ No

If not, please elaborate below.

3. Do you have any specific comments or concerns (feel free to add additional pages)?

when will the final water servicing plan be adopted by the municipality?
How will the town be able to deal with development proposals that have been presented to the town before this water servicing plan becomes in effect

If you wish to complete this sheet at your convenience, **please return by April 28, 2006** to:

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C.C. Tatham & Associates Ltd.
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Orillia, Ontario L3V 7T5
Tel: 705-325-1753
Fax: 705-325-7420

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RUDY & ASSOCIATES LTD.

Planning for People, Places, and the Future

May 12, 2006

3 Pages sent by fax only

C.C. Tatham & Associates Ltd.
50 Andrew St. South, Unit 202
Orillia, ON
L3V 7T5

Attn: Tim Collingwood, P.Eng.

Re: Township of Ramara
Pt. Lot 24, Concession 9 & 10
Johnson's Draft Plan of Subdivision
Project No. 177

The landowners of the property described above are interested in developing their property. This triangular shaped property is located at the southwest intersection of Highway 12 and Muley Point Road. It is approximately 28.6 ha (70 acres) in size.

Designated & Zoned for Development within the Settlement Area:

The property is located at the eastern limit of the Atherley-Uptergrove settlement area and is subject to the Master Servicing Plan. It is designated Village in the Township of Ramara Official Plan, designated Village Residential in the Interim Secondary Plan for the Atherley/Uptergrove Secondary Plan, and zoned Village Residential/Village Commercial/Village Institutional Hold (VR/VC/VIN(H)) in the Township of Ramara Comprehensive Zoning By-law 2005.85.

Infill Development:

North of the property there are residential lots and a church, to the east there are residential lots and a school, and to the west there is the Uptergrove Estates development. The development of the subject property will fill in the neighbourhood and help create a complete community.

Completed Technical Studies:

In preparing to develop the property, the landowners have prepared an Environmental Impact Study for the property. Approximately 16.4 ha of the property is developable. A Hydrogeological Study was also completed. It was determined that the site can support between 50 and 65 lots. A Draft Plan has been prepared for the site supporting 52 future residential lots.

Large Communal System:

The subject property is located at the easterly end of the settlement area and is isolated from other developable lands. The Uptergrove Estates development is to be serviced with onsite private communal services. Servicing the Johnson property with a large (>200 lots) communal system is not a viable option.

Impact of Master Servicing Plan on Development of the Property:

The recommended servicing solution was identified at the Public Information Centre on April 12th, 2006. The recommendations of the plan indicated the subject property has been excluded from the area designated for residential development with a large communal system.

We request that the subject property be permitted to develop on private wells and septic systems. Development on the subject property is appropriate as follows:

- Development will occur in the settlement area of Uptergrove. This is consistent with the Provincial Policy Statement 2005, the County of Simcoe Official Plan, and the Township of Ramara Official Plan.

- The property is appropriately designated and zoned for future residential development in the Township planning documents.

- The background technical studies support development of the subject property on private services.

- The subject lands are of poor quality and do not represent lands of agricultural productivity.

- Development of the property will complete the development of Uptergrove. It will help to create a complete neighbourhood to bring the existing land uses together by linking the existing residential, commercial, and institutional uses.

- The derelict farm structures will be removed to improve the aesthetics of the neighbourhood.

- The wetlands identified on the subject property have been considered in the Draft plan and will be protected and conserved.

- The Draft Plan will provide for controlled and orderly development of the property.

The landowners are interested in proceeding with the development of the subject property on private services and have funded the necessary background technical studies to support development. As such, our firm will be continuing with the finalization of a complete submission to the Township for consideration.

We trust this submission is appropriate and request that we be kept informed of future meetings and/or materials available as the Master Servicing Plan is finalized.

We remain available for any questions you may have regarding this site.

Yours truly,

RUDY & Associates Ltd.

Angela Rudy

Angela M. Rudy, MCIP, RPP
Planner * Mediator

cc: Mark Dorfman, Planning Consultant - By Fax Only
Deb McCabe, Planning Administrator - By Fax Only
Highland Mills Development - By Fax Only

JONES
CONSULTING GROUP LTD.
PLANNERS, ENGINEERS, SURVEYORS

25th May 2006

VIA EMAIL

Mr. Tim Collingwood, P. Eng.
C. C. Tatham & Associates
50 Andrew Street South
Orillia, ON
L3V 7T5

Dear Tim,

Re: Rama Resorts – Destination Commercial Development (Phase 2)
Submission to Municipal Servicing Strategy
Our File: RAM-04120

We act on behalf of Martin Kiener, the owner of Part of Lots 29 and 30, Concession 12. As you may be aware, our client holds a large portion of land accessed from Fern Resort Road. These lands have been zoned Destination Commercial to accommodate a proposed 4 season resort and associated facilities as Phase 2 of development on the site.

As part of the planning process to date, communal sanitary servicing for the development has been investigated. The higher density and more intensive uses of a destination commercial development may warrant the use of point discharge to Lake Couchiching subject to necessary approvals and water quality criteria. While we understand that there may be a preference for ground infiltration from treatment facilities, we respectfully request that options be left open for the appropriate use of point discharge from higher density developments that may not have suitable soil conditions or areas available for infiltration.

As we continue to prepare for a site plan application, we look forward to working with the Township regarding servicing options. If you have any questions, please do not hesitate to contact me on 734-2538 ext. 250.

Sincerely,

THE JONES CONSULTING GROUP LTD.

Tim Cane RPP
Senior Planner, Project Manager

Copy: Deb McCabe – Township of Ramara
Martin Kiener

Transport Canada
Marine

Transports Canada
Maritime

Box 1000, 401 King St.
Prescott, Ontario
K0E 1T0

Your file Votre référence

Our file Notre référence
8200-1

May 9, 2006

Mr. Tim Collingwood, P. Eng.
C.C. Tatham & Associates Limited
50 Andrew Street South, Unit 202
Orillia, ON L3V 7T5

Dear Sir:

Re: Township of Ramara, Atherley Secondary Plan Area/Rama Road Corridor, Master Servicing Plan, Province of Ontario

Reference is made to your letter concerning a Public Information Centre regarding the above.

Attached for your assistance is a copy of our Application Guide.

It is suggested that all correspondence in connection with an application under the Act be forwarded to the following;

Transport Canada
Marine Safety
100 Front Street South
Sarnia, ON N7T 2M4
Attn: Barry Putt

If you have any questions, please contact me or view additional materials on our web site http://www.tc.gc.ca/marinesafety/Ships-and-operations-standards/nwp/menu.htm .

Yours truly

A. Robertson
Navigable Waters Protection Officer
Transport Canada - Prescott Base

Attach

cc. Regional Office – Sarnia

Canada

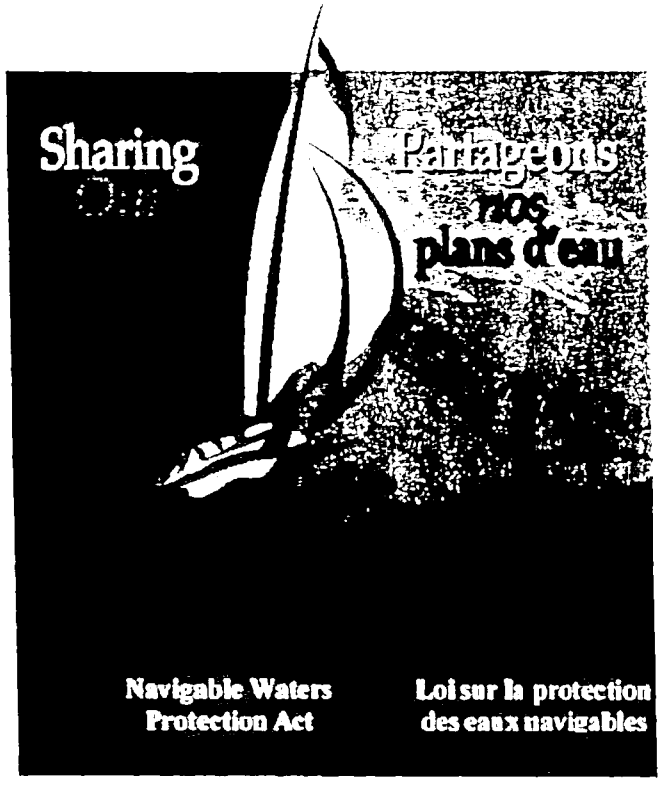
Transport Canada
Marine

Transports Canada
Maritime

Ontario Region
&
Prairie & Northern Region

NAVIGABLE WATERS PROTECTION ACT

APPLICATION GUIDE



Navigable Waters Protection
100 Front Street South
Suite 703
Sarnia, Ontario, N7T 2M4

Phone (519) 383-1865 Fax (519) 383-1989

Canada

APPLICATION GUIDE CHECKLIST

Before returning your application form, the following **must** be included otherwise your application will not be processed:

- ☐ Name of property owner & description of the project site
- ☐ Complete mailing address of the property owner
- ☐ Plot or survey plan with project shown & adjacent landowners
- ☐ Map or chart with arrow to show location of project
- ☐ Plan view of the project (with dimensions)
- ☐ Side view of project (with dimensions)
- ☐ Location for disposal of dredge spoils (if applicable)
- ☐ Name of the contractor/firm doing the work (if applicable).

APPLICATION GUIDE

INTRODUCTION

The Navigable Waters Protection Act (NWPA) revised Statutes of Canada, 1985, is one of the oldest pieces of federal legislation. It first became law on May 17, 1882. The principle objective is to protect the public right of navigation by prohibiting the building or placement of any "work" in, upon, over, under, through, or across a navigable water without the authorization of the Minister of Transport. The jurisdiction of the legislature begins at the high water mark. Therefore structures that are between low and high water marks will require approval under the NWPA. The administration of the NWPA was recently transferred to Transport Canada.

Important Notice

An approval granted by the Minister is neither a general approval of construction nor an authorization in respect of any law, excepting the Navigable Waters Protection Act. An authorization may also be required from the Minister under the Fisheries Act; you should contact the Department of Fisheries & Oceans for such a determination. In addition, contact should also be made with local municipal, provincial and other government offices to determine if other approvals will be required for the proposal.

What is a Navigable Waterway?

A navigable water is any body of water capable of being navigated by floating vessels of any description for the purpose of transportation, commerce or recreation. This includes both inland and coastal waters. The authority to determine the navigability of a waterway and consequently the requirement for an application under the NWPA, rests with the Minister of Transport or his/her designated representative.

Examples of Some Types of "Works" Requiring Authorization

- any bridge, boom, dam, causeway, wharf, dock, boathouse, intake, outfall, etc.;
- dredging; dumping of fill, retaining wall, groyne, breakwater;
- submarine or overhead cables, tunnel, pipeline;
- aquaculture facilities;
- any other device, structure, or thing whether similar in character to the above or not.

Permit Process

There are basically two types of processes followed in reviewing an application under the Act:

- **Formal Approval**
  The formal approval process is followed when NWPA officials determine that your work or project poses a substantial interference with navigation. Under the requirements of the Act all bridges, booms, dams, and causeways must be processed by formal approval.

- **Letter of Exemption**
  The exemption process is followed when NWPA officials determine that your work or project does not pose a substantial interference with navigation.

How to Make an Application

1. **Application Form** - Complete, sign and date the enclosed application form.

2. **Site Location** - Obtain 6 copies of a map or topographic chart of your area. Please include enough details to simplify the location of the proposed project. If not already shown, add the following:
   - Name of the waterbody in which the project is located;
   - Location of the proposed project (draw an arrow showing the exact location of the site on the map);
   - Approximate latitude and longitude of the project

3. **Plot Plan** - One (1) copy of your plot or survey plan, showing adjacent property owners (include names), with the location of the proposed work clearly indicated.

4. **Plan View (6 copies)** - The plan view shows the proposed project as if you were looking straight down on it from above. Provide these drawings, to scale or dimensioned, containing sufficient detail to clearly show your proposed project, including:
   - Any existing works presently on your property or adjacent properties such as docks, slipways, breakwaters etc.;
   - Existing shorelines;
   - Dimensions (length, width, etc.) of the project All dimensions should be from the ordinary high water mark.. See sample sketches for further details:
   - Average water depth around the project;
   - Scale of drawing.
   - North arrow.

5. **Profile View or Section View (6 copies)** - The profile view is a scale drawing that shows the side, front, or rear of the proposed structure as it would look if you were standing to the side of it; the section view is a scale drawing that shows the proposed structure as it would look if sliced internally for display. Clearly show the following:
   - Dimensions of the project, including width, height etc. See the sample sketches for further details;
   - The ordinary high water mark (O.H.W.M.) and high water mark (H.W.M.);
   - Existing and proposed ground contours;
   - Height above the bed of the waterway;
   - The type of construction material to be used;
   - Scale;

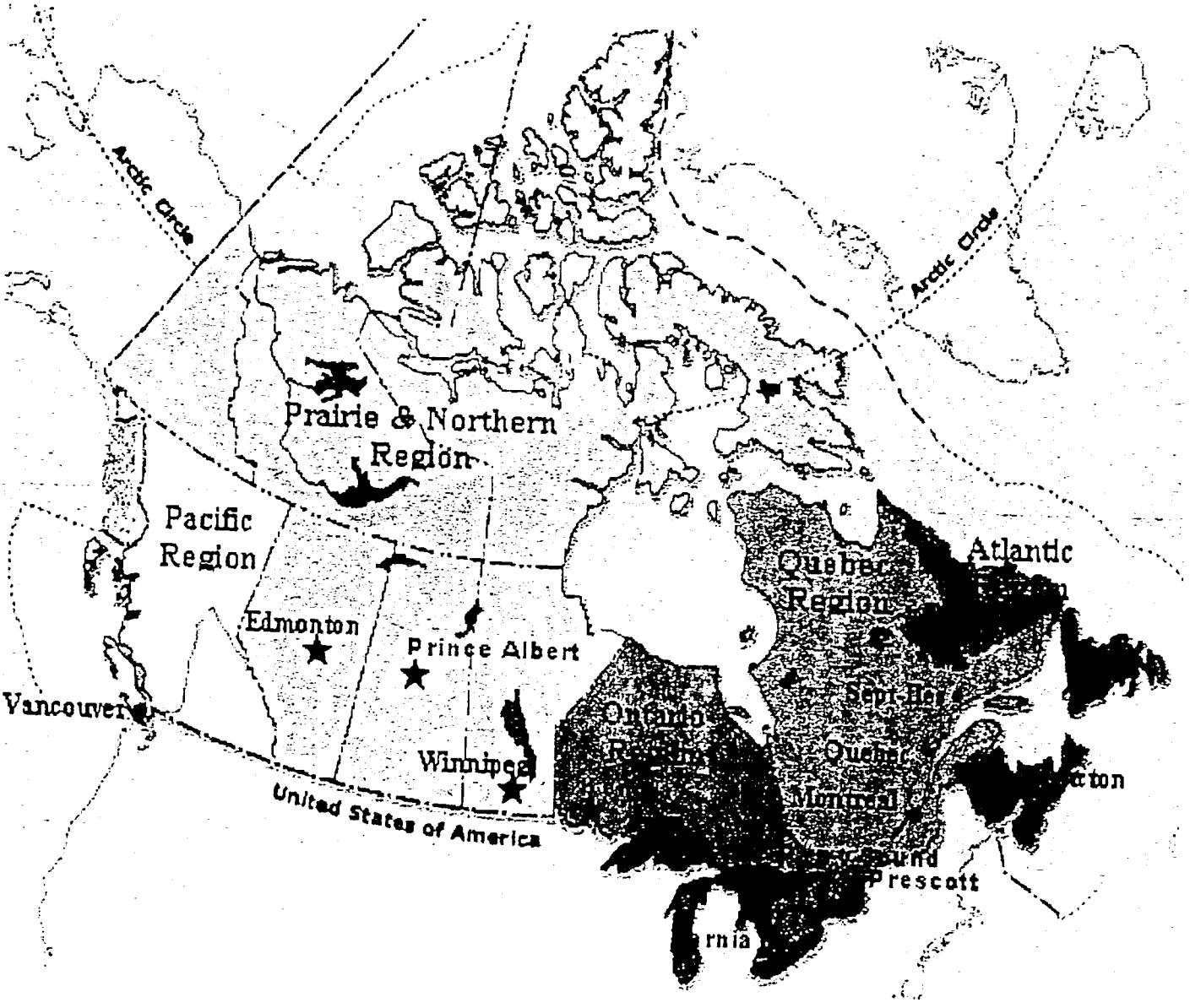
Other information

a) If any information is missing, your application may be delayed; therefore please ensure that your application, plans, etc. are complete.
b) Please be advised that it is recommended that applications for approval under the NWPA be made well in advance of the anticipated start-up date, to allow Coast Guard officials to do a complete investigation and possible environmental assessment of your project, which may take several months.
c) Advise whether you have received or applied for a waterlot lease or permit, and if so, with whom you have applied and when.
d) Provide a proposed construction schedule, advising when you plan on starting the project.
e) If you are not the upland owner, provide the owners consent in writing.
f) Provide an environmental assessment or study if one has been prepared.

Where to Make an Application

In accordance with the map below, please submit applications for approval to the addresses listed on Annex A "Navigable Waters Protection Act Application Addresses".

Ontario Region & Prairie & Northern Region
NWP PROGRAM – AREA OFFICES



Navigable Waters Protection Act
Request for Project Review

Is this the first time you are requesting a review for this project?		
Yes ☐	No ☐	

Section A — Proponent / Owner /Other Information

Name of Proponent/Owner:		
Mailing Address:		
Street Address (if different than above):		
City/Town:	Province/Territory:	Postal Code:
Tel. No. (Residence):	Tel. No. (Work):	Tel. No.: (Other)
Fax No:	E-mail Address:	
Name of Contractor/Agency/Consultant (if applicable):		
Mailing Address:		
Street Address (if different than above):		
City/Town:	Province/Territory:	Postal Code:
Tel. No. (Residence)	Tel. No. (Work):	Tel No. (Other)
Fax No.	E-mail Address:	

Section B — Location of the project and physical description of the site

Name of Nearest Community (*City, Town, Village*):	Municipality / District / County:
Legal Description (Lot, Concession, Township, Section, Range):	Name of Primary Watercourse (River, Lake, Bay)
Access Road to Proposed Work Site (e.g., *route number, highway series number or street name/number if urban area, etc.)*	
Topographic/Chart No. (if applicable)	Water lot Lease or Permit (if applicable)
Description of shoreline, if applicable *(i.e., ground type, vegetation, slope, other)* *Note: Enclose photographs*	Description of watercourse *Note: Enclose photographs:*
Average width and depth of waterway at the project site:	Type of navigation (recreational/commercial):

Section C — Description of Project (Please attach additional information – see Section D)

What is the proposed project? *(dock, dam, bridge, aquaculture site, etc.)* *Note: Detailed description of work must be attached*	
Proposed Start Date:	Proposed Completion Date:
Status of the Project (circle): New Existing Addition Repair	Is the work permanent or temporary?

Section D — What to send to Navigable Waters Program with Request for Project Review

Attach the following documents/information:

- Detailed project description with construction schedule
- Detail of any temporary works and method of construction activities
- Property ownership status (if you are not the owner, attach a letter of permission from the owner)
- Map or chart to show location of project (6 copies)
- Sketch or drawing of project, including side and top view and showing dimensions of the project (6 copies)
- Survey plan or sketch with dimensions indicating the location of existing buildings, shoreline structures, property lines, high and low water marks, and adjacent properties
- Current photographs of the proposed work site (photos of open water period where possible)
- A list of any equipment that may be used during the project

Date:	Signature:
For NWPA Use only:	
NWPA #:	

Annex A
Navigable Waters Protection Act
Application Addresses

To apply for approval of works or for additional inquiries about the Navigable Waters Protection Act or Program, please contact the appropriate office below.

NWP Regional Office - South Western Ontario, Nunavut & Northwest Territories

Navigable Waters Protection Program
100 Front Street South
Sarnia, ON
N7T 2M4

NWPA Prescott Office - Eastern Ontario

Navigable Waters Protection Program
P.O. Box 1000
401 King St. W
Prescott, ON K0E 1T0

NWPA Parry Sound Office - North Eastern Ontario

Navigable Waters Protection Program
28 Waubeek St.
Parry Sound, ON P2A 1B9

NWPA Kenora Office - North Western Ontario

Navigable Waters Protection Program
P.O. Box 649
1100 3rd Ave. S
Kenora, Ontario P9N 3X6

NWP Winnipeg Office - Manitoba

Navigable Waters Protection Program
Freshwater Institute
501 University Crescent
Winnipeg, MB R3T 2N6

NWP Prince Albert Office - Saskatchewan

Navigable Waters Protection Program
125 - 32nd Street West
Prince Albert, SK S6V 7H7

NWP Edmonton Office - Alberta

Navigable Waters Protection Program
4253 - 97th Street
Edmonton, AB T6E 5Y7

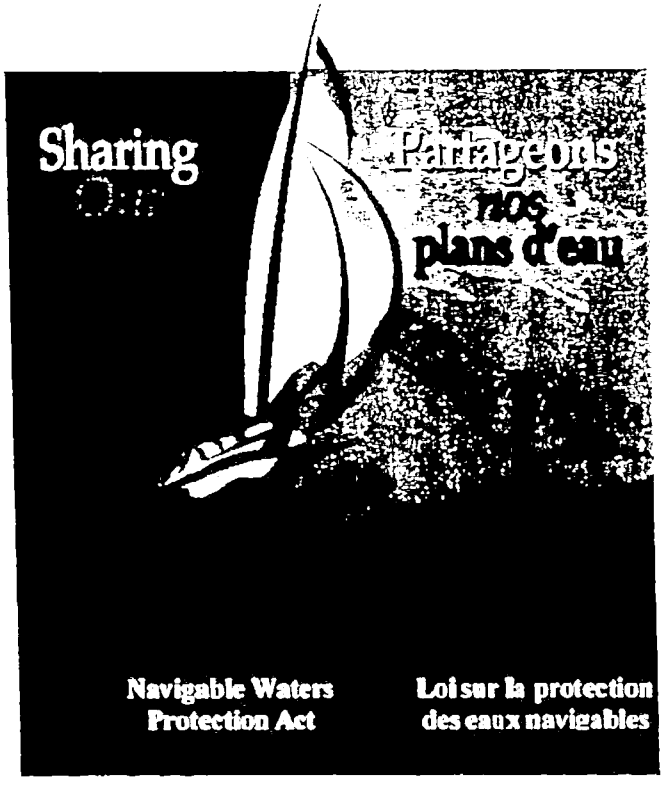
Transport Canada
Marine

Transports Canada
Maritime

Ontario Region
&
Prairie & Northern Region

NAVIGABLE WATERS PROTECTION ACT

APPLICATION GUIDE



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Other information

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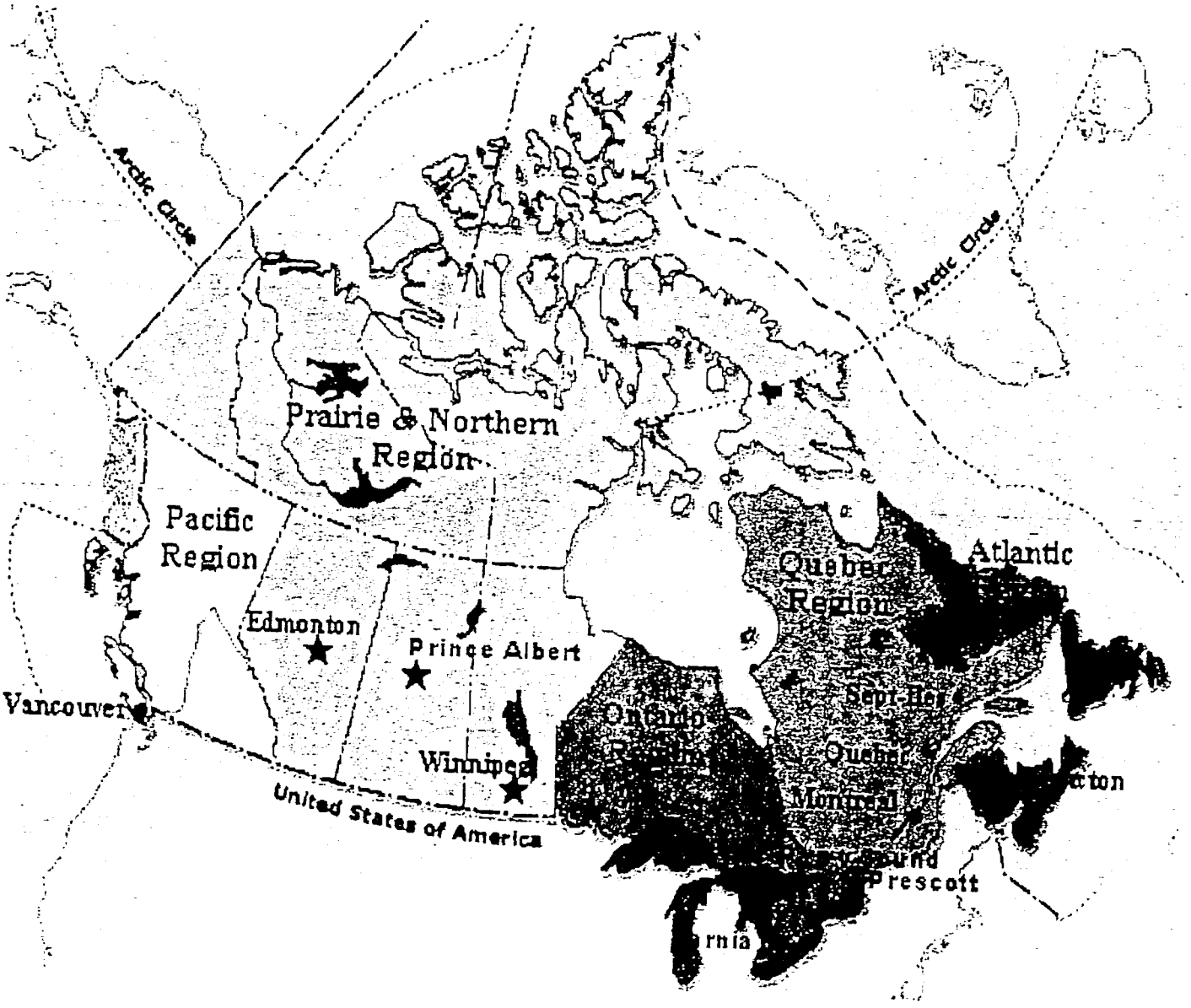
In accordance with the map below, please submit applications for approval to the addresses listed on Annex A "Navigable Waters Protection Act Application Addresses".

Ontario Region & Prairie & Northern Region
NWP PROGRAM – AREA OFFICES



Navigable Waters Protection Act
Request for Project Review

Is this the first time you are requesting a review for this project?			
Yes ☐	No ☐		

Section A — Proponent / Owner /Other Information

Name of Proponent/Owner:		
Mailing Address:		
Street Address (if different than above):		
City/Town:	Province/Territory:	Postal Code:
Tel. No. (Residence):	Tel. No. (Work):	Tel. No.: (Other)
Fax No:	E-mail Address:	
Name of Contractor/Agency/Consultant (if applicable):		
Mailing Address:		
Street Address (if different than above):		
City/Town:	Province/Territory:	Postal Code:
Tel. No. (Residence)	Tel. No. (Work):	Tel No. (Other)
Fax No.	E-mail Address:	

Section B — Location of the project and physical description of the site

Name of Nearest Community (*City, Town, Village*):	Municipality / District / County:
Legal Description (Lot, Concession, Township, Section, Range):	Name of Primary Watercourse (River, Lake, Bay)
Access Road to Proposed Work Site (e.g., *route number, highway series number or street name/number if urban area, etc.)*	
Topographic/Chart No. (if applicable)	Water lot Lease or Permit (if applicable)
Description of shoreline, if applicable *(i.e., ground type, vegetation, slope, other)* *Note: Enclose photographs*	Description of watercourse *Note: Enclose photographs*
Average width and depth of waterway at the project site:	Type of navigation (recreational/commercial):

Section C — Description of Project (Please attach additional information – see Section D)

What is the proposed project? *(dock, dam, bridge, aquaculture site, etc.)* *Note: Detailed description of work must be attached*	
Proposed Start Date:	Proposed Completion Date:
Status of the Project (circle): New Existing Addition Repair	Is the work permanent or temporary?

Section D — What to send to Navigable Waters Program with Request for Project Review

Attach the following documents/information:

- Detailed project description with construction schedule
- Detail of any temporary works and method of construction activities
- Property ownership status (if you are not the owner, attach a letter of permission from the owner)
- Map or chart to show location of project (6 copies)
- Sketch or drawing of project, including side and top view and showing dimensions of the project (6 copies)
- Survey plan or sketch with dimensions indicating the location of existing buildings, shoreline structures, property lines, high and low water marks, and adjacent properties
- Current photographs of the proposed work site (photos of open water period where possible)
- A list of any equipment that may be used during the project

Date:	Signature:
For NWPA Use only:	
NWPA #:	

Annex A
Navigable Waters Protection Act
Application Addresses

To apply for approval of works or for additional inquiries about the Navigable Waters Protection Act or Program, please contact the appropriate office below.

NWP Regional Office - South Western Ontario, Nunavut & Northwest Territories

Navigable Waters Protection Program
100 Front Street South
Sarnia, ON
N7T 2M4

NWPA Prescott Office - Eastern Ontario

Navigable Waters Protection Program
P.O. Box 1000
401 King St. W
Prescott, ON K0E 1T0

NWPA Parry Sound Office - North Eastern Ontario

Navigable Waters Protection Program
28 Waubeek St.
Parry Sound, ON P2A 1B9

NWPA Kenora Office - North Western Ontario

Navigable Waters Protection Program
P.O. Box 649
1100 3rd Ave. S
Kenora, Ontario P9N 3X6

NWP Winnipeg Office - Manitoba

Navigable Waters Protection Program
Freshwater Institute
501 University Crescent
Winnipeg, MB R3T 2N6

NWP Prince Albert Office - Saskatchewan

Navigable Waters Protection Program
125 - 32nd Street West
Prince Albert, SK S6V 7H7

NWP Edmonton Office - Alberta

Navigable Waters Protection Program
4253 - 97th Street
Edmonton, AB T6E 5Y7

Transport Canada
Marine

Transports Canada
Maritime

RECEIVED MAY 2 4 2006

Box 1000, 401 King St.
Prescott, Ontario
K0E 1T0

Your file Votre référence

Our file Notre référence
8200-1

May 16, 2006

C.C. Tatham & Associates Ltd.
50 Andrew Street South, Unit 202
Orillia, ON L3V 7T5

Attn: T. Collingwood, P .Eng.

Dear T. Collingwood:

Atherley/Rama Road Corridor Master Servicing Plan – Public Information Centre

Reference is made to your letter of April 24, 2006 concerning the above.

Please be advised that any construction in a navigable body of water is subject to the provisions under the Navigable Waters Protection Act. For your assistance we have attached an Application Guide, which will assist you in making an application under the Navigable Waters Protection Act.

It is suggested that all correspondence in connection with an application under the Act be forwarded to the following;

Transport Canada
Marine Safety
100 Front Street South
Sarnia, ON N7T 2M4
Attn: Barry Putt

If you have any questions, please contact me at 613-925-1934, or view additional materials on our web site http://www.tc.gc.ca/marinesafety/Ships-and-operations-standards/nwp/menu.htm .

Yours truly,

A. Robertson
NWP Officer
Transport Canada - Prescott Base

Attach.

Canada

APPENDIX C:
ENVIRONMENTAL CONDITIONS/PHOSPHORUS MANAGEMENT
(MICHALSKI NIELSON ASSOCIATES LIMITED)

MASTER SERVICING PLAN

ENVIRONMENTAL CONDITIONS/ PHOSPHORUS MANAGEMENT

ATHERLEY/UPTERGROVE SECONDARY PLAN AREA/ RAMA ROAD CORRIDOR

Prepared for: Township of Ramara

June 2006

Michalski Nielsen
ASSOCIATES LIMITED

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APPENDIX B – SUMMARY OF PHOSPHORUS EXPORT COEFFICIENTS

1 INTRODUCTION

1.1 Background

The Township of Ramara is facing development pressures in the Atherley/Uptergrove Secondary Plan Area and the Rama Road Corridor, largely related to expanding development from the Casino on Rama Road. Of importance is that the Official Plan for the Township allows for possible development in the Study Area (**Figure 1**). At the same time, the Province of Ontario is concerned about additional growth occurring in the Lake Simcoe watershed, and to a lesser extent in the watershed of Lake Couchiching; the primary environmental concern relates to negative water quality impacts in these highly important south-central Ontario lakes. To address and accommodate these potential conflicts, the Township of Ramara initiated in early 2005 a **Master Servicing Plan for the Atherley/Uptergrove Secondary Plan Area/Rama Road Corridor (MSP)**. Its purpose was to determine an environmentally sensitive and sustainable solution to servicing development (i.e., private, communal, municipal or a combination). The **MSP** was undertaken in accordance with the guidelines and requirements for Phase 1 and Phase 2 of the Municipal Class Environmental Assessment Process (Municipal Engineers Association, 2001), which is an approved process under the *Environmental Assessment Act*.

Given the above, Michalski Nielsen Associates Limited was retained to undertake an environmental/land use evaluation of the Study Area, to be used in the selection of a preferred servicing alternative. This component of the overall project focuses on:

- identifying the extent and character of the Study Area's biological and physical resources;
- determining the significance of its natural heritage features; and
- evaluating the types of site servicing to mitigate potential detrimental effects on such resources, and particularly surface water quality of Lake Simcoe and Lake Couchiching.

Within the context of the above, Michalski Nielsen Associates Limited examined the issue of phosphorus loadings from the Study Area. Phosphorus is a non-metallic element which occurs in dissolved and particulate, organic and inorganic forms in water, and is virtually non-toxic to aquatic life. In lakes and rivers, it is the principle nutrient limiting plant growth[1], and is part of the cycle of nature. However, it is also present in human and domesticated animal wastes, farm and industrial waste water, and a variety of products, such as soaps and fertilizers, all of which end up in sanitary waste treatment systems, or in stormwater runoff.

In the 1970s, Lake Simcoe and Lake Couchiching were linked in the Lake Simcoe Environmental Management Strategy (LSEMS), a provincial initiative that started with the objectives of determining the causes, consequences and cures for the lake's problems of artificial or man-made eutrophication. However, over time, the lakes were somehow disconnected and more emphasis was placed on Lake Simcoe. After considerable study, the LSEMS team determined that the key factor causing the problem was that too much phosphorus was being loaded to Lake Simcoe on an annual basis. The main sources of this pollutant were and continue to be: the atmosphere; tributaries; urban stormwater runoff; treated sewage from fourteen sewage treatment plants; the vegetable polders (i.e., the Holland Marsh); and septic

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[1] Eutrophication is the natural aging of a body of water caused by the inflow of too much nutrients. Although all lakes and rivers age from a young, productive state, in nature this eutrophication takes many thousands of year. European settlement and development have caused many lakes including the Lower Great Lakes and portions of the Upper Great Lakes, the Bay of Quinte, and some of the lakes within the Kawartha/Trent/Rideau waterway to age much faster over the last two centuries.

tank tile field systems. In 1985, the LSEMS team recommended a no net increase in phosphorus loadings to the lake. Since that time, there have been no new sewage treatment plants discharging either directly or indirectly to Lake Simcoe.

This strategy brought about some improvements to water quality in the lake and health of the overall system. However, not enough changes occurred, particularly to deep-water concentrations of dissolved oxygen which support mid-summer deep-water species of fish such as lake trout and lake whitefish. More recently, the environmental protection agencies led by the LSEMS team proposed an objective of reducing phosphorus entering the lake. This was a very substantial change from the previous no net increase policy, although this target is likely to be further reduced as a consequence of the Province's recent **Intergovernmental Action Plan for Simcoe, Barrie and Orillia (IGAP)** initiative. The current proposal is to reduce phosphorus loadings from about 102 tonnes/year to 75 tonnes/year.

More recently, land developers, in their applications for approval, have been responding to the above by applying a Total Phosphorus Management (TPM) concept (which is a LSEMS initiative). It means when a development is completely built out, there will be less phosphorus entering a lake than at present. Application of the TPM includes not only better control of phosphorus from treated sewage, but from stormwater runoff as well, both urban and agricultural. The net effect is one that relates to public good, because not only are there improvements in water quality, but economic and social benefits as well.

A key feature of the TPM evaluatory process relates to the preparation of pre and post development phosphorus budgets, as follows.

1. Estimation of present day annual phosphorus loads to downgradient surface waters from proposed lands to be developed.

2. Prediction of how the phosphorus loads may change after the development is completed.

3. Prediction of how land-based phosphorus loads may be reduced through design and applying a variety of Best Management Practices.

4. Prediction of how loadings of phosphorus can be reduced by the use of appropriate sewage treatment technology.

5. Estimation of net benefits by subtracting the sum of 3 and 4 from 1.

The TPM approach is not precedent setting in Ontario: examples demonstrating its application to achieve a balance of environmental social and economic benefits include: the Township of Severn – West Shore Waste Water Sewage Treatment Plant (Lake Couchiching); Big Bay Point Resort Development (Lake Simcoe): and North Shore Road Sewer Extension, Lake Kashagawigamog, Municipality of Dysart et al.

The TPM approach, which is presented herein, was applied to the Study Area, constituting one of a number of components in evaluating servicing options, the others being socio-economic, public health and costs.

In keeping with the above, this report is divided into the following sections.

- **Approach**, which describes the specific methodologies to collect and analyze the data base.
- **Inventory Results**, that provides brief descriptions of the regional biophysical setting, and information on the character and distribution of terrestrial and aquatic features occurring on the subject property.
- **Resource Evaluation**, which assesses the ecological significance of the Study Area's natural heritage features.
- **Servicing Options – Phosphorus Loadings**, that applies a TPM approach to quantify phosphorus inputs to downgradient surface waters.

1.2 Acknowledgements

David Cunningham, Terrestrial Ecologist, undertook the field inventory and evaluation of the Study Area's natural heritage features, mapped and described land uses as background for a pre-development phosphorus budget, and prepared related text, Michael Michalski, Limnologist and Senior Advisor, participated in the field investigations, and carried out an analysis of existing overland phosphorus loadings for the four areas within the overall study area for which sewage and water servicing could be provided.

2 APPROACH

2.1 Collection and Review of Background Data

In preparing this environmental evaluation, second-hand file data pertaining to the natural heritage (environmental) features of the Atherley/Uptergrove Secondary Plan Area and Rama Road Corridor was collected from the Ministry of Natural Resources (MNR), County of Simcoe and Township of Ramara. The Study Area included all lands and watercourses within the subwatershed boundary of Lake Couchiching to the north of Highway 7-12 and Lake Simcoe to the south of Highway 7-12 in the Atherley/Rama/Uptergrove sections. Data sources included official plan designations (i.e., land use schedules), stream and fisheries assessments, natural resource value maps, floral and faunal surveys, Life Science and Earth Science Areas of Natural and Scientific Interest (ANSIs), wetland evaluations, Forest Resource Inventory (FRI) maps, fish, dot maps, and endangered, threatened or extirpated (ETEs) flora and fauna. All data were reviewed and assisted in the mapping of existing natural environmental features and current land uses, the determination of resource significance, and identification of potential site opportunities and constraints.

Copies of National Topographic Series of maps (1:50,000), Ontario Base Maps (OBMs – scale 1:10,000), and mosaic of coloured infrared aerial photos (1997-1998) were reviewed to provide a general knowledge of the types and locations of natural features (e.g., forested stands, watercourses, wetlands), agricultural cropland and pastureland (e.g., hay, soybean, corn, clover, fallow). In addition to the file material obtained from the MNR, County and Township, various published natural environmental reports and official plan designations for the Study Area were reviewed. They included the following.

- **Life Science Areas of Natural and Scientific Interest in Site District 6-6. A Review and Assessment of Significant Natural Areas in Site District 6-6** (Hanna 1984)
- **Natural Heritage Resources of Ontario: Bibliography of Life Science Areas of Natural and Scientific Interest (ANSIs) in Ecological Site Regions 6E and 7E, Southern Ontario** (Riley *et al.* 1997)
- **Mud Lake Wetland Complex Evaluation, Data Record and Map** (Black, Simkin and Purves 1984)
- **McPhee Bay Wetland Complex Evaluation, Data Record and Map** (Black, Simkin, Gillespie and Ferguson 1984)

- **Sucker Creek Wetland Evaluation, Data Record and Map** (Gillespie and Simkin 1984)
- **Atherley Narrows Wetland Complex Evaluation. Data Record and Map** (Simkin and Gillespie 1984)
- **Atherley Wetlands Complex** (Medd 1995)
- **Biological Inventory of the Mud Lake Wetland Complex – Rama and Mara Townships, Simcoe County** (Bowles and Sober Environmental Consultants 1991).

The County of Simcoe and the Natural Heritage Information Centre (NHIC) dataquery web sites were also consulted for information on greenland systems, forest cover, lakes, streams and creeks, ETEs, significant natural area descriptions, and site element occurrence records (County of Simcoe 2005 and NHIC 2005). The environmental and land use schedules and policies of the County of Simcoe Official Plan and Township of Ramara Official Plan were also reviewed as to their applicability to the Study Area (County of Simcoe 1998 and Township of Ramara 2003) . The Ontario Breeding Bird Atlas (OBBA) web site was reviewed for data on typical and rare breeding birds in the Study Area (Birds Ontario 2001 – 2005).

No site or area specific sampling was undertaken to determine water quality conditions in Lake Couchiching, because excellent accounts (i.e., water quality, phytoplankton, zooplankton, trophic status, etc.) have recently been published (**Water Quality Status for Lake Couchiching 2003**, Severn Sound Association [2005] and Michalski Nielsen Associates Limited [2006]). Relevant information was synthesized from these documents and is presented herein. Similarly, water quality conditions in Lake Simcoe have been well documented: information presented herein was taken from Michalski Nielsen Associates Limited (2005).

2.2 Agency Contacts

Personal contacts were made with the following individuals for second-hand file information on natural environmental resources of the Study Area.

$ Ms. Kathy Woeller, District Planner – MNR Midhurst Office for provincial policies regarding wetlands, wetland evaluations, data records and maps.

- $ Mr. Gary Allen, District Ecologist – MNR Midhurst Office, for wetland evaluations, data records and maps, deer wintering yard maps, ANSI and significant areas descriptions, and ETEs.
- $ Mr. Brad Allan, Fisheries Biologist – MNR Midhurst Office, for stream and lake surveys, fish.dot inventories and maps, and forest resource inventory maps.
- $ Mr. Donald Sutherland, Zoologist and Mr. Michael Oldham, Botanist and Herpetologist – Natural Heritage Information Centre (NHIC), for data on plants, birds, mammals, amphibians and reptiles, significant site element records and natural areas, and ETEs.

2.3 Base Mapping

Prior to undertaking the site inspections and inventories, copies of coloured infrared aerial photographs (1997-1998, scale 1:10,000) were obtained and interpreted. Individual aerial photographs were combined into a mosaic to provide complete coverage for the subwatersheds of Lake Couchiching and Lake Simcoe within the Study Area.

2.4 Site Inspection and Inventory

The site was inspected and inventoried on various dates from June to October, 2005 under varying conditions. The types of natural environmental features within the Study Area were documented through qualitative (descriptive) sampling techniques. Attributes pertaining to vegetation communities and floristics, wildlife, topography, drainage, aquatics and fisheries were noted, described and mapped. A photographic record of representative vegetation communities, forested stands, agricultural cropland and pastureland, anthropogenic features and current developed land uses (e.g. commercial, industrial, institutional, aggregate extraction, recreational) was also compiled and mapped.

2.4.1 Vegetation Communities and Floristics

The classification of the Study Area vegetation communities were characterized according to species composition and physiognomic characteristics. The nomenclature for the flora observed is consistent with the following authorities:

X Lycopodiaceae to Aspleniaceae – Cody, W. J., and D. F. Britton. 1989. **Fern and Fern Allies of Canada.** Publication 1829/E, Agriculture Canada, Research Branch. Ottawa.

X Taxaceae to Orchidaceae – Voss, E. G. 1972. **Michigan Flora. Part 1: Gymnosperms and Moncots.** Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 55.

X Saururaceae to Cornaceae – Voss, E. G. 1985. **Michigan Flora. Part 2: Dicots.** Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 59.

X Pyrolaceae to Compositae – Voss. E. G. 1996. **Michigan Flora. Part 3: Dicots.** Cranbrook Institute of Science and University of Michigan Herbarium. Bulletin 61.

X Newmaster, S. G., A. Lehela. P. W. C. Uhlig. S. McMurray, M. J. Oldham, and Ontario Forest Research Institute. 1998. **Ontario Plant List.** Forest Research Information Paper No. 123.

2.4.2 Wildlife and Wildlife Habitat

All incidental wildlife species noted within the Study Area were recorded. Evidence of presence was determined from direct sightings and indirectly from calls. nests. tracks, burrows. browse and scats. Wildlife groups inventoried included birds, mammals. amphibians and reptiles. Data for typical and rare breeding bird species in this geographic region and the Study Area shorelines of Lake Couchiching and Lake Simcoe was obtained from the OBBA web site to supplement the field survey data.

2.4.3 Aquatic Environment and Fish Habitat

There are no permanent watercourses in the Study Area, only intermittent swales and ditches. Locations and extent were noted and mapped in-situ. The shorelines and open waters of Lake Couchiching and Lake Simcoe within the Study Area were not inventoried for fish. with fish and fish habitat data garnered from sources such as the MNR and internet web sites. As mentioned earlier. information on Lake Couchiching water quality characteristics was obtained from **Water Quality Status of Lake Couchiching 2003** (Severn Sound Environmental Association [2005]) and Michalski Nielsen Associates Limited (2005). and from Michalski Nielsen Associates Limited (2006) for Lake Simcoe.

3 INVENTORY RESULTS

3.1 Soils

To prepare a phosphorus budget for parts of the Study Area. it is necessary to be knowledgeable about soil conditions. The following information was synthesized from the Ontario County soils map. It shows the Study Area to contain primarily:

- imperfectly drained, essentially stone-free, slightly calcareous lacustrine clay loam: and
- well drained calcareous grey loam and sandy loam till. with secondary components of:
  - well drained non-calcareous sandy loam; and
  - muck.

More specifically, the **Soil Survey Report No. 23, Soils of Ontario County (Part of Municipality of Durham and Simcoe County) North Half** (A.B. Olding. R.E. Wicklund and N.R. Richards) describes the soils in the Study Area. as follows.

1. **Lovering Clay Loam (Lcl)**: Taken directly from the Soil Survey:
   The Lovering series is imperfectly drained and is developed from slightly calcareous lacustrine deposits . The upper layer of topsoil is shallow and somewhat mottled. The Lovering soils occur in Mara and Rama Townships in Ontario County. The topography on which the Lovering series occurs ranges from level to gently sloping. The internal and external drainages are both imperfect. The soil is essentially stonefree.

   A cultivated profile has the following characteristics:

   A_c 0 – 6 inches brown (10 YR 5/3) clay loam; coarse crumb structure; very friable consistency; pH – 5.0.

   A_z 2 – 6 – 11 inches light grey (10 YR 7/1) clay loam: mottled: platy structure: friable consistency; pH – 4.8.

   B 11 – 18 inches yellowish brown (10 YR 5/4) clay. mottled; medium to large subangular blocky structure: pH – 6.0.

C Brownish yellow (10 YR 6/6) clay ; plastic consistency; pH – 6.2.

There is some range in reaction within the soil series. The surface reaction ranges from approximately pH – 5.0 to pH – 6.0, and the reaction of the parent material ranges from pH – 6.0 to pH – 6.8.

2. **Otonabee Loam (Osl).**

The Otonabee soil is developed from a loam and sandy loam till. The parent material is very calcareous and contains many limestone fragments. These soils occupy an area of approximately 44,100 acres in the central part of Ontario County. The topography ranges from smooth very gently sloping to smooth steeply sloping but the steeper slopes are more common. The soils are well drained both internally and externally. Stones and boulders are very common but can be removed easily.

A profile description is as follows:

Ao Thin layer of partially decomposed leaf litter.

A_1 0 – 4 inches very dark greyish brown (10 YR 3/2) loam: fine crumb structure: very friable consistency; stony; calcareous: pH – 7.6.

B_1 4 – 8 inches pale brown (10 YR 6/3) loam: weak fine subangular blocky structure; very friable consistency; stony; calcareous; pH – 7.4.

B_2 8 – 16 inches dark brown (10 YR 4/3) clay loam; medium subangular blocky structure: firm consistency: stony; calcareous; pH – 7.6.

C Light brownish grey (10 YR 6/2) loam till: very stony: calcareous; pH – 8.0.

3. **Wendigo Sandy Loam (Wes).**

These soils are only encountered in the southern section of the Study Area. "The Wendigo soils are developed from coarse outwash materials. The topography on which the Wendigo series occurs is gently sloping to very gently sloping. Because of the coarse. open nature of the soil, the drainage is very good.

A cultivated profile has the following characteristics:

A_c 0 – 6 inches dark brown (10 YR 4/3) sandy loam; fine crumb structure; extremely friable consistency; pH – 6 .0

B_{21} 6 – 14 inches yellowish brown (10 YR 5/8) sand: weak crumb structure: very friable consistency; pH – 5.6

B_{22} 14 – 30 inches brownish yellow (10 YR 6/6) sand; weak crumb structure; very friable consistency: pH – 6.0

C Pale brown (10 YR 6/3) sand; pH – 6.0.

4. **Muck (M).**

Muck soils are very variable in composition, depending on the vegetation from which they were formed. They vary also in reaction, but are generally neutral or slightly alkaline .

The following description of a muck soil indicates the arrangement of layers:

(1) 0 – 9 inches very dark greyish brown (10 YR 3/2) well decomposed organic material derived from sedges, swamp forest, and grasses; pH – 7.2.

(2) 9 – 15 inches more woody materials and less well decomposed: pH – 6.8.

(3) 15 – 24 inches very dark brown (10 YR 2/2) well decomposed sticky material.

(4) Clay, till, sand or bedrock.

The topography is usually depressional to level . The drainage is very poor, the water table being high most of the year. The vegetation consists of swamp elm, white cedar, and willow sedges.

5. **Atherley Clay Loam (Aycl).**

The Atherley series is the poorly drained member of the Medonte catena. These soils are developed from slightly calcareous lacustrine materials that are sometimes varved. The profile is mottled and gleyed. The Atherley series occurs in Mara and Rama Townships.

A cultivated profile has the following characteristics.

A_c 0 – 9 inches very dark grey (10 YR 3/1) clay; medium granular structure; friable consistency; pH – 6.0.

G_1 9 – 18 inches grey (10 YR 5/1) clay; mottled; coarse subangular blocky structure: plastic consistency: pH – 5.8.

G_2 18 – 24 inches light brownish grey (10 YR 6/2) clay; mottled; coarse blocky structure; plastic consistency; pH – 6.2.

C Grey (10 YR 6/1) clay; low lime content; pH – 6.6.

6. **Vasey Loam (Vl).**

The Vasey soils are well drained and occur on an undulating ground moraine. The texture of the soil varies from a loam to a sandy loam. These soils occur in Mara and Rama Townships and also in Simcoe County. A considerable number of stones and boulders occur on the surface.

A virgin profile has the following characteristics:

A_o Thin partially decomposed leaf litter.

A_1 0 – 4 inches very dark grey-brown (10 YR 3/2) loam: fine crumb structure to fine granular structure: very friable consistency: stony: pH – 4.7.

$B_{B,P}$ 4 – 8 inches dark brown (7.5 YR 4/2) loam: coarse crumb structure to coarse granular structure: very friable consistency; few stones; pH – 6.0.

A_{22} 8 – 15 inches dark brown (7.5 YR 4/4) loam: fine subangular blocky structure: friable consistency: few stones: pH – 6.8.

B_2 15 – 27 inches dark brown (7.5 YR 4/4) loam: coarse subangular blocky structure; hard consistency; few stones: pH – 7.0 (This horizon may sometimes be absent).

C Light brownish grey (10 YR 6/2) loam: stony: slightly calcareous; pH – 7.4.

3.2 Vegetation Communities and Floristics

3.2.1 Regional Cover Characteristics

Based on a forest classification system by Rowe (1972), the vegetation cover of Canada was delineated into eight major forest regions or formations, based on the presence and distribution of dominant tree species. These formations are considered to be a reflection of direct responses to broad climatic regimes. Within each of these regions, distinct sections were delineated and mapped according to local patterns in tree composition associated with physiographic and geological features. On this basis, the Atherley/Rama/Uptergrove Secondary Plan Area lies within the Huron-Ontario Section of the Great Lakes St. Lawrence Forest Region.

In the Rowe (1972) classification system, it was noted that forest cover constituting this region consisted of a relatively rich mixture of hardwood and conifer tree species. Natural forested stands on well-drained sites are typically dominated by a variety of hardwoods such as sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*), together with other woody associates such as basswood (*Tilia americana*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*), bur oak (*Quercus macrocarpa*), red ash (*Fraxinus pennsylvanica*) and white ash (*Fraxinus americana*). Eastern hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), white pine (*Pinus strobus*), balsam fir (*Abies balsamea*), blue-beech (*Carpinus caroliniana*), silver maple (*Acer saccharinum*), slippery elm (*Ulmus rubra*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica* var. *subintegerrima*), white elm (*Ulmus americana*), and eastern white cedar (*Thuja occidentalis*) are also relatively common, but generally occur on slightly moist to wet, cooler sites, notably in river valley systems or in low-lying area within and at wetland margins. Black cherry (*Prunus serotina*) and ironwood (*Ostrya virginiana*) are commonly found on upland sites, but are rarely abundant.

Trembling aspen (*Populus tremuloides*), large-toothed aspen (*Populus grandidentata*), and balsam poplar (*Populus balsamifera*) are widespread in young, successional forests, and commonly occur at the ecotones between fields, agricultural cropland and pastureland and more mature phases of forest growth.

Maycock (1979) presented a more detailed, but similar forest cover pattern based on compositional trends in environmental gradients (e.g., site moisture, soils, and microclimate). Apart from the forest cover of this region, he described a wide range of minor plant communities that occupy marginal sites (e.g., too open and dry, or too wet to support forest growth) or secondary successional sites.

Typical examples of such communities are:

- old fields dominated by a wide variety of native, naturalized, and weed species, such as Canada goldenrod (*Solidago canadensis*), New England aster (*Aster novae-angliae*), blue grass (*Poa compressa*) and St. John's-wort (*Hypericum perforatum*);
- dry upland thickets dominated by species such as staghorn sumac (*Rhus typhina*), gray dogwood (*Cornus racemosa*) and common juniper (*Juniperus communis*);
- wet lowland thickets dominated by various willows (*Salix discolor, Salix eriocephala, Salix petiolaris*), speckled alder (*Alnus rugosa*) and red-osier dogwood (*Cornus stolonifera*);
- wet meadow communities dominated by grasses such as reed canary grass (*Phalaris arundinacea*), and Canada blue joint (*Calamagrostis canadensis*) and sedges (*Carex retrorsa, Carex lacustris, Carex stricta*);
- emergent aquatic communities dominated by wide-leaved cattail (*Typha latifolia*), narrow-leaved cattail (*Typha angustifolia*), soft-stem bulrush (*Scirpus validus*) and giant reed (*Phragmites australis*); and
- floating and submergent aquatic plant communities dominated by water lily (*Nymphaea odorata*), yellow pond lily (*Nuphar variegatum*), duckweed (*Lemna minor*), pondweeds (*Potamogeton gramineus, Potamogeton pectinatus, Potamogeton natans*) and Canada waterweed (*Elodea canadensis*).

As in many areas of southern and central Ontario, much of the original forest cover has been cleared for agricultural cropland (cultivation) and urban and rural settlement; consequently, contiguous, extensive

forest tracts are relatively uncommon (Rowe 1972). However, in areas having limited agricultural capability or erosion susceptible soils, many abandoned farmlands have been planted with extensive conifer plantations, or are reverting to natural plant cover and in varying stages of successional development (e.g., wet meadow, old fields, shrub thickets, young pioneer stands, etc.).

3.2.2 Secondary Plan Area Vegetation

The majority of the general vegetation cover within the Study Area consists of large blocks of anthropogenic habitats, in combination with natural environmental features consisting mainly of extensive treed swamps. There are three main large wetland complexes that have been evaluated and mapped as provincially significant, namely the Sucker Creek-Atherley Narrows Wetland Complex, the Mud Lake Wetland Complex and the McPhee Bay Wetland Complex. The anthropogenic habitats having a monoculture plant cover include parcels of agricultural cropland (e.g., soybean, corn, hay, clover), pastureland, fallow field, farmsteads, old field meadow and cultural thicket. Most of the agricultural parcels are separated by thin bands of deciduous and mixed hedgerows. Interspersed throughout the agricultural lands are small isolated woodlands or forested stands classified as deciduous, mixed or coniferous, depending on their inherent tree composition, as well as small conifer plantations. Other natural features include shrub thicket swamp and cattail marsh. Intermittent tributaries, swales and ditches convey surface drainage through the agricultural and wetland habitats to either the eastern shoreline of Lake Couchiching or the northeastern shoreline of Lake Simcoe. The pattern of vegetation cover is consistent with the regional characteristics described in the previous section. Developed land uses have been categorized as scattered rural residential dwellings and subdivisions, shoreline residential, commercial, industrial, institutional, recreational, cemetery, gravel/sand pit, and landfill.

Figure 2 shows the approximate extent and composition of each of the anthropogenic habitats and natural features, and developed land uses within the secondary plan area. The agricultural land uses are labelled according the cash crop planted in 2005, or if the parcels were fallow or used for grazing by cattle or horses (pastureland). For descriptive purposes, the forested and wetland features are labelled using the Ecological Land Classification (ELC) system, where applicable (Lee *et al.* 1998). The characterization of

these natural features is based on a combination of in-situ site inspections and inventories, aerial photograph interpretation, wetland mapping, and FRI maps (MNR 1978). Anthropogenic habitats such as agricultural cropland, pastureland and fallow fields do not have any ELC code equivalents; these were labelled according to the crop and species composition observed in 2005. The developed land uses such as rural residential, shoreline residential, farmstead, commercial, industrial, institutional, recreational, cemetery, gravel/sand pit and landfill are labelled as well.

The majority of the watercourses and surface drainage features consist of intermittent to dry swales, agricultural drains and road-side ditches, with only small reaches of these natural and man-made features containing pooled, slow-flowing or stagnant waters.

Table 1 contains a summary of the ELC code equivalents for the various deciduous forested stands (FOD4-2, FOD5-8, FOD6-1, FOD6-1, FOD6-4, FOD6-5), mixed forested stands (FOM5-2, FOM7-1, FOM7-2), coniferous forested stand (FOC2-2), deciduous treed swamp (FOD7-2, SWD5-1, SWD6-2, SWD7-1), mixed treed swamp (SWM4-1, SWM6-1), shrub thicket swamp (SWT3-2), cattail marsh (MAS3-1), old field meadow (CUM1-1), cultural thicket (CUT1-1), conifer plantations (CUP3-2, CUP3-3, CUP3-8).

All of these features are described following the terminology of the ELC system developed by the MNR, an **Ecological Land Classification for Southern Ontario – First Approximation and Its Application** (Lee *et al.* 1998). In addition to the ELC system, additional characterization of the vegetation communities was accomplished through a review of the **Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario** by Bakowsky (1997). As defined in Lee *et al.* (1998), an Ecosite, "*is a mappable landscape unit defined by a relatively uniform parent material, soil and hydrology, and consequently supports a consistently recurring formation of plant species which develop over time (vegetation chronosequence).*" Within each ecosite landscape unit, there are a variety of vegetation types. A vegetation type, "*is a part of an ecosite, and represents a specific assemblage of species which generally occur in a site with a more uniform parent material, soils and hydrology, and a more specific stage within a chronosequence.*"

Table 1 in conjunction with **Figure 2** and the representative ground photographs that follow **Table 1** provide a descriptive summary and visual context of the typical tableland and wetland natural features, as well as anthropogenic habitats, namely the agricultural cropland, pastureland, farmsteads and developed areas. A master list of the vascular plant species found to-date within secondary plan area is contained in **Appendix A.**

3.3 Wildlife

A list of the fauna observed and/or reported in the Study Area is contained in **Table 2.** The preliminary wildlife data is based on 2005 site visits, supplemented with information from OBBA breeding bird squares 17PK33 and 17PK34 (Birds Ontario 2001-2005). The majority of the Study Area lies within these breeding bird squares, with squares 17PK 23 and 17PK24 impinging on the very western shoreline of Lake Couchiching and Lake Simcoe.

The wildlife species recorded in the June to October 2005 site visits are assumed to be year-round residents and/or summer breeders. Those listed in **Table 2** were reported during the OBBA surveys or directly sighted or evidence of presence noted through tracks, calls, nests, burrows, browse, and scats during 2005 site visits. Not all of those species listed are confirmed breeders in the Study Area, as both breeding bird squares also include lands abutting the Study Area, although these lands contain similar natural habitats such as forested stands, wetlands (treed swamp and cattail marsh), as well as agricultural cropland and pastureland.

Some bird species such as Caspian tern (*Sterna caspia*), loggerhead shrike (*Lanius ludovicianus*), great blue heron (*Ardea herodias*) and herring gull (*Larus argentatus*) were observed in the Study Area or reported in the past. However, they may no longer breed in this area, or may be utilizing some of its features for feeding and/or roosting functions, or were simply flying overhead during the breeding season.

Based on habitat preference and field observations, wildlife species that utilize for various life cycle stages the agricultural cropland (Ag – corn, Ag – hay, AG – soybean, Ag – clover), fallow agricultural land (Ag – fallow), pastureland (Ag – pasture), dry-moist old field meadow (CUM1-1), sumac cultural thicket (CUT1-1), farmsteads, and developed lands include red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), killdeer (*Charadrius vociferus*), bobolink (*Dolichonyx oryzivorus*), eastern kingbird (*Tyrannus tyrannus*), house wren (*Troglodytes aedon*), eastern bluebird (*Sialia sialis*), American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), field sparrow (*Spizella pusilla*), savannah sparrow (*Passerculus sandwichensis*), vesper sparrow (*Pooecetes gramineus*), song sparrow (*Melospiza melodia*), chipping sparrow (*Spizella passerina*) eastern phoebe (*Sayornis phoebe*), yellow warbler (Dendroica petechia), American goldfinch (*Carduelis tristis*), eastern meadowlark (*Sturnella magna*), brown-headed cowbird (*Molothrus ater*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), groundhog (*Marmota monax*), raccoon (*Procyon lotor*), eastern gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), striped skunk (*Mephistis mephistis*), American toad (*Bufo americanus*) and common garter snake (*Thamnophis sirtalis*).

Wildlife species noted or that would utilize the deciduous forested stands (FOD4-2, FOD5-8, FOD6-1, FOD6-4, FOD6-5), mixed forested stands (FOM5-2, FOM7-1, FOM7-2) and coniferous woodlots (FOC2-2) include broad-winged hawk (*Buteo platypterus*), mourning dove (*Zenaida macroura*), red-eyed vireo (*Vireo olivaceus*), rose-breasted grosbeak (*Pheucticus ludovicianus*), great-crested flycatcher (*Myiarchus crinitus*), red-breasted nuthatch (*Sitta canadensis*), yellow-bellied sapsucker (*Sphyrapicus varius*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), pileated woodpecker (*Dryocopus pileatus*), eastern wood-pewee (*Contopus virens*), black and white warbler (*Mniotilta varia*), yellow-rumped warbler (*Dendroica coronata*), blue jay, American robin, northern oriole (*Icterus galbula*), white-tailed deer, raccoon, eastern gray squirrel, red fox (*Vulpes vulpes*), eastern chipmunk, American porcupine *(Erethizon dorsatum*), wood frog (*Rana pipiens*) and gray treefrog (*Hyla versicolor*).

The wetland habitats consist mainly of treed swamp (SWD6-2, SWD5-1, SWD7-1, SWM4-1, SWM6-1), willow shrub thicket swamp (SWT3-2) and cattail marsh (MAS3-1). These provide breeding, feeding and/or roosting cover for various species combinations comprised of green heron (*Butorides striatus*), American bittern (*Botaurus lentiginosus*), wood duck (*Aix sponsa*), mallard (*Anas platyrhynchos*),

Canada goose (*Branta canadensis*), tree swallow (*Tachycineta bicolor*), gray catbird (*Dumetella carolinensis*), least flycatcher (*Empidonax minimus*), common yellowthroat (*Geothlypis trichas*), swamp sparrow (*Melospiza georgiana*), red-winged blackbird (*Agelaius phoeniceus*), beaver (*Castor canadensis*), spring peeper (*Pseudacris crucifer*), northern leopard frog (*Rana pipiens*) and midland painted turtle (*Chrysemys picta*).

The shoreline and open waters of Lake Couchiching and Lake Simcoe provide habitat for common loon (*Gavia immer*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron, Canada goose, mallard, common moorhen (*Gallinula chloropus*), ring-billed gull (*Larus delawarensis*), herring gull (*Larus argentatus*), Caspian tern, common tern (*Sterna hirundo*), black tern (*Chlidonias niger*), belted kingfisher (*Ceryle alcyon*), green frog (*Rana clamitans*), bull frog (*Rana catesbeiana*), snapping turtle (*Chelydra serpentina*) and midland painted turtle.

The homogeneous tree composition of all three types of conifer plantation (CUP3-2, CUP3-3, CUP3-8) provide habitat for chipping sparrow, mourning dove (*Zenaida macroura*), ruffed grouse (*Bonasa umbellus*), black-capped chickadee, pine warbler (*Dendroica pinus*), American robin, blue jay, American crow (*Corvus brachyrhynchos*), red squirrel (*Tamiasciurus hudsonicus*) and white-tailed deer (*Odocoileus virginianus*).

3.4 Wildlife Habitat and Corridors

The tableland forest cover within most of the secondary plan area consists of relatively small, isolated deciduous, mixed and coniferous forested stands. The largest forested stands consist mostly of treed deciduous swamp contained within the Sucker Creek-Atherley Narrows, Mud Lake and McPhee Bay wetlands. Portions of the Mud Lake and McPhee Bay treed swamp wetlands are contiguous off-site to the east and southeast. Any existing or potential terrestrial wildlife corridors would therefore be restricted mainly to the forested swamps, with some minor connections or linkages to adjacent, isolated tableland forested stands. There is a lack of aquatic corridors within the secondary plan area, given the intermittent character of Sucker Creek and other drainage swales, agricultural drains and ditches. Portions of the shorelines of Lake Couchiching and Lake Simcoe contain wetland habitat (i.e., open water marsh, cattail

marsh) in the McPhee Bay and Sucker Creek-Atherley Narrows wetlands: these offer corridor functions for waterfowl and shorebirds.

3.5 Water Quality

It is not the intent herein to describe in detail water quality conditions in Lake Simcoe and Lake Couchiching, as complete evaluations are available in the earlier mentioned citations. As well, the focus of this MSP is on the land and types of servicing that can have beneficial effects on downgradient water quality. Nonetheless, some comments on conditions in the two lakes are warranted.

3.5.1 Lake Simcoe

As reported in **A Discussion Paper – Phosphorus, Lake Simcoe and New Urban Development** (2004), concentrations of total phosphorus have declined, and water clarity has increased based on long term data. As well, there has been a trend to improved deep-water summer dissolved oxygen depletion rates in relation to rates in the 1980s. The gains appear to relate in part to the filtering effect of zebra mussels which were introduced to the Lake Simcoe ecosystem in the early 1990s. No strong signs were evident of worsening water quality that characterized Lake Simcoe and Cook's Bay in the two decades prior to the establishment of zebra mussels. These in-lake findings are consistent with the calculations of Scott *et al.* (2001) and Nicholls (2001) which showed no indications of increases in total loadings of phosphorus to the lake.

3.5.2 Lake Couchiching

In documenting background water quality conditions for Lake Couchiching in the vicinity of the Cumberland Beach area for purposes of evaluating impacts of the new West Shore Sewage Treatment works, Michalski Nielsen Associates Limited (2006) reported the following.

- The mean annual total phosphorus concentration at each of five sampling sites ranged from 0.011 milligrams per litre (mg/L) to 0.017 mg/L, indicating that the lake is moderately enriched.

  In contrast, the most recent Secchi disc values (i.e., which measure water clarity) are greater than 5 metres (m), with actual measurements as high as 5.8 m, suggesting oligotrophic or nutrient-poor conditions. The chlorophyll *a* (i.e., the green pigment in algae that are suspended in the water

column) values are quite low, and generally less than 1.4 micrograms per litre (Φg/L); such values also suggest an oligotrophic lake.

- Based on the above information, Michalski Nielsen Associates Limited (2006) concluded that the part of Lake Couchiching that fronts Cumberland Beach is oligotrophic to borderline mesotrophic (i.e., moderately productive).

- A comparison was made using historical data collected in 1997 and 2003 on the one hand, and 2004 on the other. A potential trend to increasing water clarity with concomitant increases in total phosphorus was apparent, likely reflecting the grazing effects of both zebra and quagga mussels.

- The presence of the quagga mussel is interesting because it is the first recording of this species in Lake Couchiching, although it was confirmed in Lake Simcoe in 2004. Quagga mussels are more generalistic in terms of habitat preference than zebra mussels, and can exploit areas where the latter are limited, including deeper water and salt substrates. As with the zebra mussel, the quagga mussel reproduces rapidly and could compound the effects of zebra mussel introduction and subsequent establishment. More specifically, water quality data collected from Lake Simcoe indicated a dramatic improvement in water clarity (i.e., Secchi disc values) following the introduction of this mussel. The improvements are attributed to the removal of particles suspended in the water column. Based on the Lake Simcoe experience, it can be expected that the presence of zebra and quagga mussels in Lake Couchiching would have a similar impact.

4 RESOURCE EVALUATION

4.1 Vegetation Communities and Floristics

The determination of rarity or significance for the vegetation communities (ELC units) and vascular plant species within the Atherley/Uptergrove Secondary Plan Area and the Rama Road Corridor was determined from standard status lists, published literature and municipal, provincial and federal internet web sites (County of Simcoe 2005, NHIC 2005, Environment Canada 2005). Sources for flora included Bakowsky (1997), Argus and Pryer (1990), Province of Ontario (1990), NHIC (2005), Oldham (1999), MNR (2005), Argus *et al.* (1982-1987) and Reznicek and Bobbette (1979). The determination for plant species rarity consisted of a straightforward comparison of the vascular plant species found in the amendment area during the summer and fall 2005 site visits, with those listed in the source references.

From a federal perspective, a review of Schedule 1 of plants cited in the ***Species At Risk Act*** with those listed in **Appendix A** and other natural area technical reports, no extirpated, endangered or threatened vascular plant species were noted for the Study Area.

Based on a provincial perspective, large blocks of the secondary plan Study Area contain all or parts of three provincially significant wetlands: as evaluated and mapped by the MNR. These include the Sucker Creek-Atherley Narrows Wetland Complex (Gillespie and Simkin 1984, Simkin and Gillespie 1984, and Medd 1995), the Mud Lake Wetland Complex (Black, Simkin and Purves 1984), and the McPhee Bay Wetland Complex (Black, Simkin, Gillespie and Ferguson 1984). There are also a number of wetland habitats within the Study Area that have not been evaluated and are therefore assumed to be of local significance, with their locations and extent shown on **Figure 2**.

Based on a review of the County of Simcoe Official Plan, some of the large blocks of natural vegetation cover or vegetation features lie within part of the County of Simcoe Greenland, as shown on Schedule 5.1 – Land Use Designations (County of Simcoe 1998). Most of the Greenland features lie within all or parts of the evaluated wetlands, namely the provincially significant Sucker Creek-Atherley Narrows, McPhee Bay Wetland and Mud Lake Wetland Complexes. Parts of these complexes are contiguous outside of the study area, with the majority of the Mud Lake Wetland drainage flowing northward to Mud Lake. The Sucker Creek-Atherley Narrows Wetland drainage is contained in the Lake Couchiching subwatershed boundary. Part of the McPhee Bay Wetland drainage is towards the Lake Simcoe subwatershed boundary, to the south of Highway 7-12. There are no life science or earth science Areas of Natural or Scientific Interest (ANSIs) based on a review of Schedule 5.2.3. Schedule 5.4 – Natural Heritage System shows these same features and wetlands as lying within parts of Natural Heritage Unit CP1 (Atheley Narrows) and parts of Natural Heritage Unit CP2 (Lake St. John/Mud Lake Corridor).

Attributes and functions identified in the CP1 – Atherley Narrows natural heritage unit include aquatic habitat, terrestrial habitat, warmwater fish habitat, fish spawning, waterfowl concentration and the presence of the provincially significant Sucker Creek-Atherley Narrows Wetland Complex (Gartner Lee Limited 1996). Attributes and functions listed in the same report for the CP2 – Lake St. John/Mud Lake Corridor include discharge (water storage function), flood storage, conveyance, water quality enhancement, aquatic and terrestrial habitat, warmwater fish habitat, fish spawning, habitat for provincially rare flora and fauna and uncommon vegetation, north-south corridor providing important wildlife habitat linkage between the Precambrian Shield and the northeastern shore of Lake Simcoe. The heritage unit also contains three provincially significant wetlands, parts of which lie within the Study Area: Mud Lake Wetland, Sucker Creek-Atherley Narrows Wetland, and the McPhee Bay Wetland.

Schedule A – Land Use Plan in the Town of Ramara Official Plan shows location and extent of areas designated as Natural Area Protection (Township of Ramara 2003). The majority of the Natural Area Protection units coincide with those portions of the provincially significant wetlands that are germaine to the Study Area. Also contained within these areas are the intermittent surface water courses, drainage swales and ditches that convey flows to either Lake Couchiching or Lake Simcoe.

A review of the NHIC web site identified significant natural areas within the proposed secondary plan area (NHIC 2005) including: Atherley Wetlands (AREA_ID:10475); Sucker Creek Wetland (AREA_ID: 9003); McPhee Bay Wetland (AREA_ID: 7902); Mud Lake Wetland (AREA_ID:7901). As noted above, all are evaluated and designated as provincially significant wetlands. Mara Provincial Park (AREA_ID: 3132) is listed mainly for its recreational values; however, it also contains stands of deciduous treed swamp (unevaluated wetland).

The vascular plant species compiled from the 2005 site inventories are listed in **Appendix A**. A comparison of these species with the status references listed above, indicate that none is considered rare or significant on either a national, provincial or regional level. All of the plant species encountered are typical of the habitat types common to this physiographic region of Ontario. A review of the background data indicate the presence of a provincially rare cattail sedge (*Carex typhina*) in the Mud Lake Wetland. This sedge is contained in the NHIC database (EO_ID: 67515) and also in a document entitled **Biological Inventory of the Mud Lake Wetland Complex** (Bowles and Sober Environmental Consultants 1991). Robin's spikerush (*Eleocharis robbinsii*) and a pondweed (*Potamogeton strictiflorus*) are listed as regionally rare.

4.2 Wildlife, Wildlife Habitat and Corridors

Standard lists and published literature used to determine the status of fauna included Environment Canada (2005), Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2004), Province of Ontario (1990), NHIC (2005), Birds Ontario (2001-2004), MNR (2005), Ecologistics Limited (1982), Cadman *et al.* (1987), Austen *et al.* (1994) and Dobbyn (1994).

A comparison of wildlife species listed in **Table 2** with the status references, indicate with some minor exceptions that most are considered common and ubiquitous to the Study Area. All species encountered are typical for the habitats and conditions encountered. Species identified during the 2005 site inventories, as well as those listed in OBBA breeding bird squares 17PK3 and 17PK34, NHIC data, provincially significant wetland evaluations and other technical reports indicate the presence of some rarities within or abutting the secondary plan area. Wildlife species, namely birds, that have been designated with some level of rarity are described below.

- **Loggerhead shrike (*Lanius ludovicianus*).** Identified through the NHIC web database as Element Occurrence record (EO_ID:12451) in the Mud Lake Wetland area, based on a July 1, 1974 record. The site square (1 kilometre [km] x 1 km area) impinges on the easterly portion of the Mud Lake Wetland, just at the eastern edge of the Study Area. Another record (EO_ID:12548) dated June 15, 1960 overlaps onto the Mara Provincial Park and surrounding lands. This species is listed on Schedule 1 of the federal ***Species At Risk Act*** as endangered. It is also listed as endangered in the ***Endangered Species Act*** (Province of Ontario 2000) and on the

Species at Risk in Ontario List (MNR 2005). This species was not found during the 2005 site inventories.

- **Black tern (*Chlidonias niger*)**. Identified in the NHIC web database as Element Occurrence record (EO_ID:12029), with the 1 square kilometre (km^2) area overlapping onto the Atherley Wetland. Its evaluation (Simkin and Gillespie 1984) also indicates the presence of this species. It is also listed as a provincially significant bird species based on the Ontario Wetland Evaluation System – Southern Manual (MNR 1993). As well, it is listed in the "Not At Risk Category" – by COSEWIC (2004), but is considered a "Special Concern Species" in Ontario through the Species At Risk program (MNR 2005).

- **Least bittern (*Ixobrychus exilis*)**. The element record for this species (EO_ID:84) overlaps onto the Lake St. John Wetland and impinges slightly onto the Study Area at its very northern edge (south edge of Lake St. John wetland). This marshland bird species is listed as threatened by COSEWIC (2004) and MNR (2005).

- **Caspian tern (*Sterna caspia*)**. This tern species is listed as occurring within the Mud Lake Wetland (Black Simkin and Purves 1984, Bowles and Sober Environmental Consultants 1991), and in the McPhee Bay Wetland (Black Simkin Gillespie Ferguson 1984). It is listed as a provincially significant bird species based on the Ontario Wetland Evaluation System – Southern Manual (MNR 1993). COSEWIC (2004) and MNR (2005) list it in the "Not At Risk Category", and as a "Not At Risk Species" respectively.

- **Common tern (*Sterna hirundo*)**. This shorebird is listed in both the Mud Lake and Atherley wetlands (Black Simkin and Purves 1984, Bowles and Sober Environmental Consultants 1991, and Simkin and Gillespie 1984). It is also listed as a provincially significant bird species based on the Ontario Wetland Evaluation System –Southern Manual (MNR 1993). COSEWIC (2004) and MNR (2005) listed it in the "Not At Risk Category", and as a "Not At Risk Species" respectively.

- **Marsh wren (*Cistothorus palustris*)**. This sedge-cattail marsh bird is listed as occurring in the Mud Lake Wetland (Black Simkin and Purves 1984, Bowles and Sober Environmental Consultants 1991). At the time of the evaluation in 1984, this species was considered provincially significant under the 2nd edition of the Ontario Wetland Evaluation System; but, it has been down-graded and is not listed in the 3rd edition (MNR 1993). It is not listed in either COSEWIC (2004) or MNR (2005).
- **Pied-billed grebe (*Podilymbus podiceps*)**. This bird species prefers open water and cattail/sedge marshes. It has been reported in the Atherley Wetland (Simkin and Gillespie 1984). At the time of the evaluation in 1984, this species was considered provincially significant under the 2nd edition of the Ontario Wetland Evaluation System; however, it has been down-graded and not listed in the 3rd edition (MNR 1993). It is not listed in either COSEWIC (2004) or MNR (2005).

5 SERVICING OPTIONS – PHOSPHORUS LOADINGS

5.1 Introduction

Michalski Nielsen Associates Limited's experience in infrastructure development and lake/stream management indicates that implementing best management practices under the framework of a TPM program is a feasible and desirable way to achieve objectives for both development and sustainable water quality in downstream surface waters. In this regard, conversion of agricultural lands to urban uses near surface waters can have a net beneficial effect on water quality, if responsibly undertaken and managed in the long term, particularly with respect to stormwater runoff. In today's environment, such an approach is not precedent or revolutionary. The only innovation required is linking the various measures together in an integrated program. The Lake Simcoe Region Conservation Authority (LSRCA) has recognized the need for such an approach since at least 2001 (Nicholls 2001).

In servicing the Study Area, it was determined that there were four distinct areas for which sewage and water servicing could be provided, as follows:

- Atherly/Uptergrove
- Rama Road
- North Rama Road
- Longford Mills

Also, there were three servicing options, which are summarized as follows.

1. *Individual Private Servicing*

   - Each property owner (residential lot or commercial development) is responsible for his/her own private subsurface sewage disposal system and individual water supply from a drilled well.
   - For residential development, this type of servicing is only feasible at a density of approximately 2 units/hectare (ha); as well, it must comply with policies of the Ministry of the Environment (MOE).
   - The land uses to be serviced would have the following areas.

–	Residential	667 ha	
–	Village Commercial	38 ha	
–	Institutional Commercial	43 ha	
–	Destination Commercial	304 ha	
		Total	1,062 ha

2. *Commercial Servicing*

   - Groups of multiple property owners using a centralized sewage treatment facility and subsurface disposal area. A communal well or surface water intake and treatment system would be used for water supply.
   - This type of servicing would allow residential development at a density of approximately 9 units/ha.

- The MOE requires municipal ownership and operation if the facilities serve multiple lots under separate ownership. The systems must be large enough to ensure efficient and cost effective operation (i.e.. 200 lots ∀ or equivalent).
- The land uses to be serviced would have the following areas.

–	Residential	355 ha
–	Village Commercial	38 ha
–	Institutional Commercial	43 ha
–	Destination Commercial 304 ha	
	Total	720 ha

3. *Full Municipal Services*

- This option includes centralized large scale sewage treatment. effluent disposal and water supply systems for each major development area. with surface water being used for both domestic supply and disposal of treated sewage. The servicing would be established by:

  - extending existing infrastructure (i.e., the City of Orillia or Mnjikaning First Nation);
  - purchasing and upgrading private systems (i.e., Fern Resort and/or Geneva Park): and
  - constructing new facilities.

- Constructing new facilities is considered the most viable approach for full municipal servicing considering the following:

- the City of Orillia facilities would require significant infrastructure upgrading and plant expansion:
- Mnjikaning First Nation has not expressed an interest in accepting sewage flows or supplying water to development in the Township: and
- purchasing and upgrading private systems that are designed for site specific needs and expanding same is typically a costly option.

- The servicing option allows for residential development at a density of up to 12 units/ha.
- The land uses to be serviced would have the following areas.

–	Residential		176 ha
–	Village Commercial		38 ha
–	Institutional Commercial		43 ha
–	Destination Commercial	304 ha	
	Total		561 ha

For the Atherley/Uptergrove and Longford Mills areas, stormwater would be treated by centralized management systems. In contrast, the Rama Road and Rama Road North areas would be dealt with on a site specific development application basis: this is because the watershed characteristics in these areas are highly variable. having multiple road crossings, no distinct outlets. and difficult topography. All facilities would be designed to control flows from a 100-year storm event to pre-development levels. and to achieve an "enhanced" level of water quality effluent.

In the following sections, analyses are undertaken to show how phosphorus loading in a built- out setting will be less than they are at present.

5.2 Approach – Export Coefficient Modeling

An export coefficient modeling approach was used to estimate the existing annual loads of phosphorus that are within the proposed development areas. This is a well-established method of determining the amount of phosphorus exported for a specific site (Redshaw *et al.* 1980, Hough Stansbury + Michalski Limited 1983, and Rast and Lee 1983), and has been used recently to determine phosphorus loadings to agricultural and urban watersheds in southern Ontario and Lake Simcoe more specifically (Winter and Duthie 2000, and Winter *et al.* 2003). The approach is similar to that successfully applied by Gartner Lee Limited for the proposed Big Bay Point Resort Development, which fronts on the shoreline of Lake Simcoe in the Town of Innisfil (Gartner Lee Limited 2004), and more recently by Stantec Consulting Limited *et al.* (2005) to the Bradford Bond Head Planning Area, and by Michalski Nielsen Associates Limited (2005) to the Watersands project in the Town of Innisfil.

Direction on the use of phosphorus export coefficients for estimating annual loads is based on information on yields from different land use types to downstream water bodies. Knowing the area of land in a watershed devoted to specific uses and the quantities of nutrients exported per unit area of these uses, the total annual loads of phosphorus can subsequently be estimated.

A simple phosphorus export model was prepared for the four areas. The loads were predicted as the sum of the export of phosphorus from each type of land use within the subject lands. The model equation is as follows.

$$L = E\ EiAi$$

where,

- L is the annual phosphorus loading delivered to either of Lake Simcoe or Lake Couchiching;
- Ai is the area of land uses; and
- Ei is the export coefficient selected for the specific land uses. The export coefficients were expressed as kilograms/hectare/year (kg/ha/yr), and were derived from the detailed analyses recently undertaken for the above-noted development proposal in the Bradford/Bond Head area.

5.3 Selection of Phosphorus Export Coefficient

As indicated above, a detailed rationale for relating phosphorus export coefficients was recently undertaken for the Bradford Bond Head Planning Area in West Gwillimbury and for a large block of land subtending Highway 400 in the Town of Innisfil (i.e., the Watersands project). It involved the ranking of information on soil types (i.e., ranked from those having the lowest potential for exporting phosphorus to those having the highest), slopes, and land use characteristics. For agricultural uses, the scores produced by the ranking were then allocated a phosphorus export coefficient based on the range of known cropland coefficients for southern Ontario. For example, the maximum possible score of 14 was assigned to a phosphorus export of 1.5 kg/ha/yr, which is slightly below the maximum cropland coefficient of 1.65 kg/ha/yr for the Thames River basin, and slightly above that derived for Hillman Creek (1.43 kg/ha/yr).

The lowest applicable phosphorus export value in the literatire. 0.05 kg/ha/yr was assigned to the lowest score that was tabulated for the study area. Intermediate scores of 9 – 11, representing phosphorus export coefficients of 0.55 kg/ha/yr to 0.85 kg/ha/yr corresponded to the range of cropland coefficients derived for the Ausable River basin (0.56 kg/ha/yr). Big Creek (0.65 kg/ha/yr). Grand River (0.78 kg/ha/yr). and middle Thames River (0.81 kg/ha/yr).

Appendix B is a summary of phosphorus export values for landscapes in the south central part of Ontario, while **Table 3** presents export coefficients that were applied to lands within the Study Area.

Since non-agricultural landscapes experience lower variability in phosphorus export with slope and soil type. single coefficients were assigned to all other land uses. as follows.

- Forested areas and regenerating old fields were allocated a phosphorus export coefficient of 0.10 kg/ha/yr. which represents the approximate mean of the known range of values for southern Ontario.

- Open space, recreational and institutional lands were assigned a value of 0.30 kg/ha/yr since these areas are likely to experience active management in the form of fertilizer application. as well as a greater degree of runoff than forested areas owing to the presence of trails. roads and recreational facilities.

- For rural, non-farm residences. a phosphorus export coefficient of 0.5 kg/ha/yr was used. This value was derived by Winter and Duthie (2000) to reflect low-density and mid-density residential development.
- Since employment lands possess a greater percentage of impervious surfaces such as rooftops and parking areas, as well as a lower percentage of managed areas. a phosphorus export coefficient of 1.0 kg/ha/yr was selected.

- Paved surfaces including airports were allocated a phosphorus export coefficient of 0.5 kg/ha/yr, indicating that roads are not managed features.

- An export coefficient for wetlands was taken from Gartner Lee Limited (2004) – 0.16 kg/ha/yr. This value was derived for Big Bay Point, using information from the East Holland River Subwatershed Management Plan (Lake Simcoe Region Conservation Authority 2001).

5.4 Existing Phosphorus Budget

Tables 4. through **7** present the results of applying the phosphorus export modeling to the Atherley. Uptergrove. Longford Mills, North Rama Road and Rama Road areas respectively. The shoreline residential component was determined by counting developed shoreline and backshore (i.e., on the upgradient side of the road) residences and assuming three persons per unit. a phosphorus contribution of 0.8 kilograms per capita (Ministry of the Environment 1986). and a soil retention coefficient of 0.5 (Scott *et al.* 2001). Sewage treatment plant loadings were determined as the product of annual discharges (cubic metres/year) and phosphorus concentrations of 0.5 mg/L and 0.15 mg/L. For all development in Options 1 and 2 (which will be well back or removed from the shorelines of Lake Simcoe and Lake Couchiching), phosphorus reductions of 99 % were assumed for subsurface sewage treatment systems. In this regard. Michalski Nielsen Associates Limited has been testing the use of specific soils to retain domestic sewage

related phosphorus at a property on South Kushog Lake in Haliburton County. Monitoring has been underway for four years on two features: first, concentrations of phosphorus in the sewage before entering a septic tank tile field, and treated (i.e., following filtration through the imported soil); and second, phosphorus retention capability of soils. All of the fill used in constructing the tile field was imported orangy, brown "B" horizon Precambrian Shield sandy soils: such soils have high concentrations of aluminum and iron which are important in phosphorus mineralization reactions. Very significant reductions (i.e., >99%) in phosphorus concentrations have been consistently measured when values in the treated sewage (i.e., 0.007 mg/L to 0.038 mg/L) are compared with those in the septic tank or distribution box (i.e., 9.13 mg/L). As well, the phosphorus retention capacity of the soils has not been depleted to any great extent; estimates of available phosphorus uptake after four years of monitoring are within the same order of magnitude as when the tile field was installed.
Using **Table 4** as an example, the existing annual load to Lake Simcoe was estimated to be 528 kilograms/year (kg/yr) for the Atherley/Uptergrove area. In a worst case post-development scenario 760 kg/yr will be added to the lake, representing an increase of 452 kg/year over existing loadings. However, all stormwater runoff from the developed lands will be directed to stormwater management facilities that will be designed to achieve Level 1 treatment. As explained by Gartner Lee Limited (2004), ". . . Level 1 stormwater treatment will remove 80% of the total suspended solids from stormwater runoff. Urban runoff also contains phosphorus; however, and most of it is in particulate form, adsorbed to solids in runoff. Approximately, 70% of the phosphorus urban runoff in found associated with solids, and so, removal of solids by Level 1 stormwater treatment will also remove much of the phosphorus (**Figure 3**). Recent discussions with the Lake Simcoe Region Conservation Authority confirmed that 70% was a reasonable estimate of the load of phosphorus removal that could be achieved by Level 1 treatment of urban runoff at the Big Bay Point Resort Development."

The results clearly show that loadings of phosphorus associated with Options 1 and 2 are lower than Option 3, either with 0.3 mg/L or 0.15 mg/L in treated sewage. This is because the two levels of phosphorus removed (i.e., 0.3 mg/L and 0.15 mg/L), even though very high, are not high enough to compensate for the highest level of phosphorus reduction that can technically be achieved from stormwater runoff. As well, there is every reason to believe that virtually near-zero phosphorus impacts can be achieved with subsurface disposal that is well back from the lakes' shorelines and are constructed using soils that have a high capability to retain phosphorus (see above). There are only two ways that sewage related phosphorus in Option 3 can be reduced below the existing annual load estimate of 355 kg/year. One is to further reduce effluent concentrations to much less than 0.10 mg/L: the other is to tie in existing shoreline development to the municipal treatment system; as noted earlier, these are all on septic tank tile fields or filter beds. As well, some combination of the two approaches would work. However, both approaches would be expensive.

Accordingly, for the Atherley/Uptergrove example, Option 2 provides the lowest post-development annual phosphorus loading (i.e., 367 kg/year, in comparison to 432 kg/yr for Option 1 and 714 kg/yr to 513 kg/yr for Option 3, depending on concentration of total phosphorus in the treated sewage effluent).

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SUMMARY AND CONCLUSIONS

1. This environmental component of the Master Servicing Plan for the Atherley/Uptergrove Secondary Plan Area/Rama Road Corridor:

   - identified the extent and character of the Study Area's biological and physical resources;
   - determined the significance of the identified natural heritage features; and
   - evaluated various servicing options to mitigate potential detrimental effects on such resources, and particularly surface water quality of Lake Simcoe and Lake Couchiching.

2. The following are highlights of the resource identification/evaluation.

   - From the perspective of federal legislation, no extirpated, endangered or threatened plants were recorded.

   - All or parts of three Provincially Significant Wetlands occur in the Study Area: Sucker Creek-Atherly Narrows Wetland Complex; Mud Lake Wetland Complex; and McPhee Bay Wetland Complex.

   - A number of other wetlands not evaluated by the Ministry of Natural Resources have local significance.

   - The County of Simcoe's Greenland designation includes some large blocks of natural vegetation cover, most within the Provincially Significant Wetlands.

   - Some individual rare plants were found (i.e., a cattail ridge, Robin's spikerush, and a pondweed), but these are protected within the Provincially Significant Wetlands.

   - Most wildlife are considered common and ubiquitous to the Study Area.

   - There are a number of bird species that have some level of rarity including:

- loggerhead shrike
- black tern
- least bittern
- Caspian tern
- common tern
- marsh wren
- pied-billed grebe

- Water quality in both nearshore Lake Simcoe and Lake Couchiching are good to excellent in terms of trophic state conditions (i.e., low amounts of phosphorus, algae, and high water clarity).

- Quagga mussels were first recorded in Lake Couchiching in 2004, in the waters fronting Cumberland Beach. These will likely have similar impacts on water clarity in the years ahead as zebra mussels have had in the past.

3. A phosphorus export coefficient model was constructed to predict changes in loadings to downgradient surface waters for three development scenarios: individual private services; communal subsurface servicing; and full municipal services. Of the three, communal subsurface servicing would deliver the lowest annual load of phosphorus to downgradient Lake Simcoe and Lake Couchiching; as well, the loads in full build-out would be lower than at present, thereby providing public benefits insofar as water quality improvements are concerned.

APPENDIX A) VASCULAR PLANT LIST

Working list of vascular plant species found in the Atherley/Rama Secondary Plan Area based on field work conducted from June to October, 2005 by Michalski Nielsen Associates Limited. A + preceding a name indicates a non-native or adventive species.

STATUS	SCIENTIFIC NAME	COMMON NAME
	LYCOPODIACEAE	CLUB-MOSS FAMILY
	Dipasiastrum digitatum	crowfoot club-moss
	Huperzia lucidula	shining club-moss
	Lycopodium dendroideum	round-branched ground-pine
	EQUISETACEAE	HORSETAIL FAMILY
	Equisetum arvense	field horsetail
	Equisetum fluviatile	water horsetail
	Equisetum hyemale	scouring-rush
	Equisetum pratense	meadow horsetail
	OSMUNDACEAE	ROYAL FERN FAMILY
	Osmunda claytoniana	interrupted fern
	Osmunda regalis	royal fern
	DENNSTAEDTIACEAE	BRACKEN FAMILY
	Pteridium aquilinum	eastern bracken fern
	THELYPTERIDACEAE	MARSH FERN FAMILY
	Thelypteris palustris	marsh fern
	DRYOPTERIDACEAE	WOOD-FERN FAMILY
	Athyrium filix-femina	lady fern
	Cystopteris bulbifera	bulblet fern
	Cystopteris tenuis	fragile fern
	Dryopteris carthusiana	spinulose wood-fern
	Dryopteris intermedia	evergreen wood-fern
	Dryopteris marginalis	marginal wood-fern
	Gymnocarpium dryopteris	oak fern
	Matteuccia struthiopteris	ostrich fern
	Onoclea sensibilis	sensitive fern
	PINACEAE	PINE FAMILY
	Abies balsamea	balsam fir
	Larix laricina	tamarack
+	*Picea abies*	Norway spruce
	Picea glauca	white spruce

STATUS	SCIENTIFIC NAME	COMMON NAME
	Picea pungens	blue Colorado spruce
+	*Picea nigra*	Austrian pine
	Pinus resinosa	red pine
	Pinus strobus	white pine
+	*Pinus sylvestris*	Scotch pine
	Tsuga canadensis	eastern hemlock
	CUPRESSACEAE	**CEDAR FAMILY**
	Thuja occidentalis	eastern white cedar
	TAXACEAE	**YEW FAMILY**
	Taxus canadensis	American yew
	ARISTOLOCHIACEAE	**DUTCHMAN'S-PIPE FAMILY**
	Asarum canadense	wild ginger
	NYMPHAEACEAE	**WATER-LILY FAMILY**
	Nuphar variegatum	bullhead pond-lily
	Nymphaea odorata	fragrant pond-lily
	CERATOPHYLLACEAE	**HORNWORT FAMILY**
	Ceratophyllum demersum	common coontail
	RANUNCULACEAE	**BUTTERCUP FAMILY**
	Actaea pachypoda	white baneberry
	Actaea rubra	red baneberry
	Anemone acutiloba	sharp-lobed hepatica
	Anemone canadensis	Canada anemone
	Anemone virginiana	thimbleweed
	Aquilegia canadensis	wild columbine
	Clematis virginiana	Virgin's-bower
	Coptis trifolia	goldthread
	Ranunculus abortivus	kidney-leaved buttercup
+	*Ranunculus acris*	common buttercup
+	*Ranunculus repens*	creeping buttercup
	Ranunculus sceleratus	cursed crowfoot
	Thalictrum dioicum	early meadow-rue
	Thalictrum pubescens	tall meadow rue
	BERBERIDACEAE	**BARBERRY FAMILY**
	Caulophyllum thalictroides	blue cohosh
	Podophyllum peltatum	may-apple

STATUS	SCIENTIFIC NAME	COMMON NAME
	PAPAVERACEAE	POPPY FAMILY
	Sanguinaria canadensis	bloodroot
	FUMARIACEAE	FUMITORY FAMILY
	Dicentra canadensis	squirrel-corn
	ULMACEAE	ELM FAMILY
	Ulmus americana	white elm
+	*Ulmus pumila*	Siberian elm
	Ulmus rubra	red elm
	URTICACEAE	NETTLE FAMILY
	Laportea canadensis	wood nettle
	Pilea pumila	dwarf clearweed
+	*Urtica dioica*	stinging nettle
	JUGLANDACEAE	WALNUT FAMILY
	Carya cordiformis	bitternut hickory
	Juglans nigra	black walnut
	FAGACEAE	BEECH FAMILY
	Fagus grandifolia	American beech
	Quercus alba	white oak
	Quercus macrocarpa	bur oak
	Quercus rubra	red oak
	BETULACEAE	BIRCH FAMILY
	Betula papyrifera	white birch
+	*Betula pendula*	European weeping birch
	Carpinus caroliniana	blue beech
	Corylus cornuta	beaked hazel
	Ostrya virginiana	ironwood
	CHENOPODIACEAE	GOOSEFOOT FAMILY
+	*Chenopodium album*	lamb's-quarters
+	*Chenopodium glaucum*	oak-leaved goosefoot
	AMARANTHACEAE	AMARANTH FAMILY
+	*Amaranthus powellii*	green pigweed
	CARYOPHYLLACEAE	PINK FAMILY
+	*Cerastium arvense*	field chickweed
+	*Cerastium fontanum*	mouse-eared chickweed
+	*Saponaria officinalis*	bouncing-bet

STATUS	SCIENTIFIC NAME	COMMON NAME
+	*Silene latifolia*	bladder campion
+	*Silene noctiflora*	night-flowering catchfly
+	*Stellaria media*	common chickweed
	POLYGONACEAE	**BUCKWHEAT FAMILY**
+	*Fagopyrum esculentum*	buckwheat
	Polygonum aviculare	prostrate knotweed
(+)	*Polygonum hydropiper*	water-pepper
+	*Polygonum persicaria*	lady's thumb
+	*Rumex acetosella*	field sorrel
+	*Rumex crispus*	curled dock
+	*Rumex obtusifolius*	bitter dock
	Rumex orbiculatus	great water dock
	GUTTIFERAE	**ST. JOHN'S-WORT FAMILY**
+	*Hypericum perforatum*	common St. John's-wort
	Triadenum fraseri	marsh St. John's-wort
	TILIACEAE	**LINDEN FAMILY**
	Tilia americana	basswood
+	*Tilia cordata*	linden
	MALVACEAE	**MALLOW FAMILY**
+	*Malva neglecta*	common mallow
	VIOLACEAE	**VIOLET FAMILY**
	Viola conspera	dog violet
	Viola cucullata	marsh blue violet
	Viola pubescens	downy yellow violet
	Viola sororia	woolly blue violet
	CUCURBITACEAE	**GOURD FAMILY**
	Echinocystis lobata	wild cucumber
	SALICACEAE	**WILLOW FAMILY**
+	*Populus alba*	white poplar
	Populus balsamifera	balsam poplar
	Populus grandidentata	large-toothed aspen
	Populus tremuloides	trembling aspen
+	*Salix alba*	white willow
	Salix bebbiana	Bebb's willow

STATUS	SCIENTIFIC NAME	COMMON NAME
	Salix discolor	pussy willow
	Salix eriocephala	Missouri willow
+	*Salix fragilis*	crack willow
	Salix petiolaris	slender willow
+	*Salix purpurea*	basket willow
	BRASSICACEAE	MUSTARD FAMILY
+	*Alliaria petiolata*	garlic mustard
–	*Barbarea vulgaris*	winter cress
+	*Brassica nigra*	black mustard
	Cardamine diphylla	toothwort
–	*Erysimum cheiranthoides*	wormseed mustard
+	*Hesperis matronalis*	dame's-rocket
+	*Lepidium campestre*	field cress
+	*Lepidium densiflorum*	common pepper-grass
–	*Thlaspi arvense*	field penny cress
	PYROLACEAE	WINTERGREEN FAMILY
	Pyrola elliptica	shinleaf
	PRIMULACEAE	PRIMROSE FAMILY
	Lysimachia ciliata	fringed loosestrife
	Lysimachia nummularia	moneywort
	Trientalis borealis	starflower
	GROSSULARIACEAE	GOOSEBERRY FAMILY
	Ribes americanum	wild black currant
	Ribes cynosbati	prickly gooseberry
–	*Ribes rubrum*	red currant
	SAXIFRAGACEAE	SAXIFRAGE FAMILY
	Tiarella cordifolia	foam flower
	ROSACEAE	ROSE FAMILY
	Agrimonia gryposepala	tall hairy agrimony
	Crataegus spp.	hawthorn
	Fragaria vesca	woodland strawberry
	Fragaria virginiana	common strawberry

STATUS	SCIENTIFIC NAME	COMMON NAME
	Geum aleppicum	yellow avens
	Geum canadense	white avens
+	*Potentilla recta*	rough-fruited cinquefoil
+	*Malus pumila*	common crabapple
	Prunus serotina	black cherry
	Prunus virginiana	choke cherry
+	*Rosa multiflora*	multiflora rose
	Rubus occidentalis	black raspberry
+	*Rubus strigosus*	red raspberry
+	*Sorbus aucuparia*	European mountain-ash
	Spiraea alba	narrow-leaved meadow-sweet
	FABACEAE	**PEA FAMILY**
+	*Lotus corniculatus*	bird's-foot trefoil
+	*Medicago lupulina*	black medick
–	*Medicago sativa*	alfalfa
+	*Melilotus alba*	white sweet-clover
+	*Melilotus officinalis*	yellow sweet-clover
+	*Trifolium aureum*	hop clover
+	*Trifolium pratense*	red clover
+	*Trifolium repens*	white clover
+	*Vicia cracca*	cow vetch
–	*Vicia tetrasperma*	slender vetch
	HALORAGACEAE	**WATER-MILFOIL FAMILY**
+	*Myriophyllum spicatum*	Eurasian water-milfoil
	LYTHRACEAE	**LOOSESTRIFE FAMILY**
+	*Lythrum salicaria*	purple loosestrife
	ONAGRACEAE	**EVENING-PRIMROSE FAMILY**
	Circaea lutetiana	enchanters nightshade
+	*Epilobium hirsutum*	great hairy willow-herb
+	*Epilobium parviflorum*	sparse-flowered willow-herb
–	*Oenothera parviflora*	small-flowered evening-primrose
	CORNACEAE	**DOGWOOD FAMILY**
	Cornus alternifolia	alternate-leaved dogwood
	Cornus rugosa	round-leaved dogwood

STATUS	SCIENTIFIC NAME	COMMON NAME
	Cornus stolonifera	red-osier dogwood
	RHAMNACEAE	BUCKTHORN FAMILY
+	*Rhamnus cathartica*	common buckthorn
+	*Rhamnus frangula*	glossy buckthorn
	VITACEAE	GRAPE FAMILY
	Parthenocissus inserta	Virginia creeper
	Vitis riparia	riverbank grape
	ACERACEAE	MAPLE FAMILY
(+)	*Acer negundo*	Manitoba maple
	Acer rubrum	red maple
	Acer saccharinum	silver maple
	Acer saccharum	sugar maple
	ANACARDIACEAE	CASHEW FAMILY
	Rhus radicans	climbing poison-ivy
	Rhus typhina	staghorn sumac
	OXALIDACEAE	WOOD SORREL FAMILY
+	*Oxalis stricta*	European wood sorrel
	GERANIACEAE	GERANIUM FAMILY
	Geranium robertianum	herb-robert
	BALSAMINACEAE	TOUCH-ME-NOT FAMILY
	Impatiens capensis	spotted jewelweed
	ARALIACEAE	GINSENG FAMILY
	Aralia nudicaulis	wild sarsaparilla
	Cicuta bulbifera	bulb-bearing water hemlock
0	*Daucus carota*	wild carrot
+	*Pastinaca sativa*	wild parsnip
	Sium sauve	water parsnip
	APOCYNACEAE	DOGBANE FAMILY
	Apocynum androsaemifolium	spreading dogbane
	ASCLEPIADACEAE	MILKWEED FAMILY
	Asclepias incarnata	swamp milkweed
	Asclepias syriaca	common milkweed

STATUS	SCIENTIFIC NAME	COMMON NAME
	SOLANACEAE	**NIGHTSHADE FAMILY**
+	*Solanum dulcamara*	deadly nightshade
	CONVOLVULACEAE	**MORNING-GLORY FAMILY**
+	*Convolvulus arvensis*	field bindweed
	HYDROPHYLLACEAE	**WATER-LEAF FAMILY**
	Hydrophyllum virginianum	Virginia waterleaf
	BORAGINACEAE	**BORAGE FAMILY**
+	*Cynoglossum officinale*	hound's-tongue
+	*Echium vulgare*	viper's bugloss
+	*Lithospermum officinale*	common gromwell
+	*Myosotis scorpioides*	true forget-me-not
	VERBENACEAE	**VERVAIN FAMILY**
	Verbena hastata	blue vervain
	Verbena urticifolia	white vervain
	LAMIACEAE	**MINT FAMILY**
	Clinopodium vulgare	wild basil
+	*Glechoma hederacea*	ground ivy
	Lycopus americanus	water horehound
	Mentha arvensis	wild mint
+	*Nepeta cataria*	catnip
+	*Prunella vulgaris*	heal-all
	PLANTAGINACEAE	**PLANTAIN FAMILY**
+	*Plantago lanceolata*	narrow-leaved plantain
+	*Plantago major*	common plantain
	OLEACEAE	**OLIVE FAMILY**
	Fraxinus americana	white ash
	Fraxinus nigra	black ash
	Fraxinus pennsylvanica	green ash
+	*Syringa vulgaris*	common lilac
	SCROPHULARIACEAE	**FIGWORT FAMILY**
+	*Linaria vulgaris*	butter-and-eggs
+	*Verbascum thapsus*	common mullein
	Veronica anagallis-aquatica	water speedwell
+	*Veronica officinalis*	common speedwell

STATUS	SCIENTIFIC NAME	COMMON NAME
+	*Veronica serpyllifolia*	thyme-leaved speedwell
	RUBIACEAE	MADDER FAMILY
	Galium mollugo	wild madder
	Galium palustre	marsh bedstraw
	Galium triflorum	fragrant bedstraw
	CAPRIFOLIACEAE	HONEYSUCKLE FAMILY
	Diervilla lonicera	bush honeysuckle
+	*Lonicera morrowii*	Morrow's honeysuckle
+	*Lonicera tatarica*	tartarian honeysuckle
	Viburnum acerifolium	maple-leaved viburnum
	Viburnum lentago	nannyberry
+	*Viburnum opulus*	guelder-rose
	Viburnum trilobum	high-bush cranberry
	DIPSACACEAE	TEASEL FAMILY
+	*Dipsacus follonum*	wild teasel
	ASTERACEAE	ASTER FAMILY
+	*Achillea millefolium*	yarrow
(+)	*Ambrosia artemisiifolia*	common ragweed
	Antennaria neglecta	field pussytoes
+	*Arctium minus*	common burdock
	Aster cordifolius	heart-leaved aster
	Aster lateriflorus	one-sided aster
	Aster macrophyllus	large-leaved aster
	Aster novae-angliae	New England aster
	Aster puniceus	purple-stemmed aster
	Bidens cernua	nodding beggars-ticks
	Bidens frondosus	devil's beggarticks
+	*Centaurea jacea*	brown knapweed
+	*Chrysanthemum leucanthemum*	ox-eye daisy
+	*Cichorium intybus*	chicory
+	*Cirsium arvense*	Canada thistle
+	*Cirsium vulgare*	bull thistle
	Conyza canadensis	horseweed
	Erigeron annuus	daisy fleabane

STATUS	SCIENTIFIC NAME	COMMON NAME
	Erigeron philadelphicus	Philadelphia fleabane
	Eupatorium maculatum	spotted Joe pye-weed
	Eupatorium perfoliatum	boneset
	Eupatorium rugosum	white snakeroot
	Euthamia graminifolia	grass-leaved goldenrod
+	*Hieracium caespitosum*	field hawkweed
+	*Matricaria matricarioides*	pineapple weed
	Rudbeckia hirta	black-eyed Susan
	Solidago altissima	tall goldenrod
	Solidago canadensis	Canada goldenrod
	Solidago flexicaulis	zig-zag goldenrod
	Solidago nemoralis	gray goldenrod
	Solidago rugosa	rough goldenrod
	Solidago altissima	tall goldenrod
+	*Sonchus arvensis*	perennial sow-thistle
+	*Sonchus oleraceus*	annual sow-thistle
+	*Taraxacum officinale*	dandelion
+	*Tragopogon dubius*	goat's-beard
+	*Tragopogon pratensis*	meadow goat's-beard
+	*Tussilago farfara*	coltsfoot
	ALISMATACEAE	WATER-PLANTAIN FAMILY
	Alisma plantago-aquatica	water plantain
	Sagittaria latifolia	broad-leaved arrowhead
	POTAMOGETONACEAE	PONDWEED FAMILY
+	*Potamogeton crispus*	curly pondweed
	Potamogeton pectinatus	sago pondweed
	Potamogeton zosteriformis	flat-stemmed pondweed
	LEMNACEAE	DUCKWEED FAMILY
	Lemna minor	common duckweed
	JUNCACEAE	RUSH FAMILY
	Juncus bufonius	toad rush
	Juncus tenuis	path rush
	CYPERACEAE	SEDGE FAMILY
	Carex bebbii	Bebb's sedge

STATUS	SCIENTIFIC NAME	COMMON NAME
	Carex communis	common sedge
	Carex comosa	bristly sedge
	Carex crinita	fringed sedge
	Carex deweyana	Dewey's sedge
	Carex granularis	meadow sedge
	Carex hystericina	porcupine sedge
	Carex interior	inland sedge
	Carex intumescens	bladder sedge
	Carex lupulina	hop sedge
	Carex pseudo-cyperus	cyperus-like sedge
	Carex rosea	rose sedge
	Carex stipata	awl-fruited sedge
	Carex vulpinoidea	foxtail sedge
	Eleocharis erythropoda	red-footed spike-rush
	Eleocharis obtusa	blunt spike-rush
	Scirpus atrovirens	dark green bulrush
	Scirpus cyperinus	wool-grass
	Scirpus microcarpus	red-sheathed bulrush
	POACEAE	**GRASS FAMILY**
+	*Agrostis gigantea*	redtop
+	*Agrostis stolonifera*	creeping bent grass
+	*Bromus inermis*	awnless brome grass
	Calamagrostis canadensis	Canada bluejoint grass
	Cinna latifolia	nodding wood grass
+	*Dactylis glomerata*	orchard grass
+	*Digitaria sanguinalis*	large crabgrass
+	*Elymus repens*	quack grass
	Elymus virginicus	Virginia wild rye
+	*Festuca pratensis*	meadow fescue
+	*Festuca rubra*	red fescue
	Glyceria grandis	tall manna grass
	Glyceria striata	fowl manna grass
	Leersia oryzoides	rice cut-grass
+	*Panicum capillare*	witch grass

STATUS	SCIENTIFIC NAME	COMMON NAME
	Phalaris arundinacea	reed canary grass
+	*Phleum pratense*	timothy
+	*Poa compressa*	Canada blue grass
	Poa palustris	fowl meadow grass
+	*Poa pratensis*	Kentucky blue grass
+	*Setaria viridis*	green foxtail
-	SPARGANIACEAE	BUR-REED FAMILY
	Sparganium eurycarpum	giant bur-reed
	TYPHACEAE	CATTAIL FAMILY
+	*Typha angustifolia*	narrow-leaved cattail
	Typha latifolia	common cattail
	PONTEDERIACEAE	PICKERELWEED FAMILY
	Pontederia cordata	heart-leaved pickerel-weed
	LILIACEAE	LILY FAMILY
	Allium tricoccum	wild leek
	Asparagus officinalis	garden asparagus
	Clintonia borealis	bluebead lily
+	*Convollaria majalis*	lily-of-the-valley
	Erythronium americanum	yellow trout-lily
+	*Hemerocallis fulva*	orange day-lily
	Maianthemum canadense	wild lily-of-the-valley
	Maianthemum racemosum	false Solomon's-seal
	Maianthemum stellatum	starry false Solomon's-seal
	Maianthemum trifolium	three-leaved Solomon's-seal
	Polygonatum pubescens	hairy Solomon's-seal
	Streptopus roseus	rose twisted-stalk
	Trillium erectum	red trillium
	Trillium grandiflorum	white trillium
	IRIDACEAE	IRIS FAMILY
	Iris versicolor	blue flag
	Sisyrinchium montanum	little blue-eyed grass
	SMILACEAE	SMILAX FAMILY
	Smilax herbacea	carrion-flower

STATUS	SCIENTIFIC NAME	COMMON NAME
	ORCHIDACEAE	ORCHID FAMLY
	Cypripedium calceolus var. parviflorum	yellow lady's slipper
	Epipactis helleborine	helleborine

APPENDIX B)
SUMMARY OF PHOSPHORUS EXPORT COEFFICIENTS

Land Use	Location	Land Use Type	Soil Type	P-Export (kg/ha/yr)	Reference	Cropland coefficient Miller and Spires (1978)
Forest						
	Haliburton County, Ontario	Climax hardwoods maple, beech, red oak, birch, hemlock		0.09	Schindler and Nighswander 1970	
	Southern Ontario	Mixed deciduous forest	sandy	0.025-0.077	Dillon and Kirchner 1975	
	Southern Ontario	Mixed deciduous forest	loam	0.067-0.145	Dillon and Kirchner 1975	
	Laurel Creek Southern Ontario		loam with some silt loam and clay	0.1	Winter and Duthie 2000	
	East Holland River Southern Ontario			0.145	LSRCA 2001	
	Lake Simcoe			0.06-0.07	Winter et al. 2002	
Mixed Agricultural						
	Ottawa, Ontario 594 ha	39% corn 46% legumes & grass 9% small grain 2% idle 4% roads	clay loam sandy loam	0.1-0.8	Patni and Hore 1978	
	Thames River Southern Ontario 5080 ha	37.4% soy/whitebean 27.1% cereal 23% corn	lacustrine clay over till plain over limestone	1.28-1.71	Coote et al. 1978	1.65

Land Use	Location	Land Use Type	Soil Type	P-Export (kg/ha/yr)	Reference	Cropland coefficient Miller and Spires (1978)
	Big Creek Southern Ontario 7913 ha	36.1% woodland 25.0% cereal 10.1% corn 22.2% tobacco 3% pasture/hay	deep level deltaic sands	0.26-0.36	Coote et al. 1978	0.65
	Ausable River Southern Ontario 6200 ha	31.3% corn 26.4% cereal 12.1% soy/whitebean 17.9% pasture/hay 7.5% woodland	level clay till plain over shale	0.77-0.91	Coote et al. 1978	0.56
	Grand River Southern Ontario 1860 ha	18.7% corn 35.3% cereal 37.2% pasture/hay 6.9% woodland	silty clay ground moraine	0.75-1.00	Coote et al. 1978	0.78
	Middle Thames River Southern Ontario 3000 ha	42.3% corn 12.2% cereal 22.0% pasture/hay 15.4% woodland	calcareous loamy till	0.81-1.53	Coote et al. 1978	0.81
	Maitland River Southern Ontario	12.3% corn 22.3% cereal 33.4% pasture/hay 29.2% woodland	drumlinized loam till	0.15-0.16	Coote et al. 1978	0.31
	Shelter Valley Creek Southern Ontario 5645 ha Twenty Mile Creek Southern Ontario 3025 ha	10.4% corn 10.7% cereal 28.5% pasture/hay 37.4% woodland 3.7% tobacco 16.2% corn 18.4% cereal 44.2% pasture/hay	windblown sand and silt on scoping sandy calcareous till lacustrine and reworked clay over dolomite	0.08-0.22 1.40-1.53	Coote et al. 1978 Coote et al. 1978	0.31 1.09

Land Use	Location	Land Use Type	Soil Type	P-Export (kg/ha/yr)	Reference	Cropland coefficient Miller and Spires (1978)
		17.8% woodland				
	Humber River Southern Ontario 2383 ha	11.3% corn 29.0% cereal 41.3% pasture/hay 7.5% woodland	stratified clay over shale and limestone	0.29-0.54	Coote et al. 1978	
	Hillman Creek Southern Ontario 1990 ha	22.8% corn 27.8% vegetables 8.9% cereal 7.9% soy/whitebean 10.0% woodland	shallow morraine sand over clay till plain over limestone	0.91-1.03	Coote et al. 1978	1.43
	Saugeen River Southern Ontario 4504 ha	9.5% corn 66.6% pasture/hay 12.1% cereal 9.4% woodland	reworked lacustrine clay over clay till	0.55-0.81	Coote et al. 1978	0.32
	Southern Ontario	>80% agriculture		0.05-2.3	Avadhanula 1979	
	Laurel Creek Southern Ontario	mixed grain oats, barley, wheat	loam with some silt loam and clay	0.25	Winter and Duthie 2000	
	Laurel Creek Southern Ontario	pasture	loam with some silt loam and clay	0.2	Winter and Duthie 2000	
	Lake Simcoe	mixed agriculture		0.11-0.54	Winter et al. 2002	
Urban						
	Montgomery Creek Kitchener, Ontario 958 ha	64% residential 13% recreational 12% commercial 6% transportation 1% industrial 4% woodland		0.757	O'Neill 1979	
	Schneider Creek	42% residential		2.047	O'Neill	

Land Use	Location	Land Use Type	Soil Type	P-Export (kg/ha/yr)	Reference	Cropland coefficient Miller and Spires (1978)
	Kitchener, Ontario 3577 ha	8% recreational 5% commercial 1% transportation 4% industrial 35% agriculture			1979	
	Southern Ontario	>60% urban		0.73-2.05	Avadhanula 1979	
	Laurel Creek Southern Ontario	low to mid-density residential	loam with some silt loam and clay	0.5	Winter and Duthie 2000	
	East Holland River Southern Ontario			2.01	LSRCA 2001	
	Lake Simcoe			1.32	Winter et al. 2002	

Table 1. Summary of Vegetation Types, Land Uses and Natural Environmental Designations in Atherley/Rama/Uptergrove Secondary Plan Areas

ELC Code	Vegetation Types(s)	Description	Environmental Designation(s)	Comments	Photo No.
Ag* (soybean)	B n/a	B large blocks of cash crop (soybean)	B none	B planted in 2005 B relatively flat to rolling terrain	1
Ag* (corn)	B n/a	B large blocks of cash crop (corn)	B none	B planted in 2005 B relatively flat to rolling terrain	2
Ag* (hay)	B n/a	B large blocks of cash/feed crop (hay)	B none	B planted in 2005 B relatively flat terrain	3
Ag* (clover)	B n/a	B large blocks of feed crop (clover)	B none	B planted in 2005 B relatively flat to rolling terrain	4

Ag* (fallow)	B n/a	B large blocks of fallow (idle) farmland	B none	B some blocks contain regenerating shrubs (dogwoods, willows)	5,6
Ag* (pasture)	B n/a	B small blocks of pastureland for cattle and horses	B none	B usually in close proximity to barn and farm	7
CUM1-1	B dry-moist old field meadow type	B old field species dominant, such as awnless brome grass, timothy, goldenrods, asters, common milkweed, goat's-beard, wild carrot	B none	B few examples within study area, as most are similar to fallow agricultural land that has not been in production for a number of years	8
CUT1-1	B sumac cultural thicket type	B dominated by shrubs such as staghorn sumac, choke cherry, willow, honeysuckle, with copses of pole-sized trembling aspen, largetooth aspen, white elm, white ash and red maple	B none	B derelict land naturally reverting to deciduous forest cover	9
FOD4-2	B dry-fresh white ash deciduous forest type	B dominated by white ash, with associates of white elm, trembling aspen, largetooth aspen and white birch	B none	B isolated tableland woodlot on relatively flat terrain B some stands previously fallow agricultural land naturally regenerating into a woodlot	

FOD5-8	B dry-fresh sugar maple-white ash deciduous forest type	B sugar maple, with sub-dominants of white ash, basswood and white elm	B none	B small isolated stands on relatively flat terrain	10
FOD6-1	B fresh-moist sugar maple-lowland ash deciduous forest type	B sugar maple along with green ash, black ash, white elm and basswood	B none	B small stands with mesic soils	
FOD6-4	B fresh-moist sugar maple-white elm deciduous forest type	B sugar maple dominant with sub-dominant of white elm	B none	B small stands associated with edges of intermittent swales on moist to wet soils	
FOD6-5	B fresh-moist sugar maple-hardwood deciduous forest type	B sugar maple dominant with associates of basswood, oak, red maple, white elm and poplar	B none	B stands situated on moist soils, with groundcover dominated by ferns	11
FOD7-2	B fresh-moist ash lowland deciduous forest type	B dominated by green ash and black ash, along with white elm, basswood, willows and red maple	B none	B unevaluated treed swamp	12

Table 1. (cont'd). Summary of Vegetation Types, Land Uses and Natural Environmental Designations in Atherley/Rama/Uptergrove Secondary Plan Areas

ELC Code	Vegetation Type(s)	Description	Environmental Designations	Comments	Photo No.
FOM5-2	B dry-fresh poplar mixed forest type	B dominated by trembling aspen and largetooth aspen in various combinations, along with white elm, white ash, and scattered white pine	B none	B naturally regenerating fallow agricultural land with early successional growth of poplars and white elm, with scattered white pine	13
FOM7-1	B fresh -moist white cedar-sugar maple mixed forest type	B white cedar with co-dominant of sugar maple, along with associates of white ash, white birch, white elm and red maple	B none	B barren and scattered lands on rocky ridge, naturally regenerating with conifers and deciduous trees and shrubs	
FOM7-2	B fresh-moist white cedar-hardwood mixed forest type	B lowland stands of eastern white cedar and black ash with associates of poplars, white birch, red maple and scattered white spruce	B none	B lowland stands associated with edges of treed swamp features B relatively flat terrain, with mesic to wet soils and seasonally pooled water	14
FOC2-2	B dry-fresh white cedar coniferous forest type	B dominated by eastern white cedar, with understorey of white spruce, white birch and poplars	B none	B upland stands on rolling terrain and rocky ridge	

SWD5-1	B black ash organic deciduous swamp type	B black ash dominant, with associates of red maple, tamarack, eastern white cedar and white birch B moist to wet saturated soils support groundcover of ferns, sedges and grasses	B part of provincially significant Mud Lake Wetland	B associated with low-lying flat topography with wet to saturated organic muck soils	
SWD6-2	B silver maple organic deciduous swamp type	B some stands dominated by silver maple B other stands have associates that include black ash, green ash, white ash, trembling aspen, red maple, white elm and basswood B groundflora dominated by sensitive fern, ostrich fern, lady fern, spotted jewelweed, sedges and grasses	B most stands of this feature type lie within parts of provincially significant Sucker Creek-Atherley Narrows	B associated with low-lying flat topography with wet to saturated organic muck soils	15, 16, 17, 18
SWD7-1	B white birch-poplar organic deciduous swamp type	B dominated by white birch, trembling aspen and balsam poplar	B units of this type lie within unevaluated wetlands	B associated with low-lying flat topography with wet to saturated organic muck soils	19
SWM4-1	B white cedar-hardwood organic mixed swamp type	B eastern white cedar dominant, along with hardwood associates such as black ash, silver maple, white elm and white pine	B lies within part of provincially significant McPhee Bay Wetland	B associated with low-lying flat topography with wet to saturated organic muck soils	
SWM6-1	B birch-conifer organic mixed swamp type	B white birch dominant with associates of eastern white cedar, balsam fir, yellow birch and poplar	B units of this type lie within unevaluated wetlands		

SWT3-2	B willow organic thicket swamp type	B dominated by slender willow, pussy willow, Bebb's willow, along with red-osier dogwood and speckled alder	B units of this type lie within unevaluated wetlands, as well as part	B associated with low-lying flat topography along edges of intermittent drainage swales	20

Table 1. (cont'd). Summary of Vegetation Types, Land Uses and Natural Environmental Designations in Atherley/Rama/Uptergrove Secondary Plan Areas

ELC Code	Vegetation Type(s)	Description	Environmental Designations	Comments	Photo No.
MAS3-1	B cattail organic shallow marsh type	B dominated by combination of narrow-leaved cattail and common cattail, with border of red-osier dogwoods and willows	B units lie within unevaluated wetlands, and portions of provincially significant McPhee Bay, Sucker Creek-Atherley Narrows and Mud Lake Wetlands	B associated with low-lying flat topography with wet to saturated organic muck soils	21
CUP3-2	B white pine coniferous plantation type	B dominated by planted white pine, managed stand	B none	B plantation on former agricultural land	22
CUP3-3	B Scotch pine coniferous plantation type	B dominated by planted Scotch pine, not managed	B none		

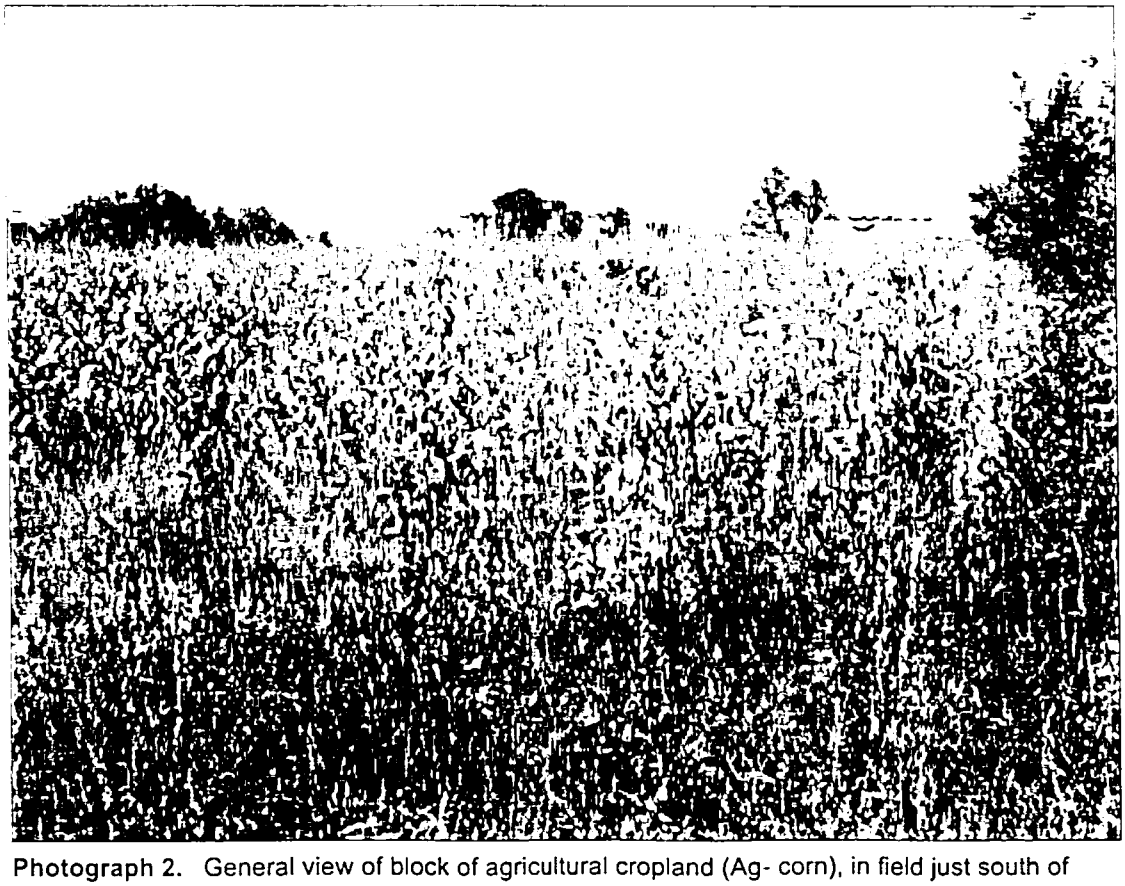
CUP3-8	B white spruce-European larch coniferous plantation type	B dominated by planted white spruce, no larch	B none	B part of Christmas tree farm	23
farm*	B n/a	B farmstead consisting of single-family dwelling, along with barn, sheds and/or paddocks	B none	B no large scale livestock farms (e.g., pig farm, chicken farm)	24
commercial*	B n/a	B variable uses including Casino Rama, parking lots, hotels, retail outlets, marinas, golf driving range	B none		25
industrial*	B n/a	B proposed industrial lots along north edge of Highway 7-12, just east of Rama Road 44, autowreckers yard	B none		
institutional*	B n/a	B school, firehall, water and sewage treatment plant	B none		
shoreline residential*	B n/a	B single-family permanent homes and cottages along shoreline of Lake Couchiching and Lake Simcoe	B none	B defined as housing units immediately along shoreline edge and opposite side of shoreline road	26.27

rural residential*	B n/a	B single-family permanent homes along sideroads and within subdivisions	B none	B defined as housing units along sideroads removed from shoreline and within existing and under construction subdivisions	
recreational*	B n/a	B Atherley Community Centre and sports field, hockey arena, rail trail	B none		28
cemetery*	B n/a	B situated along southern edge of Highway 7-12, just east of McNeil Road	B none		
gravel pit*	B n/a	B abandoned gravel/sand pit on Mara Airport lands and wayside pit on south edge of 13th Concession Road	B none		
landfill *	B n/a	B on Concession Road 2, east of Rama Road 44	B none		

Code * – refers to codes assigned to Ecosites, IN Lee, H.T., W. D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. Murray. 1998. **Ecological Land Classification for Southern Ontario: First Approximation and It's Application.** Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02

n/a – not applicable, no equivalent ecosite landscape unit within ELC system

Photograph 1. General view of block of agricultural cropland (Ag - soybean) on farmstead along southern edge of Benson Sideroad (Concession Road 2)



Photograph 2. General view of block of agricultural cropland (Ag- corn), in field just south of Casino Rama property

Photograph 3. General view of block of agricultural land (Ag - hay) along northern edge of Airport Road

Photograph 4. General view of a block of agricultural land (Ag- clover), along southern edge of Concession Road 1 (Mara-Rama Boundary Road), just west of Sideroad 25

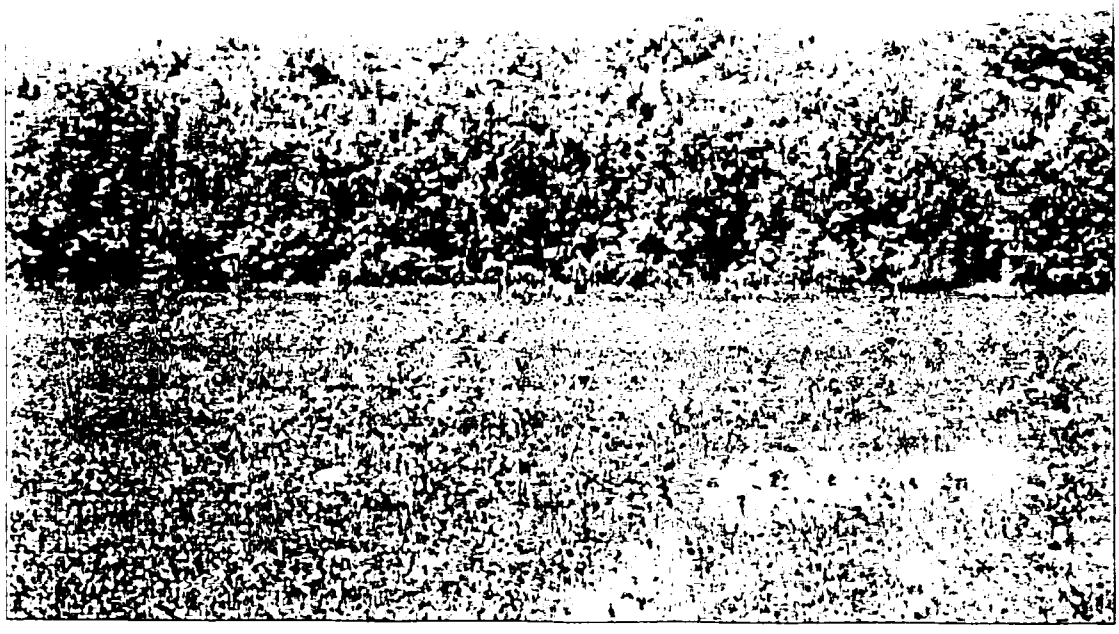
Photograph 5. General view a block of agricultural land (Ag - fallow), located as Rama Road 44 and Airport Road, consisting of old field species such as goldenrods, aster, common milkweed, common buttercup, ox-eye daisy, awnless brome grass, timothy and meadow fescue

Photograph 6. Block of agricultural land (Ag - fallow), not planted with a cash crop, located along northern edge of Orkney Beach Road

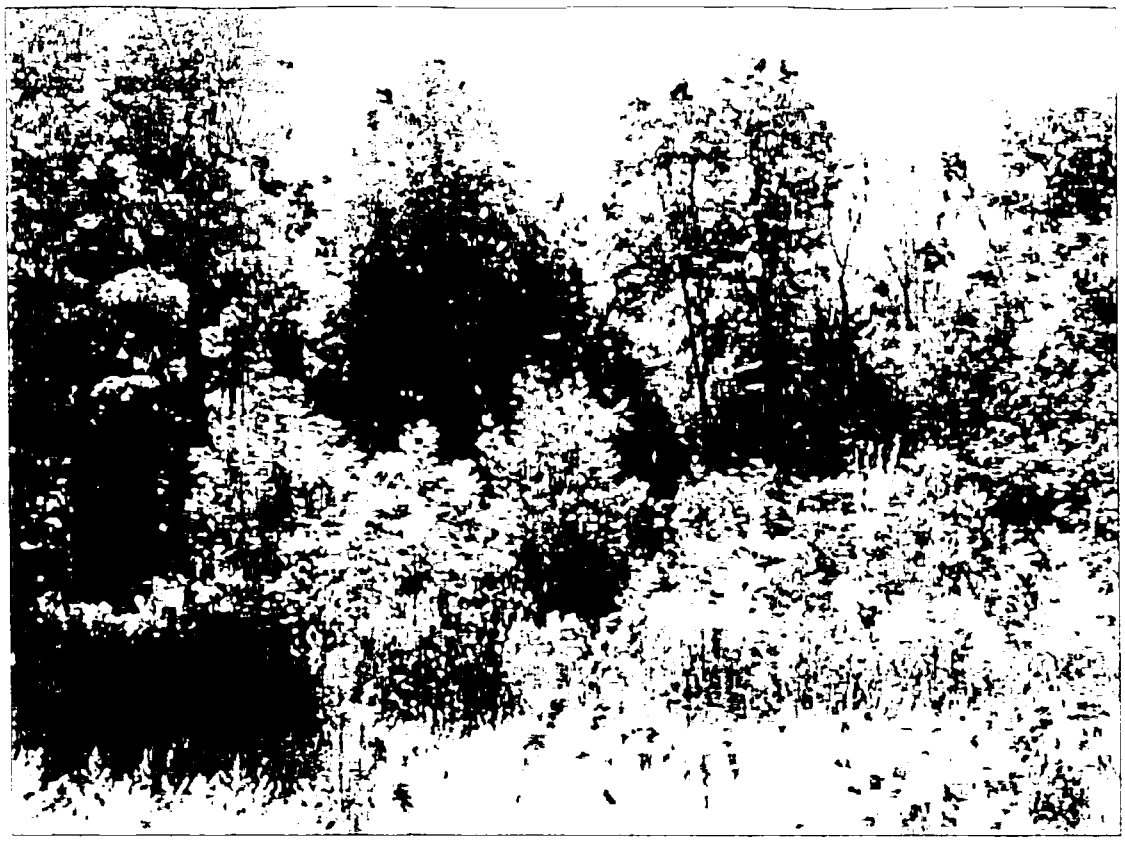
Photograph 7. General view of a block of agricultural land (Ag - pasture), grazing area for cattle, located along southern edge of Old Boundary Road, east of Sideroad 25.

Photograph 8. General view small block of dry-moist old field meadow type (CUM1-1), dominated by weeds and grasses, situated along western edge of Rama Road 44, just north of Longford Mills Road, next to Lake Couchiching Camp property

Photograph 9. General view of block of staghorn sumac cultural thicket (CUT1-1) with associates of common apple, white ash, Manitoba maple and trembling aspen



Photograph 10. General view of an upland stand of dry-fresh sugar maple-white ash deciduous forest type (FOD5-8), dominated by sugar maple and white ash, with associates of basswood, white elm and poplar, along with scattered white pine



Photograph 11. General view along edge of fresh-moist sugar maple-hardwood deciduous forest type (FOD6-5), dominated by sugar maple, along with associates of basswood, oak, red maple, white elm and poplar

Photograph 12. General view of inside stand of fresh-moist ash lowland deciduous forest type (FOD7-2), dominated by green ash, with sub-dominants of black ash, white elm, trembling aspen, basswood and willow shrubs, with a groundflora of ferns and sedges

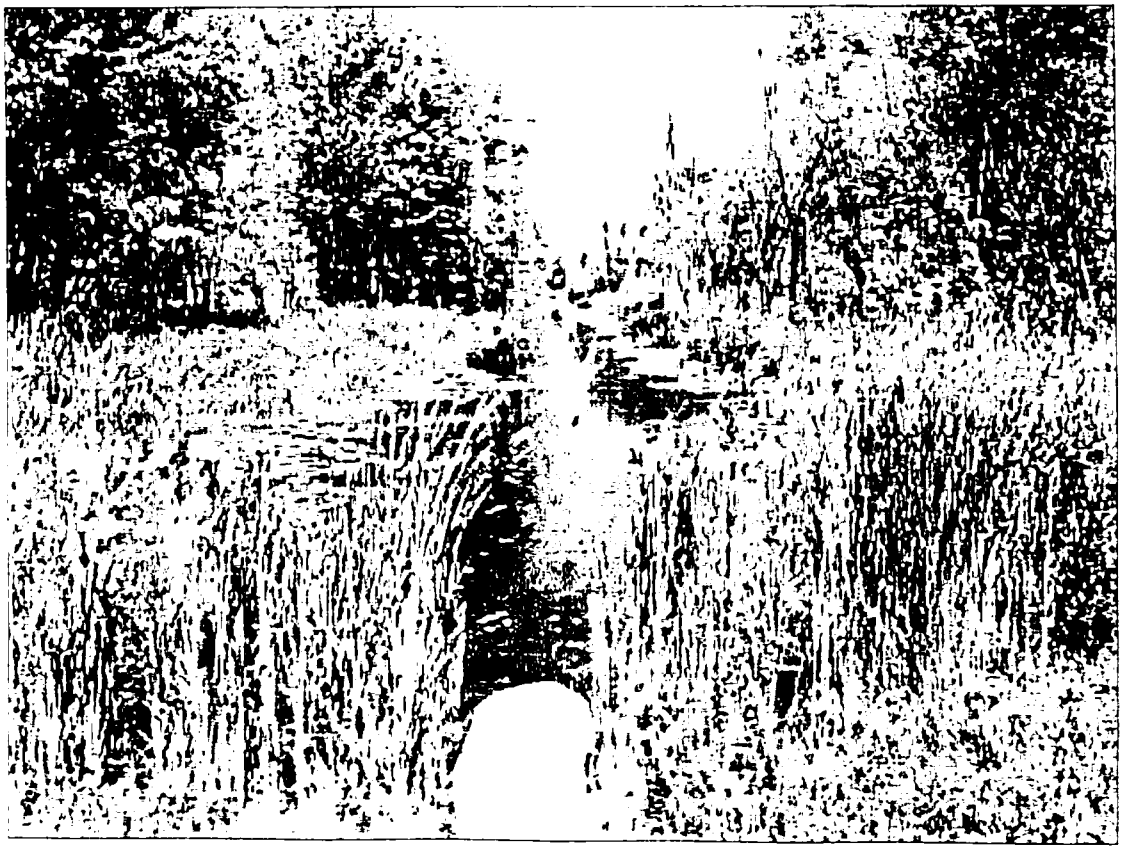
Photograph 13. General view of eastern edge of a stand of dry-fresh poplar mixed forest type (FOM5-2) dominated by trembling aspen, largetooth aspen, white elm, basswood, white ash and scattered eastern white cedar and white pine

Photograph 14. View of a portion of fresh-moist white cedar-hardwood mixed forest type (FOM7-2), dominated by eastern white cedar in conjunction with black ash, poplar, white birch, red maple and scattered white spruce

Photograph 15. General view inside a portion of Sucker Creek-Atherley Narrows wetland, along east side of Willison Sideroad, dominated by silver maple organic swamp (SWD6-2), along with red maple, white elm and green ash, sensitive fern, lady fern and spotted jewelweed

Photograph 16. View inside a portion of McPhee Bay wetland, situated a east end of Orkney Beach Road, dominated by silver maple organic swamp (SWD6-2), along with red maple, white elm, green ash, trembling aspen, black ash, sensitive fern, ostrich fern and cinnamon fern

Photograph 17. View of northern edge of unevaluated wetland unit (SWD6-2) along southern edge of Longford Mills Road, consisting of treed swamp dominated by silver maple, green ash, black ash, white elm, red-osier dogwood, willows, speckled alder, sensitive fern and sedges



Photograph 18. View of a portion of unevaluated wetland habitat (SWD6-2) to the north of Williams Road, dominated by silver maple, red maple, white elm, green ash, black ash, basswood, bisected by a drainage swale bordered by cattail marsh

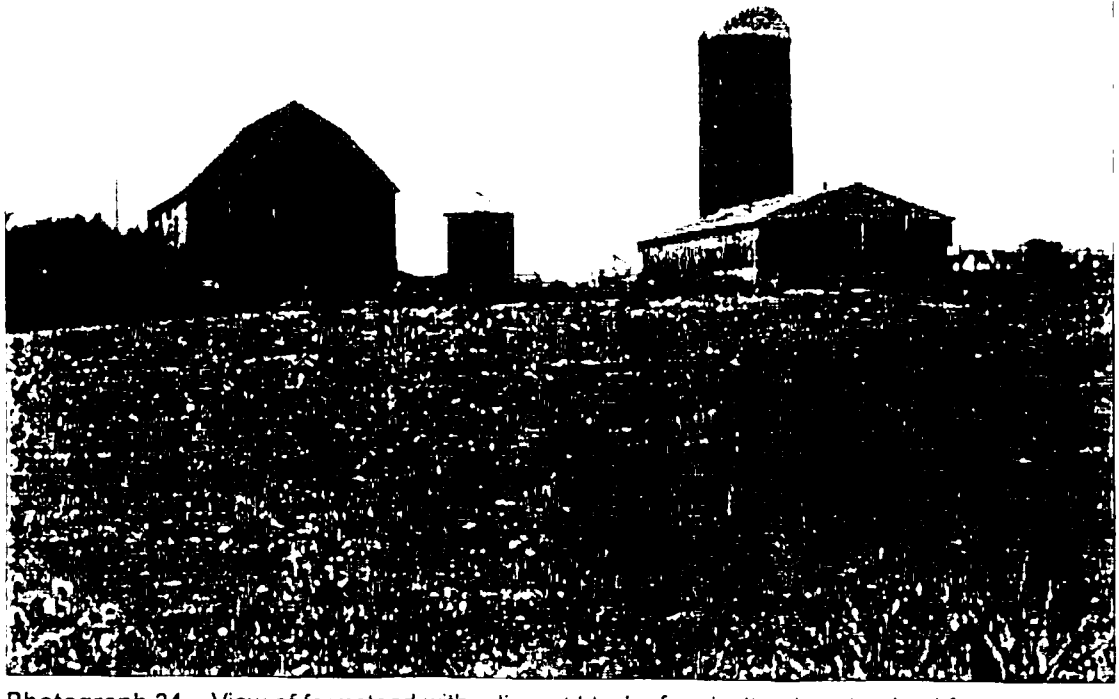
Photograph 19. Typical view of edge of white birch-poplar organic deciduous swamp type (SWD7-1), situated off of west edge of Willison Sideroad, just south of Concession Road 2, dominated by trembling aspen, balsam poplar, white elm, white birch, red maple and green ash

Photograph 20. Portion of Mud Lake wetland along south side of Concession Road 11, west of Sideroad 25, dominated by cattail marsh with a border of willow organic thicket swamp type (SWT3-2), containing pussy willow, slender willow, white elm and red-osier dogwood

Photograph 21. View of cattail organic marsh type (MAS3-1), part of provincially significant Mud Lake wetland, along south edge of Concession Road 11 west of 25th Sideroad, dominated by common and narrow-leaved cattails, with scattered willows, red-osier dogwood and white elm

Photograph 22. View of managed white pine coniferous plantation type (CUP3-2), situated on a large block of remnant agricultural land planted with white pine, situated along south edge of Concession Road 12, just east of Rama Road 44

Photograph 23. General view white spruce-European larch coniferous plantation type (CUP3-8), part of a Christmas tree farm situated along the eastern side of Sideroad 25, just south of Monck Road, also contains white pine and Scotch pine



Photograph 24. View of farmstead with adjacent block of agricultural pastureland for cattle, situated at intersection of Mara-Rama Boundary Road and 25th Sideroad

Photograph 25. Agricultural land converted to a golf driving range (commercial-recreational land use) at northeast intersection of Mara-Rama Boundary Road and Rama Road 44.

Photograph 26. Typical shoreline residential land use (SR- cottage) along southern edge of Orkney Beach Road with view of northeast shoreline of Lake Simcoe

Photograph 27 General view of permanent shoreline residential dwellings (SR), along north edge of Orkney Beach Road

Photograph 28 General view a portion of abandoned rail trail, an example of a recreational land use, located along north edge of Mara-Rama Boundary Road, just east of Rama Road 44, extends Highway 12 northward to east edge of Lake St. John

Table 2. List of wildlife species observed in the Atherley/Rama/Uptergrove Secondary Plan Area from June to October. 2005 through field work conducted by Michalski Nielsen Associates Limited[+] and/or derived from other sources (Birds Ontario 2001-2005[*]).

Common Name	Scientific Name	Breeding Evidence[*]
Birds		
common loon	*Gavia immer*	P*
pied-billed grebe	*Podilymbus podiceps*	S*
double-crested cormorant	*Phalacrocorax auritus*	X
American bittern	*Botaurus lentiginosus*	T*
great blue heron	*Ardea herodias*	H*[+]
green heron	*Ardea striatus*	CF*[+]
turkey vulture	*Cathartes aura*	H*[+]
Canada goose	*Branta canadensis*	FY*[+]
trumpeter swan	*Cygnus buccinator*	FY*
wood duck	*Aix sponsa*	FY*[+]
mallard	*Anas platyrhynchos*	P*[+]
blue-winged teal	*Anas discors*	P*
osprey	*Pandion haliaetus*	AE*
northern harrier	*Circus cyaneus*	T*[+]
sharp-shinned hawk	*Accipiter striatus*	H*
broad-winged hawk	*Buteo platypterus*	H*[+]
red-tailed hawk	*Buteo jamaicensis*	NE*[+]
American kestrel	*Falco sparverius*	T*[+]
ruffed grouse	*Bonasa umbellus*	H*
wild turkey	*Meleagris gallopavo*	FY*
Virginia rail	*Rallus limicola*	A*
sora	*Porzana carolina*	S*
common moorhen	*Gallinula chloropus*	S*
sandhill crane	*Grus canadensis*	S*
killdeer	*Charadrius vociferus*	DD*[+]
spotted sandpiper	*Actitis macularia*	H*

upland sandpiper	*Bartramia longicauda*	T*
common snipe	*Gallinago gallinago*	T*
American woodcock	*Scolopax minor*	T*+
ring-billed gull	*Larus delawarensis*	X
herring gull	*Larus argentatus*	H*
Caspian tern	*Sterna caspia*	X+
common tern	*Sterna hirundo*	V*
black tern	*Chlidonias niger*	H*
rock dove	*Columba livia*	H*
mourning dove	*Zenaida macroura*	FY*+
black-billed cuckoo	*Coccyzus erthropthalmus*	H*
whip-poor-will	*Caprimulgus vociferus*	T*

Birds (cont'd.)

ruby-throated hummingbird	*Archilochus colubris*	T*
belted kingfisher	*Ceryle alcyon*	CF*+
yellow-bellied sapsucker	*Sphyrapicus varius*	FY*+
downy woodpecker	*Picoides pubescens*	CF*+
hairy woodpecker	*Picoides villosus*	H*
northern flicker	*Colaptes auratus*	AE*+
pileated woodpecker	*Dryocopus pileatus*	H*+
eastern wood-pewee	*Contopus virens*	T*+
alder flycatcher	*Empidonax alnorum*	T*
willow flycatcher	*Empidonax traillii*	P*
least flycatcher	*Empidonax minimus*	T*
eastern phoebe	*Sayornis phoebe*	CF*+
great-crested flycatcher	*Myiachus crinitus*	P*+
eastern kingbird	*Tyrannus tyrannus*	FY*+
yellow-throated vireo	*Vireo flavifrons*	T*
warbling vireo	*Vireo gilvus*	T*
red-eyed vireo	*Vireo olivaceus*	T*+
blue jay	*Cyanocitta cristata*	CF*+
American crow	*Corvus brachyrhynchos*	P*+
common raven	*Corvus corax*	P*
tree swallow	*Tachycineta bicolor*	FY*+
bank swallow	*Riparia riparia*	AE*
cliff swallow	*Hirundo pyrrhonata*	NY*

barn swallow	*Hirundo rustica*	NY*+
black-capped chickadee	*Parus atricapillus*	FY*+
red-breasted nuthatch	*Sitta canadensis*	FY*+
white-breasted nuthatch	*Sitta carolinensis*	AE*
brown creeper	*Certhia americana*	H*+
Carolina wren	*Thryothorus ludovicianus*	NY*
house wren	*Troglodytes aedon*	AE*+
winter wren	*Troglodytes troglodytes*	S*
sedge wren	*Cistothorus platensis*	S*
marsh wren	*Cistothorus palustris*	NU*
blue-gray gnatcatcher	*Polioptila caerulea*	CF*
eastern bluebird	*Sialia sialis*	FY*
veery	*Catharus fuscescens*	P*
wood thrush	*Hylocichla mustelina*	T*+
American robin	*Turdus migratorius*	CF*+
gray catbird	*Dumetella carolinensis*	CF*+
brown thrasher	*Toxostoma rufum*	A*
European starling	*Sturnus vulgaris*	CF*+
cedar waxwing	*Bombycilla cedrorum*	N*+

Birds (cont'd.)

golden-winged warbler	*Vermivora chrysoptera*	P*
Nashville warbler	*Vermivora ruficapilla*	H*
yellow warbler	*Dendroica petechia*	T*+
chestnut-sided warbler	*Dendroica pensylvanica*	T*
black-throated green warbler	*Dendroica virens*	T*
pine warbler	*Dendroica pinus*	P*
cerulean warbler	*Dendroica cerulea*	T*
black-and-white warbler	*Mniotilta varia*	FY*
American redstart	*Setophaga ruticilla*	T*
ovenbird	*Seiurus aurocapillus*	T*
northern waterthrush	*Seiurus noveboracensis*	T*
mourning warbler	*Oporornis philadelphia*	CF*
common yellowthroat	*Geothlypis trichas*	CF*
scarlet tanager	*Piranga olivacea*	S*
eastern towhee	*Pipilo erythrophthalmus*	S*
chipping sparrow	*Spizella passerina*	FY*+
field sparrow	*Spizella pusilla*	T*

vesper sparrow	*Pooecetes gramineus*	H*+
savannah sparrow	*Passerculus sandwichensis*	A*+
song sparrow	*Melospiza melodia*	CF*+
swamp sparrow	*Melospiza georgiana*	T*
white-throated sparrow	*Zonotrichia albicolis*	T*+
norther cardinal	*Cardinalis cardinalis*	S*+
rose-breasted grosbeak	*Pheucticus ludovicianus*	T*+
indigo bunting	*Passerina cyanea*	P*
bobolink	*Dolichonyx oryzivorus*	CF*+
red-winged blackbird	*Agelaius phoeniceus*	CF*+
eastern meadowlark	*Sturnella vulgaris*	FY*
common grackle	*Quiscalus quiscula*	FY*+
brown-headed cowbird	*Molothrus ater*	FY*+
northern oriole	*Icterus galbula*	FY*+
purple finch	*Carpodacus purpureus*	S*
house finch	*Carpodacus mexicanus*	S*
American goldfinch	*Carduelis tristis*	P*+
house sparrow	*Passer domesticus*	S*+

Mammals

eastern cottontail	*Sylvilagus floridanus*	n/a+
groundhog	*Marmota monax*	n/a+
eastern chipmunk	*Tamias striatus*	n/a+
eastern gray squirrel	*Sciurus carolinensis*	n/a+
red squirrel	*Tamiasciurus carolinensis*	n/a+
striped skunk	*Mephistis mephistis*	n/a+
American porcupine	*Erethizon dorsatum*	n/a+
red fox	*Vulpes vulpes*	n/a

coyote	*Canis latrans*	n/a+
beaver	*Castor canadensis*	n/a+
raccoon	*Procyon lotor*	n/a+
white-tailed deer	*Odocoileus virginianus*	n/a+

Amphibians and Reptiles

spring peeper	*Pseudacris crucifer*	n/a
wood frog	*Rana sylvatica*	n/a+
American toad	*Bufo americanus*	n/a+
northern leopard frog	*Rana pipiens*	n/a+
green frog	*Rana clamitans*	n/a+
gray treefrog	*Hyla versicolor*	n/a+
bullfrog	*Rana catesbeiana*	n/a
snapping turtle	*Chelydra serpentina*	n/a
midland painted turtle	*Chrysemys picta*	n/a+
common garter snake	*Thamnophis sirtalis*	n/a+

* – breeding evidence based on OBBA data from 2001-2005

n/a – not applicable

Ontario Breeding Bird Atlas - Breeding Bird Evidence Glossary

CODE BREEDING BIRD EVIDENCE

OBSERVED

X Species observed in its breeding season. (no evidence of breeding). Presumed migrants should not be recorded

POSSIBLE BREEDING

H Species observed in its breeding season in suitable nesting habitat
S Single male(s) present, or breeding calls heard, in its breeding season in suitable nesting habitat

PROBABLE BREEDING

P Pair observed in their breeding season in suitable nesting habitat
T Permanent territory presumed through registration of territorial song on at least 2 days, a week or more apart, at the same place
D Courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult
B Brood patch on adult female or cloacal protuberance on adult male
N Nest-building or excavation of nest hole

CONFIRMED BREEDING

DD Distraction display or injury feigning
NU Used nest or egg shell found (occupied or laid within the period of the study)
FYRecently fledged young or downy young, including young incapable of sustained flight
AE Adults leaving or entering nest site in circumstances indicating occupied nest
FS Adult carrying faecal sac
CF Adult carrying food for young
NE Nest containing eggs
NY Nest with young seen or heard

Table 3. Land uses and phosphorus export coefficients selected for the Study Area (from Stantec Consulting Limited. Gartner Lee Limited and Michalski Nielsen Associates Limited [2005]. and Michalski Nielsen Associates Limted [2005]).

Land use	Phosphorus Export Coefficient (kilograms/hectare/year)
Forest	0.10
Wetland	0.16
Agriculture	

• Cash crops (carrots, corn, soybean, wheat)	0.47
• Hay	0.27
• Pasture	0.17
• Clover	0.67

• Fallow	0.28
• Paddocks	0.61
• Farmstead	1.32
Rural non-farm residential	0.50
Urban	2.01

Employment lands	1.00
Paved surfaces	0.50
Industrial lands (dry)	1.00
Commercial	1.00

Institutional/open space/recreational	0.30

Table 4. Pre and post-development phosphorus budget for the Atherley/Uptergrove area.

Phosphorus Loading (kg/yr)	OPTION 1 [1]			OPTION 2 [2]			OPTION 3 [3]		
	Existing	No SWMP Mitigation	Level 1 SWMP	Existing	No SWMP Mitigation	Level 1 SWMP	Existing	No SWMP Mitigation	Level 1 SWMP
Land Runoff	248	469	141	132	266	80	75	120	36
Shoreline Residential	280	280	280	280	280	280	280	280	280
Treated Sewage	–	11	11	–	7	7	–	–	–
Option 3 Effluent Standards									
• 0.3 mg/L = 398 kg/yr	–	–	–	–	–	–	–	398	398
• 0.15 mg/L= 197 kg/yr	–	–	–	–	–	–	–	197	197
Total	**528**	**760**	**432**	**412**	**553**	**367**	**355**	**798**	**714**
								597	**513**

[1] Option 1 = Individual Private Servicing
[2] Option 2 = Communal Subsurface Servicing
[3] Option 3 = Full Municipal Servicing

Table 5. Pre and post-development phosphorus budget for the Longford Mills area.

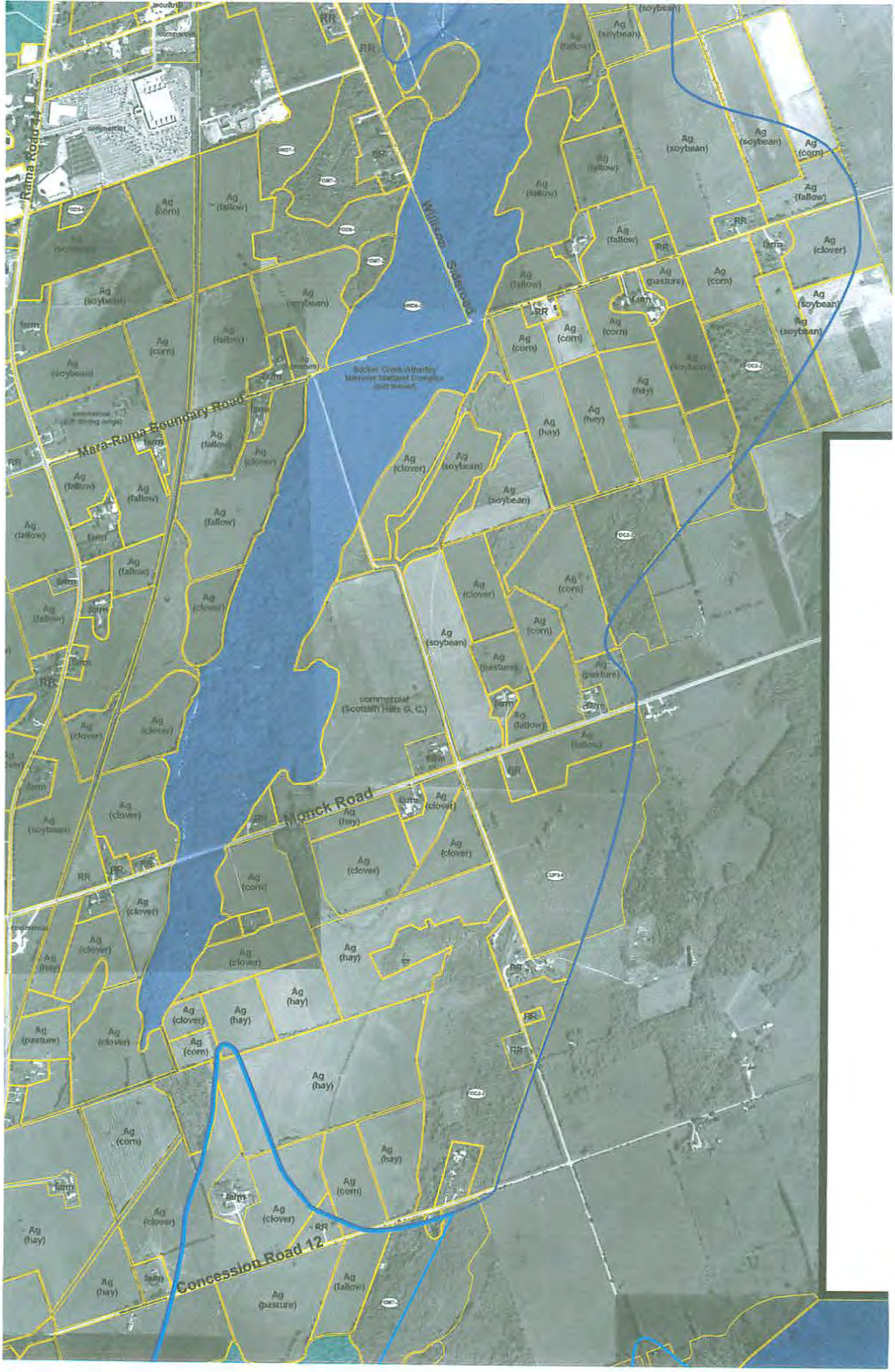
Phosphorus Loading (kg/yr)	OPTION 1 [1]			OPTION 2 [2]			OPTION 3 [3]		
	Existing	No SWMP Mitigation	Level 1 SWMP	Existing	No SWMP Mitigation	Level 1 SWMP	Existing	No SWMP Mitigation	Level 1 SWMP
Land Runoff	11	23	7	11	23	7	11	23	7
Shoreline Residential	0	0	0	0	0	0	0	0	0
Treated Sewage	–	1	1	–	1	1	–	–	–
Option 3 Effluent Standards									
• 0.3 mg/L = 66 kg/yr	–	–	–	–	–	–	–	66	66
• 0.15 mg/L= 33 kg/yr	–	–	–	–	–	–	–	33	33
• 0.10 mg/L = 22 kg/yr	–	–	–	–	–	–	–	22	22
	11	**24**	**8**	**11**	**24**	**8**	**11**	**89**	**73**
								56	**40**

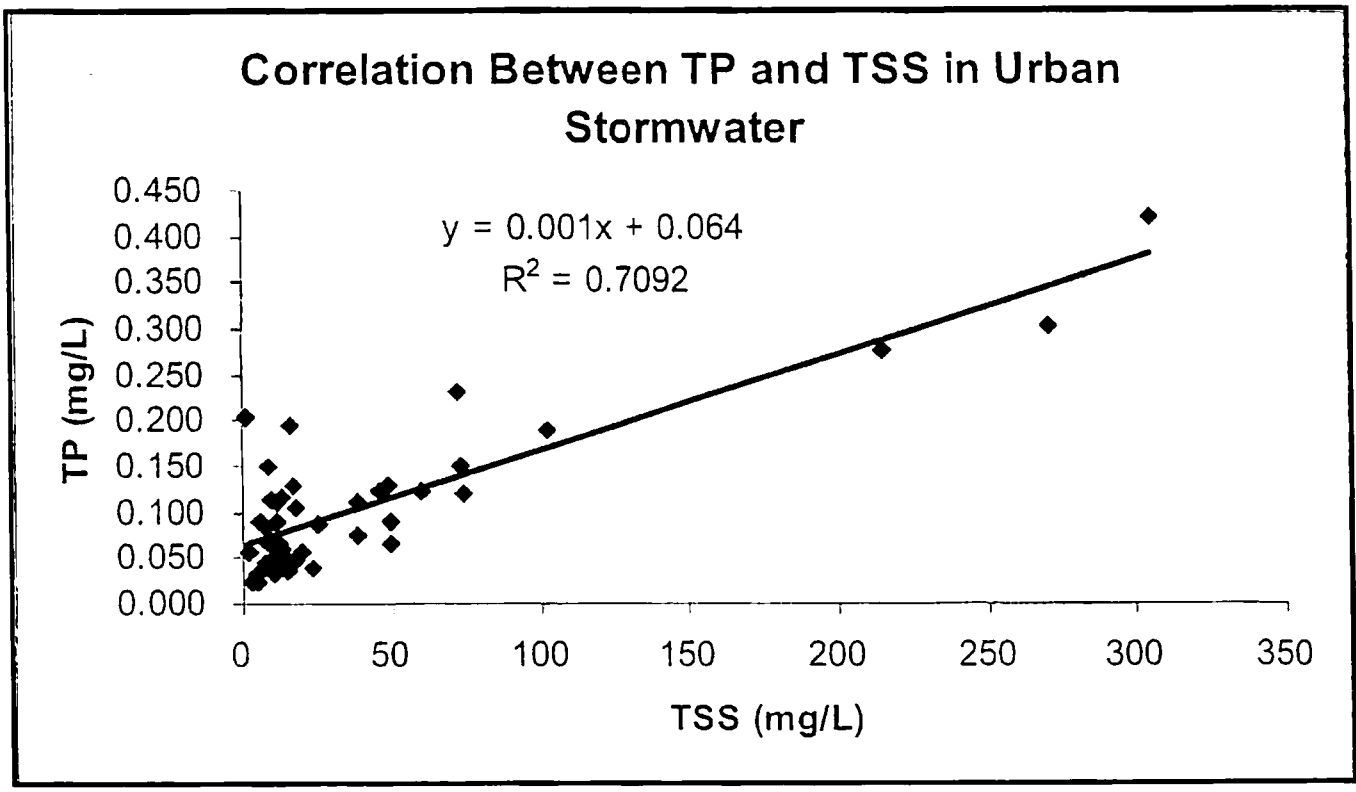
[1] Option 1 = Individual Private Servicing
[2] Option 2 = Communal Subsurface Servicing
[3] Option 3 = Full Municipal Servicing

Table 6. Pre and post-development phosphorus budget for the North Rama Road area.

Phosphorus Loading (kg/yr)	OPTION 1 [1]			OPTION 2 [2]			OPTION 3 [3]		
	Existing	No SWMP Mitigation	Level 1 SWMP	Existing	No SWMP Mitigation	Level 1 SWMP	Existing	No SWMP Mitigation	Level 1 SWMP
Land Runoff	16	16	5	16	16	5	16	16	5
Shoreline Residential	112	112	112	112	112	112	112	112	112
Treated Sewage	–	4	4	–	4	4	–	–	–
Option 3 Effluent Standards									
• 0.3 mg/L = 201 kg/yr	–	–	–	–	–	–	–	201	201
• 0.15 mg/L= 102 kg/yr	–	–	–	–	–	–	–	102	102
	128	**132**	**121**	**128**	**132**	**121**	**128**	**329**	**318**
								230	**219**

[1] Option 1 = Individual Private Servicing
[2] Option 2 = Communal Subsurface Servicing
[3] Option 3 = Full Municipal Servicing


Rama Road 44
Mara-Rama Boundary Road
Wilson Sideroad
Monck Road
Concession Road 12
commercial
(Scottish Hills G. C.)
Ag
(corn)
Ag
(soybean)
Ag
(fallow)
Ag
(clover)
Ag
(hay)
Ag
(pasture)
farm
RR



Data Source: Phosphorus Budget for the Big Bay Point Resort Development, Gartner Lee Limited, 2004

Project Name: Master Servicing Plan	Date Initiated: 04/01/06	Filemane: 0205 AtherleyFIgure3.cdr	**FIGURE 3**
Prepared For: Township of Ramara	Correlation between suspended solids and total phosphorus in urban stormwater		
Michalski Nielsen Associates Limited			

Rev. No:	Drawn By:	Scale:	Project Number:
0	EAS		0205

APPENDIX D:
EXCERPTS FROM 2002 TOWNSHIP OF RAMARA ROAD NEEDS STUDY

LEGEND – ROAD INVENTORY SECTIONS

The table below describes the data elements included (for sake of brevity, not all data elements are included in the tables, but are included in the full electronic database).

Section	Section number as per the previous Road Needs Study
Road Name	Local road name
From	Start of road section
To	End of road section
Length	Length of road section
Roadside Environment	Designation of • R – rural • S – semi-urban • U –urban
Surface Type	Road surface treatment • ETH – earth/dirt • GS – gravel, stone or other loose top • LCB – low class bituminous • HCB – high class bituminous • OTH – other
Number of Lanes	Number of driving lanes available
Existing Class MTO	Road classification as per MTO guidelines • 100 – rural road with AADT < 50 • 200 – rural road 50 ≤ AADT < 199 • 300 – rural road 200 ≤ AADT < 399 • 400 – rural road 400 ≤ AADT < 999 • 500 – rural road 1000 ≤ AADT < 1999 • LR – local residential • LCI – local commercial industrial • CR – collector residential • CCI – collector commercial industrial • ART – arterial
Existing Class O.Reg. 239/02	Road classification as per Ontario Regulation 239/02 re: minimum maintenance standards. Roads are classed 1 through 6 based on AADT and speed limits.
Condition Rating	Overall score (out of 100) used primarily to calculate improvement priorities. Considers the state of the following road elements: • horizontal and vertical alignment • surface condition • shoulder width • surface width • level of service (road capacity) • structural adequacy • drainage • maintenance demand
Need for Improvement	Identifies whether the road section has a deficiency based on the following and whether improvements are warranted (and when) or whether the deficiencies are to be addressed through maintenance. Deficiencies are based on the following: • surface type • surface width • road structure • drainage

Type of Improvement	Based on the identified need for an improvement, indicates recommended improvement • SR/SD – spot road/spot drainage improvement • R1/R2 – resurface with single/double lift • PR1/PR2 – pulverize and resurface with single/double lift • RW – road widening and resurface • W – road widening only • BS – base and surface improvements • REC – reconstruct • RSS – reconstruct with storm sewers
Time of Need	Indicates required improvements and the recommended timings
Total Cost	Estimate of the cost to implement the recommended improvement
Priority Rating	Rating number to identify improvement priorities based on the condition rating and traffic volumes (the greater the number, the greater the priority)
Priority Guide Number	Similar to the Priority Rating but considers the improvement costs in addition to the condition rating and traffic volumes (the greater the number, the greater the priority)

ROAD INVENTORY SECTIONS

Section No	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class MTO	Existing Class O.Reg 239/02	Condition Rating	Need for Improvement: Surface Type	Surface Width	Road Structure	Drainage	Improve vs Maintenance	Recommended Improvement: Type of Improvement	Time of Need	Total Cost	Ratings: Priority Rating	Priority Guide Number
4074	2nd Line	Smith Sideroad	Highway 169	2.20	R	GS	2	200	4	53	adeq	NOW	NOW	adeq	6-10	YES	REC	NOW	$731,487	30	0
4090	2nd Line	0.2 km East of Fish Sideroad	1.4 km East of Fish Sideroad	1.20	R	GS	2	100	6	80	adeq	adeq	adeq	adeq	6-10	maintain	none				
4092	2nd Line	1.4 km East of Fish Sideroad	East End	0.60	R	GS	2	100	6	72	adeq	adeq	adeq	adeq	6-10	maintain	none				
4076	3rd Line	Highway 169	Sideroad 17/18	1.80	R	GS	2	100	6	60	adeq	adeq	adeq	adeq	maintain	maintain	none				
4080	5th Line	Highway 169	Switch Road	3.40	R	GS	2	100	6	77	adeq	adeq	adeq	1-5	maintain	none					
4106	Airport Road	County Road 44	Fish Sideroad	1.70	R	HCB	2	400	5	89	adeq	adeq	adeq	6-10		none					
4108	Airport Road	Fish Sideroad	Bluebird Street	2.20	R	LCB	2	400	5	62	adeq	adeq	6-10	6-10	YES	PR1	1-5	$328,376	36	5
4100	Airport Road West	Rama Road 44	West End	0.10	R	GS	2	200	4	70	adeq	NOW	adeq	6-10	YES	W	NOW	$11,882	18	11
4026	Allan Carrick Road	Concession Road B/C	South End	0.90	R	GS	1	100	6	62	adeq	adeq	adeq	1-5	maintain	none					
3008A	Amiia Drive	Glenrest Drive	Louis Lane	0.50	S	GS	2	LR	6	55	NOW	NOW	adeq	1-5	YES	RW	NOW	$76,086	26	0
3008B	Amiia Drive	Louis Lane	East End	0.50	S	GS	2	LR	5	82	NOW	adeq	adeq	1-5	YES	R1	NOW	$58,486	12	0
3148	Anderson Avenue	Anderson Avenue	East End	0.40	S	GS	2	LR	5	61	NOW	NOW	adeq	6-10	YES	RW	NOW	$50,830	29	2
3150	Anderson Avenue	Sideroad 30	Anderson Avenue	1.00	S	GS	2	LR	5	71	NOW	adeq	adeq	1-5	YES	R1	NOW	$112,227	25	3
4170	Ash Crescent, Washago	Island Crescent	South End	0.30	S	LCB	2	LR	5	86	adeq	adeq	adeq	6-10		none					
4146	Ash Road	Glen Ellen Drive	Bedford Lane	0.10	R	GS	2	100	6	87	adeq	adeq	adeq	6-10	maintain	none					
3164	Balsam Road	Highway 12	Courtland Street	0.70	R	LCB	2	400	4	62	adeq	adeq	NOW	adeq	YES	BS	NOW	$163,623	39	13
3208	Balsam Road, Atherley	Creighton Street	Patricia Drive	0.20	U	LCB	2	LR	4	85	adeq	adeq	6-10	1-5	YES	RSS	NOW	$229,705	20	12
3210	Balsam Road, Atherley	Patricia Drive	Courtland Street	0.30	S	LCB	2	LR	4	67	adeq	adeq	1-5	adeq	YES	R1	1-5	$35,376	39	13
3018	Bayshore Dr, Bayshore Village	Sideroad 20	1.1 km West	1.10	S	HCB	2	LR	4	90	adeq	adeq	adeq	6-10		R1	6-10	$137,019	12	3
3020	Bayshore Dr, Bayshore Village	1.1 km West of Sideroad 20	Thickelwood Place	1.60	S	HCB	2	LR	4	91	adeq	adeq	adeq	6-10		R1	6-10	$199,300	9	1
3022	Bayshore Dr, Bayshore Village	Bayshore Drive	Lantern Court	0.55	S	HCB	2	LR	4	90	adeq	adeq	adeq	6-10		R1	6-10	$65,900	11	3
3024	Bayshore Dr, Bayshore Village	Lantern Court	Thickelwood Place	0.30	S	HCB	2	LR	4	89	adeq	adeq	adeq	6-10		R1	6-10	$35,945	11	2
3086	Bayview Avenue	McRae Park Road	North Shore Drive	0.70	S	GS	2	LR	5	58	NOW	NOW	adeq	1-5	YES	BS	NOW	$168,726	37	7
1012	Bayview Drive	Sideroad 15	West End	0.50	S	GS	2	LR	5	60	NOW	NOW	adeq	1-5	YES	RW	NOW	$76,086	30	2
4138	Beach Drive	Dock Road	South End	0.60	S	GS	2	LR	5	61	NOW	NOW	adeq	1-5	YES	RW	NOW	$100,051	27	1
4140	Beach Drive	Dock Road	0.5 km North	0.50	S	GS	2	LR	5	62	NOW	NOW	adeq	1-5	YES	RW	NOW	$58,159	26	1
1146	Beaver Trail, Lagoon City	Lake Avenue	East End	0.40	S	HCB	2	LR	5	75	adeq	adeq	6-10	adeq	YES	R1	1-5	$56,277	17	1
4144	Bedford Lane	Glen Ellen Drive	East End	0.20	S	GS	2	LR	5	83	NOW	adeq	adeq	6-10	YES	R1	NOW	$22,445	10	0
4174	Birch Drive, Washago	Fairground Road	North End	1.40	S	GS	2	LR	5	80	NOW	adeq	adeq	6-10	YES	R1	NOW	$163,402	15	1
4112	Bluebird Street	Sheba Drive	Airport Road	0.60	S	GS	2	LR	5	65	NOW	NOW	adeq	1-5	YES	RW	NOW	$80,547	23	1
4114	Bluebird Street	Airport Road	East End	0.90	S	LCB	2	LR	5	59	adeq	adeq	1-5	adeq	YES	PR1	1-5	$143,701	34	3
3052	Bonnie Beach Road	Sideroad 25	0.6 km West	0.60	S	GS	2	LR	6	58	NOW	NOW	adeq	1-5	YES	RW	NOW	$69,791	29	1
3054A	Bonnie Beach Road	Edgehill Road	0.2 km South	0.25	R	GS	2	200	5	61	adeq	NOW	adeq	6-10	YES	W	NOW	$35,947	27	0
3054B	Bonnie Beach Road	Muley Point Road (Concession 8)	Edgehill Road	0.25	R	HCB	2	300	5	86	adeq	adeq	adeq	6-10		none					
3220	Bridge Street, Atherley	Queen Street	West End	0.10	S	HCB	2	LCI	5	69	adeq	adeq	adeq	adeq		none					
4042	Brooks Sideroad	Highway 169	Fairground Road	0.90	R	GS	2	200	4	80	adeq	adeq	adeq	6-10		none					
1060	Canal Road	0.7 km East of Sideroad 5	0.7 km East	0.70	S	HCB	2	LR	4	83	adeq	adeq	6-10	6-10	YES	PR1	1-5	$127,087	17	2
1062	Canal Road	Sideroad 5	Sideroad 5	1.10	R	HCB	2	400	5	84	adeq	adeq	6-10	6-10	YES	PR1	1-5	$186,603	15	2
1064	Canal Road	Sideroad 5	Mara Eldon Boundary	0.60	R	HCB	2	300	5	72	adeq	adeq	6-10	adeq	YES	PR1	1-5	$101,833	24	2
5038	Canal Road	Sideroad 5	0.7 east of Sideroad 5	0.70	S	HCB	2	LR	4	89	adeq	adeq	adeq	adeq		none					
2040	Carol Ann Avenue	Stephanie Drive	West End	0.20	S	GS	1	LR	5	56	NOW	NOW	adeq	adeq	YES	RW	NOW	$42,624	27	0
3168	Caroline Street, Atherley	Courtland Street	Henry Street	0.20	S	HCB	2	LR	5	82	adeq	adeq	adeq	6-10		none					
3184	Champlain Avenue, Atherley	Pagel Street	South End	0.50	S	HCB	2	LR	5	80	adeq	adeq	6-10	6-10	YES	R1	1-5	$57,062	17	2
4152	Charles Lane Road	Ellis Drive	North End	0.10	R	GS	2	100	6	71	adeq	adeq	adeq	6-10	maintain	none					
4122	Church Road	Longford Mills Road	North End	0.80	R	GS	2	100	6	58	adeq	NOW	adeq	adeq	maintain	none					
1130	Church Street, Brechin	Concession Road 4	South End	0.30	S	HCB	2	LR	5	93	adeq	adeq	adeq	6-10		none					
1070	Concession Road 1	Lakeshore Drive	West End	0.10	R	GS	1	100	6	58	adeq	NOW	adeq	adeq	maintain	none					
1072	Concession Road 1	Lakeshore Drive	County Road 47	0.80	R	GS	2	300	4	77	adeq	adeq	adeq	adeq		none					
1074	Concession Road 1	County Road 47	Highway 12	2.50	R	GS	1	100	6	31	adeq	NOW	NOW	adeq	maintain	none					
1076	Concession Road 1	Highway 12	Sideroad 5	3.10	R	GS	2	200	4	82	adeq	adeq	adeq	6-10		none					
1078	Concession Road 1	Sideroad 5	Mara Eldon Boundary	3.20	R	GS	2	200	4	80	adeq	adeq	adeq	6-10		none					
2044	Concession Road 10	Sideroad 15	2.6 km East	2.60	R	HCB	2	300	4	68	adeq	adeq	1-5	adeq	YES	PR1	1-5	$406,531	28	2
2046	Concession Road 10	2.6 km East of Sideroad 15	Highway 169	0.60	S	HCB	2	LR	5	86	adeq	adeq	6-10	6-10	YES	R1	1-5	$82,139	12	1
2048	Concession Road 10	Highway 169	0.5 km East	0.50	S	HCB	2	LR	5	65	adeq	NOW	6-10	1-5	YES	REC	NOW	$185,314	28	3
2050	Concession Road 10	0.5 km East of Highway 169	Sideroad 5	2.60	R	GS	2	200	4	82	adeq	adeq	adeq	6-10		none					
2052	Concession Road 10	Sideroad 5	East End	1.60	R	GS	2	200	4	66	adeq	NOW	adeq	1-5	YES	W	NOW	$240,517	21	1
3110	Concession Road 10	Muley Point Road	East End	0.50	R	GS	2	100	6	54	adeq	NOW	adeq	1-5	maintain	none					
3112	Concession Road 10	Muley Point Road	Plum Point Road	1.30	R	GS	2	200	5	56	adeq	NOW	adeq	1-5	YES	W	NOW	$156,298	33	3

ROAD INVENTORY SECTIONS

Section No.	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class MTO	Existing Class O.Reg 239/02	Condition Rating	Need for Improvement: Surface Type	Need for Improvement: Surface Width	Need for Improvement: Road Structure	Need for Improvement: Drainage	Need for Improvement: Improve Vis. Maintenance	Recommended Improvement: Type of Improvement	Recommended Improvement: Time of Need	Recommended Improvement: Total Cost	Ratings: Priority Rating	Ratings: Priority Guide Number
3122	Concession Road 10	Sideroad 25	0.2 km West	0.20	R	GS	2	200	5	56	adeq	NOW	adeq	adeq	YES	W	NOW	$26,143	27	7
3124	Concession Road 10	0.2 km West of Sideroad 25	Fountain Drive	0.10	R	GS	2	100	6	47	adeq	NOW	NOW	adeq	maintain	none				
3128	Concession Road 10	Fountain Drive	West End	0.10	S	LCB	2	LR	5	66	adeq	NOW	adeq	6-10	YES	RW	NOW	$15,217	21	0
3146	Concession Road 10	Sideroad 30	West End Lake	0.40	R	GS	2	200	5	63	adeq	NOW	adeq	1-5	YES	W	NOW	$52,286	23	4
3224	Concession Road 10	Highway 12	Sideroad 15	1.70	R	HCB	2	300	4	96	adeq	adeq	adeq	6-10		none				
3226	Concession Road 11	Highway 12	Sideroad 25	2.30	R	GS	2	200	4	76	adeq	adeq	adeq	1-5		none				
3228	Concession Road 11	Sideroad 25	Sideroad 20	3.20	R	GS	2	200	4	69	adeq	NOW	adeq	6-10	YES	W	NOW	$342,852	23	1
3230	Concession Road 11	Sideroad 20	Fairvalley Road	1.30	R	GS	2	200	4	68	adeq	adeq	adeq	1-5		none				
3232	Concession Road 11	Fairvalley Road	Ramara Road 46	0.20	R	GS	2	200	4	68	adeq	NOW	aden	6-10	YES	W	NOW	$23,764	22	10
2054	Concession Road 12	Sideroad 15	Highway 169	3.10	R	GS	2	100	6	48	adeq	NOW	NOW	1-5	maintain	none				
2056	Concession Road 12	Highway 169	East End	0.10	R	ETH	2	100	6	30	adeq	NOW	NOW	NOW	maintain	none				
2058	Concession Road 12	Sideroad 5	East End	0.70	R	GS	2	100	6	57	adeq	adeq	adeq	1-5	maintain	none				
2060	Concession Road 12	Kirkfield Road	West End	0.60	R	GS	2	100	6	64	adeq	NOW	adeq	1-5	maintain	none				
3234	Concession Road 12	County Road 44	West End	0.30	R	GS	2	400	4	86	NOW	adeq	adeq	6-10	YES	RI	NOW	$33,851	13	3
3236	Concession Road 12	County Road 44	Sideroad 25	2.50	R	GS	2	200	4	69	adeq	adeq	adeq	6-10		none				
3238	Concession Road 12	Sideroad 25	0.7 km East	0.70	R	GS	2	200	4	60	adeq	NOW	adeq	6-10	YES	W	NOW	$96,986	27	3
3240	Concession Road 12	0.7 km East of Sideroad 25	1.3 km East of Sideroad 25	0.60	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
3242	Concession Road 12	Fairvalley Road	West End	0.30	R	GS	1	100	6	35	adeq	NOW	NOW	adeq	maintain	none				
3244	Concession Road 12	Fairvalley Road	Sideroad 15	1.90	R	GS	2	100	6	72	adeq	adeq	adeq	6-10	maintain	none				
2062	Concession Road 13	Sideroad 15	1.8 km East	1.80	R	GS	2	200	4	73	adeq	adeq	adeq	6-10		none				
2064	Concession Road 13	1.8 km East of Sideroad 15	Hwy 169	0.20	R	GS	2	100	6	66	adeq	adeq	adeq	6-10	maintain	none				
2066	Concession Road 13	Highway 169	East End	1.40	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
2068	Concession Road 13	Sideroad 5	West End	1.40	R	ETH	1	100	6	37	adeq	NOW	NOW	adeq	maintain	none				
2070	Concession Road 13	Sideroad 5	Mara-Carden Boundary	3.10	R	GS	2	200	4	56	adeq	NOW	adeq	NOW	YES	W	NOW	$381,168	28	1
3252	Concession Road 13	Fairvalley Road	West End	0.20	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
3254	Concession Road 13	Fairvalley Road	Sideroad 15	1.00	R	GS	2	200	4	76	adeq	adeq	adeq	6-10		none				
1084	Concession Road 2	Lakeshore Drive	West End	0.10	R	GS	1	100	6	67	adeq	NOW	adeq	adeq	maintain	none				
1086	Concession Road 2	Lakeshore Drive	County Road 47	0.40	R	LCB	2	200	4	70	adeq	adeq	adeq	adeq		none				
1088	Concession Road 2	County Road 47	Highway 12	2.10	R	GS	2	100	6	70	adeq	adeq	adeq	adeq	maintain	none				
1090	Concession Road 2	Highway 12	0.6 km East	0.60	R	HCB	2	500	3	74	adeq	adeq	adeq	adeq		none				
1092	Concession Road 2	0.6 km East of Highway 12	Sideroad 5	2.30	R	GS	2	200	4	75	adeq	adeq	adeq	6-10		none				
1094	Concession Road 2	Sideroad 5	0.6 km East	0.60	R	GS	2	100	6	71	adeq	adeq	adeq	adeq	maintain	none				
1096	Concession Road 2	0.6 km East of Sideroad 5	2.2 km East of Sideroad 5	1.60	R	ETH	1	100	6	99	adeq	NOW	adeq	adeq	maintain	none				
1102	Concession Road 3	Lakeshore Drive	West End	0.10	R	GS	1	100	6	66	adeq	NOW	adeq	6-10	maintain	none				
1104	Concession Road 3	Lakeshore Drive	Ramara Road 47	0.70	R	GS	2	200	4	75	adeq	adeq	adeq	6-10		none				
1106	Concession Road 3	County Road 47	Highway 12	1.80	R	GS	2	200	4	83	adeq	adeq	adeq	adeq		none				
1108	Concession Road 3	Highway 12	Sideroad 5	3.10	R	GS	2	200	4	76	adeq	adeq	adeq	6-10		none				
1110	Concession Road 3	Sideroad 5	0.5 km East	0.50	R	GS	2	100	6	67	adeq	adeq	adeq	6-10	maintain	none				
1112	Concession Road 3	0.5 km East of Sideroad 5	1.4 km East of Sideroad 5	0.90	R	ETH	1	100	6	37	adeq	NOW	NOW	adeq	maintain	none				
1126B	Concession Road 4	Church Street	100 m West of Cty Rd 47	0.70	S	HCB	2	LCI	4	96	adeq	adeq	adeq	adeq		none				
1126C	Concession Road 4	100 m West of Cty Road 47	County Road 47	0.10	R	HCB	2	500	4	85	adeq	adeq	6-10	adeq	YES	PR1	1-5	$19,190	19	5
1126A	Concession Road 4, Brechin	Highway 12	Church Street	0.15	S	HCB	2	LCI	4	94	adeq	adeq	adeq	6-10		none				
1176	Concession Road 5	Highway 12	0.6 km West	0.60	R	GS	1	100	6	55	adeq	NOW	adeq	6-10	maintain	none				
1178	Concession Road 5	Highway 12	Sideroad 5	3.00	R	GS	2	200	4	80	adeq	adeq	adeq	6-10		none				
1180	Concession Road 5	Sideroad 5	Mara-Carden Townline Road	3.10	R	GS	2	200	4	81	adeq	adeq	adeq	6-10		none				
2002	Concession Road 6	Highway 12	0.2 km West	0.20	R	HCB	2	200	4	82	adeq	adeq	adeq	adeq		none				
2004	Concession Road 6	0.2 km West of Highway 12	0.8 km West of Highway 12	0.60	R	GS	2	100	6	52	adeq	NOW	adeq	adeq	maintain	none				
2006	Concession Road 6	Highway 169	East End	1.70	R	GS	2	100	6	66	adeq	adeq	adeq	6-10	maintain	none				
2008	Concession Road 6	Mara-Carden Boundary	West End	1.40	R	GS	2	200	4	63	adeq	NOW	adeq	6-10	YES	W	NOW	$210,452	23	1
2010	Concession Road 7	Sideroad 15	Highway 12	2.30	R	HCB	2	400	4	79	adeq	adeq	adeq	adeq		none				
2012	Concession Road 7	Highway 12	Highway 169	0.90	R	GS	2	200	4	69	adeq	NOW	adeq	adeq	YES	W	NOW	$96,228	21	2
2014	Concession Road 7	Highway 169	1.4 km East	1.40	R	GS	2	200	4	66	adeq	NOW	adeq	6-10	YES	W	NOW	$149,687	21	1
2016	Concession Road 7	1.4 km East of Highway 169	3.7 km East of Highway 169	2.30	R	GS	1	100	6	35	adeq	NOW	NOW	adeq	maintain	none				
2018	Concession Road 7	Mara-Carden Townline Road	West End	1.00	R	GS	2	200	4	68	adeq	NOW	adeq	6-10	YES	W	NOW	$150,323	20	1
3002	Concession Road 7	Sideroad 15	Louis Lane	1.30	R	HCB	2	400	4	75	adeq	adeq	adeq	adeq		none				
3004	Concession Road 7	Sideroad 20	Louis Lane	1.00	R	HCB	2	400	4	87	adeq	adeq	adeq	6-10		none				
2024	Concession Road 8	Sideroad 15	Highway 12	1.30	R	GS	2	200	4	65	adeq	NOW	adeq	6-10	YES	W	NOW	$169,930	23	1
2026	Concession Road 8	Highway 12	Highway 169	1.80	R	GS	2	100	6	64	adeq	adeq	adeq	6-10	maintain	none				

ROAD INVENTORY SECTIONS

Section No	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class: MTO	Existing Class: O.Reg 239/02	Condition Rating	Need for Improvement: Surface Type	Need for Improvement: Surface Width	Need for Improvement: Road Structure	Need for Improvement: Drainage	Need for Improvement: Improve Maintenance	Recommended Improvement: Type of Improvement	Recommended Improvement: Time of Need	Recommended Improvement: Total Cost	Ratings: Priority Rating	Ratings: Priority Guide Number
2028	Concession Road 8	Highway 169	1 4 km East	1 40	R	GS	2	100	6	66	adeq	NOW	adeq	6-10	maintain	none				
2030	Concession Road 8	1 4 km East of Highway 169	2 1 km East of Highway 169	0 70	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
3046	Concession Road 8	0 3 km West of Sideroad 20	Muley Point Road	1 00	R	HCB	2	500	3	80	adeq	adeq	6-10	6-10	YES	PR1	1-5	$279,701	24	5
3064	Concession Road 8	Sideroad 15	West End	0 60	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
2032	Concession Road 9	Sideroad 15	Highway 12	0 40	R	GS	2	100	6	69	adeq	NOW	adeq	6-10	maintain	none				
2034	Concession Road 9	Highway 12	Hwy 169	2 70	R	GS	2	200	4	76	adeq	adeq	adeq	6-10		none				
2036	Concession Road 9	Highway 169	Dalrymple Lake	5 30	R	GS	2	300	4	78	adeq	adeq	adeq	6-10		none				
3066	Concession Road 9	Sideroad 15	1 2 km West	1 20	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
3068	Concession Road 9	Sideroad 20	2 0 km East	2 00	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
3070	Concession Road 9	Sideroad 20	Muley Point Road	1 90	R	GS	2	200	4	60	adeq	NOW	adeq	6-10	YES	W	NOW	$248,360	28	1
1042	Concession Road A	Lakeshore Drive	West End	0 10	R	GS	1	100	6	74	adeq	NOW	adeq	adeq	maintain	none				
1044	Concession Road A	Lakeshore Drive	Sideroad 15	0 60	R	LCB	2	200	4	79	adeq	adeq	adeq	adeq		none				
1046	Concession Road A	Sideroad 15	County Road 47	0 60	R	HCB	2	200	4	84	adeq	adeq	adeq	adeq		none				
1048	Concession Road A	County Road 47	0 4 km West of Highway 12	2 10	R	HCB	2	300	4	75	adeq	adeq	adeq	adeq		none				
1050	Concession Road A	0 4 km West of Highway 12	Highway 12	0 40	R	HCB	2	300	4	77	adeq	adeq	adeq	adeq		none				
1052	Concession Road A	Highway 12	East End	0 30	S	HCB	2	LR	5	85	adeq	adeq	adeq	adeq		none				
1056	Concession Road A	Canal Road	0 4 km West	0 40	S	GS	2	LR	5	63	NOW	NOW	adeq	6-10	YES	RW	NOW	$60,869	23	1
1058	Concession Road A	0 4 km West of Canal Road	0 5 km West of Canal Road	0 10	R	ETH	1	200	4	37	NOW	NOW	NOW	adeq	YES	REC	NOW	$28,913	39	10
1022	Concession Road B	Sideroad 15	West End	0 60	S	GS	2	LR	5	75	NOW	adeq	adeq	6-10	YES	R1	NOW	$67,336	19	1
1024	Concession Road B	Sideroad 15	County Road 47	0 60	S	GS	2	CR	4	84	NOW	adeq	adeq	adeq	YES	R1	NOW	$67,336	14	2
1026	Concession Road B	County Road 47	Furniss Drive	1 50	R	GS	2	200	4	67	adeq	NOW	adeq	6-10	YES	W	NOW	$176,417	30	2
1028	Concession Road B	Furniss Drive	East End	0 10	R	GS	1	200	4	75	adeq	NOW	adeq	adeq	YES	W	NOW	$15,451	17	13
4010	Concession Road B/C	Rama Dalton Boundary Road	West End	0 70	R	GS	2	100	6	62	adeq	NOW	adeq	6-10	maintain	none				
4014	Concession Road B/C	Highway 169	Sideroad 5/6	2 10	R	GS	2	200	4	81	adeq	adeq	adeq	6-10		none				
4016	Concession Road B/C	Sideroad 5/6	Pearl Carrick Road	1 30	R	GS	2	200	4	83	adeq	adeq	adeq	6-10		none				
4018	Concession Road B/C	Pearl Carrick Road	East End	0 30	R	GS	1	100	6	68	adeq	NOW	adeq	6-10	maintain	none				
4012	Concession Road D/E	Rama Dalton Boundary Road	West End	1 70	R	GS	2	100	6	63	adeq	adeq	NOW	6-10	maintain	none				
4020	Concession Road D/E	Highway 169	Given Road	0 90	R	GS	2	100	6	62	adeq	adeq	adeq	1-5	maintain	none				
4022	Concession Road D/E	Given Road	Sideroad 5/6	1 30	R	GS	1	100	6	35	adeq	NOW	adeq	adeq	maintain	none				
4038	Concession Road F/G	Highway 169	East End	1 10	R	GS	2	100	6	85	adeq	adeq	adeq	6-10	maintain	none				
4040	Concession Road H/I	Highway 169	East End	1 40	R	GS	2	200	4	82	adeq	adeq	adeq	6-10		none				
4054	Concession Road M/N	Cronk's Sideroad	0 8 km East	0 80	R	GS	2	200	4	41	adeq	NOW	NOW	adeq	YES	REC	NOW	$277,560	37	1
4056	Concession Road M/N	0 8 km East of Cronk's Sideroad	McArthurs Sideroad	1 40	R	GS	2	200	4	69	adeq	adeq	adeq	adeq		none				
4058	Concession Road M/N	McArthurs Sideroad	2 0 km East	2 00	R	GS	2	100	6	73	adeq	adeq	adeq	6-10	maintain	none				
4190	Coopers Road, Washago	Oakridge Drive	North End	0 80	S	GS	2	LR	5	64	NOW	NOW	adeq	6-10	YES	RW	NOW	$152,172	25	1
3170	Courtland Street, Atherley	Balsam Road	Caroline Street	0 30	S	HCB	2	LR	4	84	adeq	adeq	adeq	1-5		none				
3172	Courtland Street, Atherley	Caroline Street	Highway 12	0 30	S	HCB	2	LR	4	68	adeq	adeq	6 10	adeq	YES	R1	1-5	$37,610	34	7
3222	Courtland Street, Atherley	County Road 44	Highway 12	0 10	S	HCB	2	LR	5	79	adeq	adeq	adeq	adeq		none				
3186	Creighton Street, Atherley	Pagel Street	Balsam Road	0 60	S	HCB	2	LR	4	73	adeq	adeq	6 10	1-5	YES	R1	1 5	$70,752	26	6
3188	Creighton Street, Atherley	Balsam Road	Winchester Street	0 20	S	HCB	2	LR	4	82	adeq	adeq	6 10	1-5	YES	R2	1-5	$36,588	26	10
3190	Creighton Street, Atherley	Winchester Street	Highway 12	0 50	S	HCB	2	LR	4	75	adeq	adeq	6-10	1-5	YES	R2	1-5	$89,691	36	15
4066	Cronk's Sideroad	Fairground Road	Concession Road M/N	2 10	R	GS	2	200	4	40	adeq	NOW	NOW	adeq	YES	REC	NOW	$819,670	38	0
2042	Dalrymple Drive	Concession Road 9	South End	0 70	S	GS	2	LR	5	55	NOW	NOW	adeq	adeq	YES	RW	NOW	$106,520	31	1
3162	Daniel Street	McNeil Street	East End	0 15	S	LCB	2	LR	5	77	adeq	adeq	adeq	adeq		none				
4088	Davy Drive	Switch Road	North End	1 30	S	GS	2	LR	6	72	NOW	adeq	adeq	adeq	YES	R1	NOW	$145,895	18	1
4134	Dock Road	County Road 44	Beach Drive	0 20	R	LCB	2	300	5	59	adeq	adeq	6 10	adeq	YES	PR1	1 5	$26,625	32	2
4034	Donald Carrick Lane	Pearl Carrick Road	Donald Carrick Lane	0 90	R	GS	1	100	6	40	adeq	NOW	NOW	adeq	maintain	none				
4160	Doner Drive, Washago	Highway 169	South End	0 60	S	HCB	2	LR	5	87	adeq	adeq	adeq	6-10		none				
4166	East River Road, Washago	Highway 169	South End	1 00	S	LCB	2	LR	5	84	adeq	adeq	adeq	6-10		none				
3046	Edgehill Road	Bonnie Beach Road	East End	0 60	S	HCB	2	LR	5	71	adeq	adeq	6 10	adeq	YES	R1	1 5	$76,445	23	2
3202	Ellen Street, Atherley	Wellington Street	Patricia Drive	0 15	S	HCB	2	LR	5	80	adeq	adeq	adeq	adeq		none				
3204	Ellen Street, Atherley	Patricia Drive	Creighton Street	0 20	S	HCB	2	LR	5	82	adeq	adeq	adeq	adeq		none				
4150	Ellis Drive	County Road 44	West End	0 30	R	GS	2	200	5	67	adeq	NOW	adeq	1-5	YES	W	NOW	$35,645	20	4
1054	Ethel Drive	Concession Road A	South End	0 20	S	HCB	2	LR	5	75	adeq	adeq	adeq	adeq		none				
4044	Fairgrounds Road	Highway 169	Brooks Sideroad	1 30	R	HCB	2	400	4	78	adeq	adeq	adeq	adeq		none				
4046	Fairgrounds Road	Brooks Sideroad	Cronks Sideroad	2 10	R	HCB	2	400	4	78	adeq	adeq	adeq	adeq		none				
4048A	Fairgrounds Road	Cronk's Sideroad	500m East of Cronk's Sideroad	0 50	R	HCB	2	300	4	91	adeq	adeq	adeq	6 10		none				
4048B	Fairgrounds Road	500m East of Cronk's Sideroad	McArthurs Sideroad	1 60	R	LCB	2	300	4	69	adeq	adeq	6-10	adeq	YES	PR1	1-5	$270,147	28	1

ROAD INVENTORY SECTIONS

Section No	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class MTO	Existing Class O.Reg 239/02	Condition Rating	Need for Improvement: Surface Type	Need for Improvement: Surface Width	Need for Improvement: Road Structure	Need for Improvement: Drainage	Improve vs Maintenance	Recommended Improvement: Type of Improvement	Recommended Improvement: Time of Need	Recommended Improvement: Total Cost	Ratings: Priority Rating	Ratings: Priority Guide Number
4050A	Fairgrounds Road	McArthurs Sideroad	200 m East of McArthurs S/R	0.20	R	LCB	2	300	4	61	adeq	adeq	NOW	1.5	YES	BS	NOW	$41,817	32	19
4050B	Fairgrounds Road	200 m East of McArthurs S/R	600 m East of McArthurs S/R	0.40	R	GS	2	300	4	77	adeq	adeq	adeq	1.5		none				
4050C	Fairgrounds Road	600 m East of McArthurs S/R	800 m East of McArthurs S/R	0.20	R	LCB	2	300	4	73	adeq	adeq	adeq	6.10		none				
4050D	Fairgrounds Road	800 m East of McArthurs S/R	1450 m East of McArthurs S/R	0.65	R	GS	2	300	4	71	adeq	adeq	adeq	6.10		none				
4050E	Fairgrounds Road	1450 m East of McArthurs S/R	1500 m East of McArthurs S/R	0.05	R	LCB	2	300	4	83	adeq	adeq	adeq	6.10		none				
4050F	Fairgrounds Road	1500 m East of McArthurs S/R	Rama-Dalton Boundary Line	3.15	R	GS	2	300	4	72	adeq	adeq	adeq	6.10		none				
3280	Fairvalley Road	Ramara Road 46	Concession Road 11	0.10	R	GS	2	200	4	82	adeq	adeq	adeq	6.10		none				
3282	Fairvalley Road	Concession Road 11	Concession Road 12	1.50	R	GS	2	200	4	81	adeq	adeq	adeq	6.10		none				
3284	Fairvalley Road	Concession Road 12	Concession Road 13	1.40	R	GS	2	200	4	74	adeq	NOW	adeq	6.10	YES	W	NOW	$136,361	17	1
3286	Fairvalley Road	Concession Road 13	Monck Road	1.20	R	GS	2	200	4	70	adeq	NOW	adeq	6.10	YES	W	NOW	$116,881	21	2
3258	Fawn Bay Road	Mara-Rama Townline Road	South End	0.80	S	LCB	2	LR	5	76	adeq	adeq	adeq	1.5		none				
3246	Fern Resort Road	County Road 44	0.6 km West	0.60	R	HCB	2	400	4	92	adeq	adeq	adeq	adeq		none				
3248	Fern Resort Road	0.6 km West of County Road 44	Prospect Avenue	0.30	S	HCB	2	LR	5	73	adeq	adeq	adeq	1.5		none				
3038	Fernwood Lane, Bayshore V	Bayshore Drive	East End	0.15	S	HCB	2	LR	5	90	adeq	adeq	adeq	6.10		R1	6.10	$17,073	6	0
4104	Fish Sideroad	1.4 km North of 2nd Line	Airport Road	0.30	R	GS	2	100	6	84	adeq	adeq	adeq	6.10	maintain	none				
3182	Florence Avenue, Atherley	Champlain Avenue	East End	0.40	S	GS	2	LR	5	69	NOW	adeq	adeq	1.5	YES	BS	NOW	$96,415	20	2
1020	Florida Avenue	Concession Road B	North End	0.40	S	GS	2	LR	5	68	NOW	NOW	adeq	6.10	YES	RW	NOW	$52,264	22	1
3126	Fountain Drive	Concession Road 10	0.2 km North	0.20	S	GS	2	LR	5	55	NOW	NOW	adeq	1.5	YES	RW	NOW	$29,717	28	1
3130	Fountain Drive	Sideroad 25	0.5 km West	0.50	S	HCB	2	LR	5	82	adeq	adeq	adeq	6.10		none				
1010	Furniss Crescent	Sideroad 15	East End	0.10	S	LCB	2	LR	5	71	adeq	adeq	1.5	6.10	YES	R1	1.5	$11,223	20	1
1030	Furniss Drive	Concession Road B	South End	0.50	S	GS	2	LR	5	62	NOW	NOW	adeq	6.10	YES	RW	NOW	$76,086	26	1
4098	George Street	County Road 44	West End	0.10	S	GS	2	LR	5	90	NOW	NOW	adeq	6.10	YES	R1	NOW	$12,646	6	0
5014	Georgina Drive	Lakeshore Drive	East End	0.20	S	GS	2	LR	6	80	NOW	adeq	adeq	adeq	YES	R1	NOW	$22,445	12	0
4024	Given Road	Concession Road D/E	North End	0.50	R	GS	2	100	6	62	adeq	adeq	adeq	1.5	maintain	none				
1128	Gladstone Street, Brechin	Highway 12	Church Street	0.15	S	HCB	2	LR	5	93	adeq	adeq	adeq	6.10		none				
3092	Glen Cedar Drive	McRae Park Road	North Shore Drive	0.80	S	GS	2	LR	5	55	NOW	adeq	NOW	1.5	YES	BS	NOW	$192,830	35	4
4142	Glen Ellen Drive	0.5 km North of Dock Road	County Road 44	0.80	S	GS	2	LR	5	70	NOW	adeq	adeq	adeq	YES	R1	NOW	$92,475	21	1
3108	Glencoe Beach Road	McRae Park Road	North End	0.30	S	GS	2	LR	5	57	NOW	NOW	adeq	1.5	YES	BS	NOW	$72,311	32	8
3010	Glenrest Drive	Amilia Drive	Sideroad 20	1.60	S	GS	2	LR	5	51	NOW	NOW	adeq	NOW	YES	BS	NOW	$385,660	34	1
5010	Hannan Drive	County Road 47	Concession Road 3	0.65	S	HCB	2	LR	6	88	adeq	adeq	adeq	adeq		none				
3060	Harrys Lane	Edgehill Road	South End	0.30	S	HCB	2	LR	5	74	adeq	adeq	adeq	adeq		none				
3166	Henry Street, Atherley	Caroline Street	Highway 12	0.10	S	HCB	2	LR	5	81	adeq	adeq	adeq	6.10		none				
3096	Hilltop Road	Lakeview Drive	McRae Park Road	0.15	S	GS	2	LR	5	51	NOW	NOW	adeq	adeq	YES	RW	NOW	$16,372	30	1
5018	Holiday Road	Lakeshore Drive	East End	0.20	S	GS	2	LR	6	75	NOW	adeq	adeq	adeq	YES	R1	NOW	$22,445	13	0
4094	Hopkins Bay Road	County Road 44	West End	0.30	R	GS	2	200	5	69	adeq	NOW	adeq	6.10	YES	W	NOW	$32,076	19	4
4168	Island Crescent, Washago	East River Road	East End	0.40	S	LCB	2	LR	5	85	adeq	adeq	adeq	6.10		none				
4184	James Street, Washago	Highway 169	North End	0.20	S	GS	2	LR	6	64	NOW	NOW	adeq	6.10	YES	RW	NOW	$34,909	21	0
4186	James Street, Washago	Highway 169	Pineridge Road	1.20	S	LCB	2	LR	5	62	adeq	adeq	1.5	1.5	YES	R1	1.5	$143,612	30	3
3014	John Street	Glenrest Drive	Concession Road 7	0.30	S	GS	2	LR	5	64	NOW	NOW	adeq	6.10	YES	RW	NOW	$15,651	25	1
3090	Joyce Avenue	McRae Park Road	North End	0.10	S	GS	2	LR	6	58	NOW	NOW	adeq	adeq	YES	RW	NOW	$13,424	23	0
3104	Joyland Drive	McRae Park Road	South End	0.20	S	GS	2	LR	5	63	NOW	NOW	adeq	6.10	YES	RW	NOW	$33,478	25	1
4060	Kings River Road	2.0 km East of McArthurs Sideroad	Muskoka Road 6	0.90	R	GS	2	100	6	54	adeq	NOW	adeq	6.10	maintain	none				
5002	Kurtis Drive	Balsam Road	South Limit (Dead End)	0.60	S	HCB	2	LR	5	90	adeq	adeq	adeq	adeq		none				
1170	Laguna Parkway, Lagoon City	Concession Road 4	Poplar Crescent	1.10	S	HCB	2	LR	4	92	adeq	adeq	adeq	6.10		none				
1172	Laguna Parkway, Lagoon City	Poplar Crescent	Paradise Boulevard	0.70	S	HCB	2	LR	4	84	adeq	adeq	6.10	6.10	YES	R1	1.5	$87,104	17	4
4070	Laidlaw Avenue	County Road 52	South End	0.30	R	GS	1	200	5	46	adeq	NOW	adeq	adeq	YES	none				
1148	Lake Avenue, Lagoon City	Concession Road 4	Ridge Avenue	0.20	S	HCB	2	LR	4	92	adeq	adeq	adeq	6.10		none				
1150A	Lake Avenue, Lagoon City	Ridge Avenue	Beaver Trail	0.90	S	HCB	2	LR	4	78	adeq	adeq	adeq	adeq		none				
1150B	Lake Avenue, Lagoon City	Beavertrail	Poplar Crescent	0.50	S	HCB	2	LR	4	88	adeq	adeq	adeq	6.10		none				
1066	Lakeshore Drive	Concession Road A	Concession Road 1	1.40	S	LCB	2	LR	5	87	adeq	adeq	adeq	adeq		none				
1080	Lakeshore Drive	Concession Road 1	Concession Road 2	1.50	S	LCB	2	LR	5	86	adeq	adeq	adeq	adeq		none				
1098	Lakeshore Drive	Concession Road 2	0.9 km North of Conc Rd 2	0.90	S	LCB	2	LR	5	78	adeq	adeq	adeq	6.10		none				
1100	Lakeshore Drive	0.9 km North of Conc Rd 2	Concession Road 3	0.50	S	LCB	2	LR	5	66	adeq	NOW	adeq	6.10	YES	RW	NOW	$52,781	27	3
1114	Lakeshore Drive	Concession Road 3	Concession Road 4	1.40	S	LCB	2	LR	5	91	adeq	adeq	adeq	adeq		none				
3098	Lakeview Drive	Parkside Drive	Hilltop Road	0.15	S	GS	2	LR	5	62	NOW	NOW	adeq	1.5	YES	RW	NOW	$16,372	24	1
3102	Lakeview Drive	Parkside Drive	East End	0.50	S	GS	2	LR	5	89	NOW	adeq	adeq	adeq	YES	R1	NOW	$56,113	8	0
3032	Lantern Ct, Bayshore Village	Thickelwood Place	North End	0.10	S	HCB	2	LR	5	90	adeq	adeq	adeq	6.10		R1	6.10	$11,082	7	0
3036	Lavender Ct, Bayshore Village	Bayshore Drive	South End	0.05	S	HCB	2	LR	6	92	adeq	adeq	adeq	6.10		R1	6.10	$5,091	5	0

ROAD INVENTORY SECTIONS

Section No	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class MTO	Existing Class O.Reg 239/02	Condition % Rating	Need for Improvement: Surface Type	Surface Width	Road Structure	Drainage	Improve vs Maintenance	Recommended Improvement: Type of Improvement	Time of Need	Total Cost	Ratings: Priority Rating	Priority Guide Number
3120	Lawton Lane	Plum Point Road	West End	0.20	R	LCB	2	200	5	79	adeq	adeq	adeq	adeq		none				
3062	Leo Crescent	Edgehill Road	South End	0.20	S	HCB	2	LR	5	75	adeq	adeq	adeq	adeq		none				
1120	Lone Birch Trail	Concession Road 4	Maple Trail	0.30	S	LCB	2	LR	5	52	adeq	NOW	1-5	1-5	YES	BS	NOW	$72,311	34	7
1122	Lone Birch Trail	Maple Trail	West End	0.15	S	GS	2	LR	5	56	NOW	NOW	adeq	1-5	YES	RW	NOW	$21,750	28	1
4118	Longfordmills Road	County Road 44	East End	0.80	R	LCB	2	200	5	73	adeq	adeq	adeq	adeq		none				
4120	Longfordmills Road	County Road 44	West End	0.10	R	GS	2	100	6	31	adeq	NOW	NOW	adeq	maintain	none				
3006	Louis Lane	Amilia Drive	Concession Road 7	1.00	R	GS	2	200	5	56	adeq	NOW	adeq	6-10	YES	none				
4004	Lowanda Lane	Monck Road 45	South End	0.30	S	LCB	2	LR	6	91	adeq	adeq	adeq	6-10		none				
4126	Maple Avenue	County Road 44	West End	0.90	S	GS	2	LR	5	65	NOW	NOW	adeq	1-5	YES	RW	NOW	$171,193	24	1
3034	Maple Gate, Bayshore V	Sandlewood Trail	Bayshore Drive	0.50	S	HCB	2	LR	5	87	adeq	adeq	adeq	6-10		R1	6-10	$59,009	9	0
1118	Maple Trail	Waller Street	Lone Birch Trail	0.10	S	LCB	2	LR	5	61	adeq	NOW	adeq	6-10	YES	RW	NOW	$14,500	26	1
1196	Mara Carden Townline Road	Concession Road 4	0.7 km South	0.70	R	LCB	2	300	4	70	adeq	adeq	1-5	6-10	YES	BS	1-5	$134,163	25	4
2110	Mara Carden Townline Road	0.9 km North of Conc Road 7	1.1 km North of Conc Road 7	0.20	R	LCB	2	200	5	62	adeq	adeq	NOW	1-5	YES	BS	NOW	$30,358	29	16
1192	Mara Eldon Townline Road	Canal Road	Concession Road 1	1.50	R	LCB	2	300	4	63	adeq	adeq	6-10	adeq	YES	PR1	1-5	$221,232	31	2
1194	Mara Eldon Townline Road	Concession Road 1	Concession Road 2	1.40	R	ETH	1	300	4	37	NOW	NOW	NOW	adeq	YES	REC	NOW	$441,618	52	3
2072	Mara Rama Townline Road	Highway 169	West End	0.20	R	ETH	1	100	6	37	adeq	NOW	NOW	adeq	maintain	none				
2074	Mara Rama Townline Road	Highway 169	East End	0.80	R	ETH	1	100	6	37	adeq	NOW	NOW	adeq	maintain	none				
2076	Mara Rama Townline Road	Kirkfield Road	West End	1.20	R	ETH	1	100	6	37	adeq	NOW	NOW	adeq	maintain	none				
3256	Mara Rama Townline Road	County Road 44	Fawn Bay Road	0.20	S	LCB	2	LR	5	73	adeq	adeq	adeq	6-10		none				
3260	Mara Rama Townline Road	County Road 44	Willison Sideroad	1.50	R	GS	2	200	4	72	adeq	adeq	adeq	6-10		none				
3264	Mara Rama Townline Road	Sideroad 18	West End	0.20	R	GS	1	100	6	72	adeq	NOW	adeq	6-10	maintain	none				
3266	Mara Rama Townline Road	Sideroad 18	County Road 45	0.30	R	GS	1	100	6	37	adeq	NOW	NOW	adeq	maintain	none				
3262A	Mara Rama Townline Road	Willison Sideroad	1.0km East of Willison Sideroad	1.00	R	GS	2	200	4	65	adeq	NOW	adeq	6-10	YES	W	NOW	$117,611	27	5
3262B	Mara Rama Townline Road	1.0km East of Willison Sideroad	East End	0.60	R	GS	2	200	4	53	adeq	NOW	adeq	1-5	YES	W	NOW	$86,272	32	4
4052	Martinelli Subd. Road	Concession Road K/L	South End	0.20	R	GS	2	100	6	69	adeq	adeq	adeq	6-10	maintain	none				
1132	Mary Street, Brechin	County Road 47	O'Neill Street	0.15	S	HCB	2	LR	5	87	adeq	adeq	adeq	6-10		none				
4062	McArthurs Sideroad	Fairground Road	Concession Road M/N	2.10	R	GS	2	200	4	60	adeq	adeq	adeq	adeq		none				
4064	McArthurs Sideroad	Concession Road M/N	Muskoka Road 6	1.10	R	GS	2	200	4	73	adeq	adeq	adeq	adeq		none				
3158	McNeil Street	Highway 12	South End	0.30	S	LCB	2	LR	5	72	adeq	adeq	6-10	adeq	YES	R1	1-5	$38,107	22	2
4164	McNiece Crescent, Washago	Highway 169	South River Road	0.30	S	GS	2	LR	5	82	NOW	adeq	adeq	adeq	YES	R1	NOW	$41,193	11	0
3080	McRae Park Road	Muley Point Road	Sideroad 25	1.40	R	HCB	2	400	4	81	adeq	adeq	adeq	adeq		none				
3082	McRae Park Road	Sideroad 25	Woodland Drive	0.80	R	HCB	2	300	4	71	adeq	adeq	adeq	adeq		none				
3084	McRae Park Road	Woodland Drive	Hilltop Road	0.60	S	HCB	2	LR	4	88	adeq	adeq	adeq	1-5		none				
1036	Meadow Crest Lane	Suntrac Drive	South End	0.15	S	HCB	2	LR	6	100	adeq	adeq	adeq	adeq		none				
1040	Meadowlark Court	Syntrac Drive	North End	0.20	S	HCB	2	LR	6	99	adeq	adeq	adeq	adeq		none				
3040	Misty Court, Bayshore Village	Bayshore Drive	North End	0.20	S	HCB	2	LR	5	92	adeq	adeq	adeq	6-10		R1	6-10	$23,961	5	0
3072	Muley Point Road	Concession Road 8	Concession Road 9	1.40	R	HCB	2	300	3	81	adeq	adeq	6-10	6-10	YES	PR1	1-5	$243,819	24	6
3074	Muley Point Road	Concession Road 9	Highway 12	2.00	R	HCB	2	600	3	64	adeq	adeq	6-10	adeq	YES	PR2	1-5	$486,185	50	14
3048A	Muley Point Road	Muley Point Road	Bonnie Beach Road	0.60	R	HCB	2	300	4	84	adeq	adeq	adeq	adeq		none				
3048B	Muley Point Road	Bonnie Beach Road	Sideroad 25	0.60	R	GS	2	200	5	65	adeq	NOW	adeq	6-10	YES	W	NOW	$64,152	22	2
3088	North Shore Drive	Bayview Avenue	West End	0.30	S	GS	2	LR	5	56	NOW	NOW	adeq	NOW	YES	BS	NOW	$72,311	30	5
3094	North Shore Drive	Glen Cedar Drive	East End	0.20	S	GS	2	LR	6	58	NOW	NOW	adeq	1-5	YES	RW	NOW	$30,434	25	0
4156	Oak Point Road, Washago	Ramara/Severn Boundary	South End	1.00	S	GS	2	LR	5	62	NOW	NOW	adeq	6-10	YES	RW	NOW	$133,766	26	1
5046	Oakridge Drive	Pineridge Road	North End	0.85	S	GS	2	LR	5	69	NOW	adeq	adeq	6-10	YES	R1	NOW	$99,209	21	1
3216	Ogden Street, Atherley	Creighton Street	Queen Street	0.10	S	HCB	2	LR	5	98	adeq	adeq	adeq	adeq		none				
3218	Ogden Street, Atherley	Queen Street	West End	0.10	S	GS	2	LR	6	63	NOW	NOW	adeq	1-5	YES	RW	NOW	$15,217	21	0
4192	Old Grist Mill Road, Washago	Highway 169	North End	0.10	S	LCB	2	LR	5	80	adeq	adeq	adeq	6-10		none				
1164	Old Indian Trail, Lagoon City	Pine Tree Court	East End	0.30	S	HCB	2	LR	5	94	adeq	adeq	adeq	6-10		none				
1166	Old Indian Trail, Lagoon City	Pine Tree Court	West End	0.30	S	HCB	2	LR	5	94	adeq	adeq	adeq	6-10		none				
4002	Old Orkney Sideroad	County Road 45	South End	0.25	R	GS	2	100	6	79	adeq	adeq	adeq	6-10	maintain	none				
1134	O'Neill Street, Brechin	Highway 12	West End	0.20	S	HCB	2	LR	5	88	adeq	adeq	adeq	6-10		none				
3136	Orkney Beach Road	Orkney Heights	East End	0.30	S	GS	2	LR	5	63	NOW	NOW	adeq	1-5	YES	RW	NOW	$50,217	24	1
3138	Orkney Beach Road	Orkney Heights	Sideroad 27	0.50	S	HCB	2	LR	5	92	adeq	adeq	adeq	6-10		none				
3142	Orkney Beach Road	Sideroad 27	0.9 km West	0.90	S	HCB	2	LR	5	92	adeq	adeq	adeq	6-10		none				
3144	Orkney Beach Road	0.9 km West of Sideroad 27	Sideroad 30	1.00	R	HCB	2	300	5	77	adeq	adeq	adeq	6-10		none				
3134	Orkney Heights	Highway 12	Concession Road 10	0.90	S	LCB	2	LR	4	89	adeq	adeq	adeq	6-10		none				
3198	Paget Street, Atherley	Creighton Street	Patricia Drive	0.20	S	LCB	2	LR	5	91	adeq	adeq	adeq	6-10		none				
3200	Paget Street, Atherley	Patricia Drive	Wellington Street	0.15	S	HCB	2	LR	5	80	adeq	adeq	adeq	adeq		none				

ROAD INVENTORY SECTIONS

Section No	Road Name	From	To	Length (km)	Roadside Env't	Surface Type	Number of Lanes	Existing Class: MTO	Existing Class: O Reg 239/02	Condition Rating	Need for Improvement: Surface Type	Need for Improvement: Surface Width	Need for Improvement: Road Structure	Need for Improvement: Drainage	Need for Improvement: Improve vs Maintenance	Recommended Improvement: Type of Improvement	Recommended Improvement: Time of Need	Recommended Improvement: Total Cost	Ratings: Priority Rating	Ratings: Priority Guide Number
1174	Paradise Boulevard,Lagoon City	Laguna Parkway	West End	1.10	S	LCB	2	LR	5	73	adeq	adeq	adeq	adeq		none				
4180	Park Lane Crescent, Washago	Riverleigh Drive	Riverleigh Drive	1.50	S	HCB	2	LR	5	82	adeq	adeq	adeq	6.10		none				
3026	Park Lane, Bayshore Village	Bayshore Drive	West End	0.30	S	HCB	2	LR	5	91	adeq	adeq	adeq	6.10		R1	6-10	$37,369	6	0
3100	Parkside Drive	Lakeview Drive	McRae Park Road	0.20	S	GS	2	LR	5	64	NOW	NOW	adeq	6.10	YES	RW	NOW	$33,478	25	1
3176	Patricia Drive, Atherley	Paget Street	Balsam Road	0.70	S	LCB	2	LR	5	84	adeq	adeq	6.10	6.10	YES	R1	1-5	$85,201	11	1
3178	Patricia Drive, Atherley	Balsam Road	Winchester Street	0.20	S	LCB	2	LR	5	81	adeq	adeq	6.10	6.10	YES	R1	1-5	$22,825	15	1
3180	Patricia Drive, Atherley	Winchester Street	Courtland Street	0.50	S	LCB	2	LR	5	73	adeq	adeq	adeq	adeq		none				
4032	Pearl Carrick Road	Concession Road B/C	North End	2.40	R	GS	2	100	6	68	adeq	adeq	adeq	6.10	maintain	none				
1136	Perry Avenue, Brechin	Concession Road 4	North End	0.70	S	HCB	2	LR	5	95	adeq	adeq	adeq	6.10		none				
3012	Peter Street	Glenrest Drive	Concession Road 7	0.40	S	GS	2	LR	5	64	NOW	NOW	adeq	6.10	YES	RW	NOW	$60,869	26	1
1160	Pine Tree Court, Lagoon City	Poplar Crescent	South End	0.30	S	HCB	2	LR	5	90	adeq	adeq	adeq	6.10		none				
1162	Pine Tree Court, Lagoon City	Poplar Crescent	Old Indian Trail	0.20	S	HCB	2	LR	5	97	adeq	adeq	adeq	adeq		none				
5044	Pineridge Road	Oakridge Drive	South end	0.45	S	GS	2	LR	5	66	NOW	adeq	adeq	6.10	YES	R1	NOW	$52,522	23	1
4188	Pineridge Road, Washago	Oak Ridge Drive	South End	0.50	S	GS	2	LR	5	64	NOW	NOW	adeq	6.10	YES	RW	NOW	$95,107	22	0
3116	Plum Point Road	South End	Concession Road 10	1.00	S	LCB	2	LR	5	69	adeq	adeq	1-5	1-5	YES	R1	1-5	$114,125	26	3
3118	Plum Point Road	Concession Road 10	Highway 12	0.80	R	LCB	2	300	5	72	adeq	adeq	adeq	adeq		none				
1152	Poplar Crescent, Lagoon City	Laguna Parkway	West End	1.30	S	HCB	2	LR	4	90	adeq	adeq	adeq	6.10		none				
4182	Poplar Lane, Washago	Park Lane Crescent	North End	0.30	S	HCB	2	LR	5	69	adeq	NOW	adeq	6.10	YES	RW	NOW	$43,619	19	0
4128	Portage Bay Road	County Road 44	West End	0.20	S	HCB	2	LR	5	72	adeq	NOW	adeq	6.10	YES	RW	NOW	$23,264	19	1
5000	Prophet Park Crescent	Concession Road 10	Concession Road 10	0.40	S	HCB	2	LR	5	90	adeq	adeq	adeq	adeq		none				
3250	Prospect Avenue	Fern Resort Road	South End	0.30	S	HCB	2	LR	5	80	adeq	adeq	adeq	1-5		none				
4124	Quarry Point Road	County Road 44	West End	0.40	R	GS	2	200	4	63	adeq	NOW	adeq	1-5	YES	W	NOW	$50,383	25	6
3194	Queen Street, Atherley	Odgen Street	South End	0.10	S	HCB	2	LR	6	76	adeq	NOW	adeq	adeq	YES	RW	NOW	$11,632	13	0
3196	Queen Street, Atherley	Odgen Street	Highway 12	0.30	S	HCB	2	LR	5	92	adeq	adeq	adeq	6.10		none				
5048	Rama Dalton Boundary Rd	Fairgrounds Rd	1.0 km South	1.00	R	GS	2	300	4	69	adeq	adeq	adeq	6.10		none				
5006	Ramara Road 46	Highway 12	Sideroad 15	2.85	R	HCB	2	500	3	88	adeq	adeq	adeq	adeq		none				
5008	Ramara Road 46	Sideroad 15	County Road 169	3.00	R	HCB	2	500	3	78	adeq	adeq	6.10	6.10	YES	PR1	1-5	$587,170	26	6
5020	Ramara Road 47	Talbot River Bridge	Stone Gate Road	1.00	S	HCB	2	LR	4	62	adeq	adeq	6.10	1-5	YES	BS	6-10	$241,038	42	12
5022	Ramara Road 47	Stone Gate Road	Concession A	2.30	R	LCB	2	400	4	87	adeq	adeq	adeq	adeq		none				
5024	Ramara Road 47	Concession Road A	Concession 1	1.30	R	LCB	2	400	4	89	adeq	adeq	adeq	adeq		none				
5026	Ramara Road 47	Concession 1	Concession 2	1.70	R	LCB	2	400	4	87	adeq	adeq	adeq	adeq		none				
5028	Ramara Road 47	Concession 2	Concession 3	1.30	R	LCB	2	400	4	88	adeq	adeq	adeq	adeq		none				
5030	Ramara Road 47	Concession 3	Simcoe Road	1.55	R	LCB	2	400	4	86	adeq	adeq	adeq	adeq		none				
5032	Ramara Road 47	Simcoe Road	Railway Crossing	0.80	R	HCB	2	700	3	79	adeq	adeq	adeq	adeq		none				
5034	Ramara Road 47	Railway Crossing	Highway 12	0.35	U	HCB	2	LR	4	78	adeq	adeq	6-10	6-10	YES	RSS	NOW	$384,196	34	17
5036	Ramara Road 51	Concession Road A/ Hwy 12	200m east / Talbot river	0.20	S	HCB	2	LR	5	81	adeq	adeq	adeq	6-10		none				
1138	Ridge Avenue, Lagoon City	Lake Avenue	0.2 km West	0.20	S	LCB	2	LR	5	62	adeq	NOW	adeq	1-5	YES	RW	NOW	$23,264	25	1
1140	Ridge Avenue, Lagoon City	0.2 km East of Lake Avenue	0.3 km East of Lake Avenue	0.10	S	HCB	2	LR	5	80	adeq	adeq	adeq	adeq		none				
1142	Ridge Avenue, Lagoon City	Plum Point Road	East End	0.60	S	GS	2	LR	5	57	NOW	NOW	adeq	1-5	YES	RW	NOW	$89,152	28	1
3114	River Road	Highway 169	Poplar Lane	1.00	S	HCB	2	LR	5	82	adeq	adeq	adeq	6.10		none				
4178	Riverleigh Drive, Washago	Bayshore Drive	Bayshore Drive	0.40	S	HCB	2	LR	5	92	adeq	adeq	adeq	6.10		R1	6.10	$47,927	5	0
3030	Sandlewood Trail, Bayshore V	Southwood Beach Road	South End	0.20	R	GS	2	100	6	56	adeq	NOW	adeq	adeq	maintain	none				
4132	Shadycourt Road	Airport Road	Bluebird Street	0.50	R	GS	2	200	5	76	adeq	adeq	adeq	6.10		none				
4110	Sheba Drive	Highway 169	Concession Road 7	0.70	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
2096	Sideroad 10	Concession Road 7	Highway 169	0.80	R	GS	2	100	6	70	adeq	NOW	adeq	6.10	maintain	none				
2098	Sideroad 10	Highway 169	Mara-Rama Townline	2.90	R	ETH	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
2100	Sideroad 10	Highway 169	North End	1.10	R	GS	2	100	6	64	adeq	NOW	adeq	6.10	maintain	none				
4036	Sideroad 10/11	Donald Carrick Lane	South End	0.10	S	GS	2	LR	6	65	NOW	NOW	adeq	adeq	YES	RW	NOW	$11,632	18	0
1014	Sideroad 15	Furniss Crescent	Concession Road B	0.40	R	GS	2	300	4	83	adeq	adeq	adeq	adeq		none				
1016	Sideroad 15	Furniss Crescent	Concession Road A	1.40	S	GS	2	CR	4	76	NOW	adeq	adeq	adeq	YES	R1	NOW	$157,118	17	1
1032	Sideroad 15	Concession Road B	South End	0.50	R	ETH	1	100	6	49	adeq	NOW	adeq	adeq	maintain	none				
2078	Sideroad 15	Concession Road 7	Concession Road 8	1.40	R	GS	2	200	4	63	adeq	NOW	adeq	6-10	YES	W	NOW	$169,676	24	1
2080	Sideroad 15	Concession Road 8	Concession Road 9	1.30	R	GS	2	200	4	64	adeq	NOW	adeq	6-10	YES	W	NOW	$163,103	25	2
2082	Sideroad 15	Concession Road 9	Highway 12	0.50	R	GS	2	200	4	80	adeq	adeq	adeq	6-10		none				
2084	Sideroad 15	Highway 12	Concession Road 10	0.90	R	GS	2	200	4	86	adeq	adeq	adeq	6.10		none				
2086	Sideroad 15	Concession Road 10	Ramara Road 46	1.40	R	GS	2	200	4	79	adeq	adeq	adeq	6.10		none				
2088	Sideroad 15	County Road 46	Concession Road 12	1.50	R	GS	2	200	4	85	adeq	adeq	adeq	6.10		none				

ROAD INVENTORY SECTIONS

Section No.	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class MTO	Existing Class O.Reg 239/02	Condition Rating	Need for Improvement: Surface Type	Need for Improvement: Surface Width	Need for Improvement: Road Structure	Need for Improvement: Drainage	Need for Improvement: Improve vs Maintenance	Recommended Improvement: Type of Improvement	Recommended Improvement: Time of Need	Recommended Improvement: Total Cost	Ratings: Priority Rating	Ratings: Priority Guide Number
2092	Sideroad 15	Concession Road 12	Concession Road 13	1.30	R	GS	2	200	4	76	adeq	adeq	adeq	1-5		none				
2094	Sideroad 15	Concession Road 13	Monck Road	1.40	R	GS	2	200	4	78	adeq	adeq	adeq	6-10		none				
4078	Sideroad 17/18	3rd Line	North End	0.90	R	GS	1	100	6	64	adeq	NOW	adeq	6-10	maintain	none				
3288	Sideroad 18	Monck Road	Old Boundry Road	0.20	R	GS	2	100	6	68	adeq	NOW	adeq	6-10	maintain	none				
3042	Sideroad 20	Glenrest Drive	Concession Road 7	0.50	R	HCB	2	500	3	84	adeq	adeq	adeq	adeq		none				
3044	Sideroad 20	Concession Road 7	Concession Road 8	1.70	R	HCB	2	500	3	77	adeq	adeq	6-10	6-10	YES	PR1	1-5	$362,049	27	5
3076	Sideroad 20	Highway 12	Concession Road 9	1.80	R	GS	2	200	4	68	adeq	NOW	adeq	6-10	YES	W	NOW	$273,196	29	1
3078	Sideroad 20	Concession Road 9	South End	0.50	R	GS	2	100	6	67	adeq	NOW	adeq	6-10	maintain	none				
3276	Sideroad 20	Highway 12	Concession Road 11	0.90	R	GS	2	200	4	58	adeq	NOW	adeq	6-10	YES	W	NOW	$96,228	28	3
3278	Sideroad 20	Concession Road 11	County Road 45 (Monck Road)	3.30	R	GS	2	200	4	49	adeq	NOW	adeq	adeq	YES	BS	NOW	$500,803	35	1
3050	Sideroad 25	Muley Point Road	Bonnie Beach Road	0.50	R	GS	1	100	6	34	adeq	NOW	NOW	adeq	maintain	none				
3268	Sideroad 25	Highway 12	Concession Road 11	0.70	R	GS	2	300	4	82	adeq	adeq	adeq	6-10		none				
3270	Sideroad 25	Concession Road 11	Concession Road 12	1.40	R	GS	2	200	4	78	adeq	adeq	adeq	6-10		none				
3272	Sideroad 25	Concession Road 12	County Road 45	1.40	R	GS	2	200	4	75	adeq	adeq	adeq	6-10		none				
3274	Sideroad 25	County Road 45	Mara-Rama Townline Road	1.40	R	GS	2	200	4	66	adeq	adeq	adeq	1-5		none				
3140	Sideroad 27	Concession Road 10	North End	0.10	S	GS	2	LR	6	54	NOW	NOW	adeq	adeq	YES	RW	NOW	$16,739	24	0
3152	Sideroad 30	Anderson Avenue	Concession Road 10	0.20	R	LCB	2	300	5	80	adeq	adeq	6-10	6-10	YES	PR1	1-5	$33,067	17	1
3154	Sideroad 30	Concession Road 10	0.5 km North	0.50	R	LCB	2	500	4	81	adeq	adeq	6-10	adeq	YES	PR1	1-5	$84,861	23	6
3156	Sideroad 30	0.5 km North of Conc Road 10	Concession Road 11	1.00	R	HCB	2	500	4	62	adeq	adeq	6-10	6-10	YES	PR1	1-5	$164,730	45	11
1182	Sideroad 5	Canal Road	Concession Road 1	1.40	R	GS	2	200	4	78	adeq	adeq	adeq	6-10		none				
1184	Sideroad 5	Concession Road 1	Concession Road 2	1.30	R	GS	2	200	4	84	adeq	adeq	adeq	adeq		none				
1186	Sideroad 5	Concession Road 2	Concession Road 3	1.40	R	GS	2	200	4	83	adeq	adeq	adeq	adeq		none				
1188	Sideroad 5	Concession Road 3	Ramara Road 47	1.40	R	GS	2	200	4	79	adeq	adeq	adeq	6-10		none				
1190	Sideroad 5	County Road 47	Concession Road 5	1.40	R	GS	2	200	4	69	adeq	adeq	adeq	6-10		none				
2102	Sideroad 5	Concession Road 10	County Road 46	1.40	R	GS	2	200	4	72	adeq	adeq	adeq	1-5		none				
2104	Sideroad 5	County Road 46	Concession Road 13	2.70	R	GS	2	200	4	65	adeq	adeq	adeq	NOW		none				
4028	Sideroad 5/6	Concession Road B/C	1.1 km North	1.10	R	GS	2	100	6	52	adeq	NOW	adeq	adeq	maintain	none				
4030	Sideroad 5/6	1.1 km North of Conc Road B/C	Concession Road D/E	1.00	R	GS	1	100	6	40	adeq	NOW	NOW	adeq	maintain	none				
4068	Sideroad 5/6	Concession Road M/N	Muskoka Road 6	0.80	R	GS	1	100	6	19	adeq	NOW	NOW	adeq	maintain	none				
1124	Simcoe Road	Ramara Road 47	West End	1.50	S	HCB	2	LR	4	63	adeq	adeq	NOW	adeq	YES	BS	NOW	$361,557	56	29
4158	Singing Pines Road, Washago	Highway 169	County Road 44	0.40	S	GS	2	LR	6	66	NOW	NOW	adeq	1-5	YES	RW	NOW	$69,999	19	0
4072	Smith Sideroad	Monck Road	2nd Line	1.40	R	GS	2	100	6	65	adeq	NOW	adeq	6-10	maintain	none				
4154	Somerset Drive	County Road 44	West End	0.20	R	GS	2	100	6	69	adeq	adeq	adeq	1-5	maintain	none				
1168	South Island Trail,Lagoon City	Laguna Parkway	West End	0.40	S	HCB	2	LR	5	91	adeq	adeq	adeq	adeq		none				
4162	South River Road, Washago	Highway 169	South End	0.70	S	LCB	2	LR	5	70	adeq	adeq	adeq	1-5		none				
3016	Southview Drive, Bayshore V	Sideroad 20	West End	0.90	S	HCB	2	LR	5	87	adeq	adeq	adeq	6-10		R1	6-10	$112,106	10	1
4130	Southwood Beach Road	County Road 44	East End	1.20	S	GS	2	LR	5	54	NOW	NOW	adeq	adeq	YES	RW	NOW	$174,478	32	1
1018	Spy Glass Point Road	Concession Road B	South End	0.40	S	HCB	2	LR	6	92	adeq	adeq	adeq	adeq		none				
2038	Stephanie Drive	Concession Road 9	Carol Ann Avenue	0.40	R	GS	2	200	4	68	adeq	NOW	adeq	6-10	YES	W	NOW	$52,286	22	5
1006	Stephen Drive	County Road 47	0.4 km West	0.40	S	HCB	2	LR	5	87	adeq	adeq	adeq	adeq		none				
1008	Stephen Drive	0.4 km West of County Road 47	Stephen Drive	0.30	S	HCB	2	LR	5	90	adeq	adeq	adeq	adeq		none				
3160	Stephen Street	McNeil Street	Daniel Street	0.20	S	LCB	2	LR	5	77	adeq	adeq	adeq	adeq		none				
1004	Stone Gate Road	County Road 47	West End	0.30	S	GS	2	LR	5	62	NOW	NOW	adeq	1-5	YES	RW	NOW	$45,651	25	1
1038	Sunnydale Lane	Syntrac Drive	East End	0.15	S	HCB	2	LR	6	100	adeq	adeq	adeq	adeq		none				
2020	Sunrise Drive	Sylvan Glen Drive	East End	0.30	S	GS	2	LR	5	68	NOW	NOW	adeq	6-10	YES	RW	NOW	$15,651	21	1
1034	Syntrac Drive	Sideroad 15	Sideroad 15	1.20	S	HCB	2	LR	5	90	adeq	adeq	adeq	adeq		none				
4082	Switch Road	Highway 169	Davy Drive	1.90	R	HCB	2	300	4	90	adeq	adeq	adeq	6-10		none				
4084	Switch Road	Davy Drive	0.6 km West	0.35	R	HCB	2	300	5	90	adeq	adeq	adeq	6-10		none				
4086A	Switch Road	0.4km East of County Road 44	County Road 44	0.40	R	HCB	2	300	4	63	adeq	adeq	adeq	adeq		none				
4086B	Switch Road	0.6 km West of Davy Drive	0.4km East of County Road 44	1.40	R	LCB	2	300	4	69	adeq	adeq	adeq	adeq		none				
2022	Sylvan Glen Drive	Mara Carden Townline Road	West End	0.70	S	GS	2	LR	5	61	NOW	NOW	adeq	1-5	YES	RW	NOW	$100,608	30	2
1144	The Ship Avenue, Lagoon City	Lake Avenue	Ridge Avenue	0.20	S	HCB	2	LR	5	70	adeq	NOW	adeq	6-10	YES	RW	NOW	$30,434	18	0
3028	Thicketwood Pl, Bayshore V	Bayshore Drive	West End	0.70	S	HCB	2	LR	5	91	adeq	adeq	adeq	6-10		R1	6-10	$87,194	7	1
3192	Tynon Lane, Atherley	Winchester Road	North End	0.20	S	HCB	1	LR	5	43	adeq	NOW	NOW	adeq	YES	REC	NOW	$74,126	39	7
3058	Tuppy Drive	Edgehill Road	South End	0.15	S	HCB	2	LR	5	76	adeq	adeq	adeq	adeq		none				
1156	Turtle Path, Lagoon City	Poplar Crescent	0.3 km South	0.30	S	HCB	2	LR	5	78	adeq	adeq	1-5	6-10	YES	BS	1-5	$72,311	16	4
1158	Turtle Path, Lagoon City	0.3 km South of Poplar Crescent	Poplar Crescent	0.00	S	HCB	2	LR	5	79	adeq	adeq	1-5	6-10	YES	BS	1-5	$216,931	16	2
1116	Un Named Street	Lakeshore Drive	West End	0.10	R	GS	1	100	6	52	adeq	NOW	adeq	adeq	maintain	none				

ROAD INVENTORY SECTIONS

Section No.	Road Name	From	To	Length (km)	Roadside Env.	Surface Type	Number of Lanes	Existing Class		Condition Rating	Need for Improvement					Recommended Improvement			Ratings	
								MTO	O.Reg 239/02		Surface Type	Surface Width	Road Structure	Drainage	Improve vs Maintenance	Type of Improvement	Time of Need	Total Cost	Priority Rating	Priority Guide Number
4096	Victoria Park Road	Williams Road	Burnside Road	0.50	S	GS	2	LR	5	54	NOW	NOW	adeq	adeq	YES	RW	NOW	$67,122	28	1
4016	Warren Road	Lakefront Drive	East End	0.20	S	GS	2	LR	5	70	NOW	adeq	adeq	adeq	YES	R1	NOW	$22,445	13	0
3174	Wellington Street, Atherley	Paget Street	William Street	0.40	S	HCB	2	LR	5	80	adeq	adeq	adeq	adeq		none				
4176	West River Road, Washago	Highway 169	North End	0.40	S	GS	2	LR	5	78	NOW	adeq	adeq	6-10	YES	R1	NOW	$45,340	16	1
4172	Whelan Way, Washago	East River Road	West End	0.20	S	GS	2	LR	6	67	NOW	NOW	adeq	1-5	YES	RW	NOW	$28,402	18	0
3132	William Street	Fountain Drive	North End	0.15	S	HCB	2	LR	6	91	adeq	adeq	adeq	6-10		none				
3206	William Street, Atherley	Patricia Drive	Wellington Street	0.15	S	HCB	2	LR	5	80	adeq	adeq	adeq	adeq		none				
4089	Wilson Sideroad	Mara-Rama Townline Road	0.8 km North	0.80	R	GS	2	200	4	80	adeq	adeq	adeq	1-5		none				
1154	Willow Court, Lagoon City	Poplar Crescent	South End	0.30	S	HCB	2	LR	5	93	adeq	adeq	adeq	6-10		none				
3212	Winchester Street, Atherley	Creighton Street	Tivnon Lane	0.10	S	LCB	2	LR	6	65	adeq	NOW	adeq	1-5	YES	RW	NOW	$12,349	19	0
3214	Winchester Street, Atherley	Creighton Street	Patricia Drive	0.10	S	HCB	2	LR	5	60	adeq	NOW	adeq	adeq	YES	RW	NOW	$15,217	25	1
3106	Woodland Drive	McRae Park	South End	0.20	S	GS	2	LR	5	64	NOW	NOW	adeq	6-10	YES	RW	NOW	$29,000	26	1