THE CORPORATION OF THE
TOWNSHIP OF RAMARA

BRECHIN SANITARY SERVICING
PRELIMINARY REPORT

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1 INTRODUCTION

1.1 General

The Township of Ramara, County of Simcoe borders the east shore of Lake Simcoe and Lake Couchiching. It operates the infrastructure for the community of Lagoon City, which was assumed by the Township of Ramara (then Mara) in 1992. Adjacent to Lagoon City are the small unsewered lakeshore communities of Brechin Beach, Brechin Point and Concord Point, and the Hamlet of Brechin. The Township of Ramara is considering extending the Lagoon City sanitary service area into these adjacent communities in order to resolve health and environmental problems associated with inadequate private sewage disposal systems and to provide the opportunity for development in Brechin.

1.2 Scope

This report, as proposed by C.C. Tatham & Associates Ltd. (CCTA) in a February 2, 1998 letter to the Township of Ramara, summarizes the results of the 1998 survey of the Hamlet of Brechin and the adjacent lakeshore areas. A recommendation is made regarding an application for provincial funding.

In addition, this report describes the current available system capacity and makes recommendations regarding an ultimate sanitary service area.

Project cost estimates are submitted in a separate cost report.

1.3 Objectives

The following objectives were to be met in conducting the study and preparing this report:

- Obtain the supporting information on the condition of the private sewage systems in Brechin to develop a successful application for funding, under the Provincial Water Protection Fund, to convert private sewage systems to a municipal system.

- Make a recommendation on the viability of an application for provincials funding based on the results of the survey, background information and historical records.

- Present an overview of a sanitary servicing solution for Brechin and lakeshore areas.

2 GENERAL CONDITIONS IN THE BRECHIN AND LAKESHORE AREAS

2.1 Brechin

The Hamlet of Brechin is located at the crossroads of Highway 12 and County Rd. 47. It has an approximate population of 350.

2.1.1 Soils and Groundwater

The soils in Brechin are typically low permeability silty clays underlain by sandy silt or sandy clay (Geo-Canada, 1991). Their impermeability causes poor or imperfect drainage.

Bedrock is found at shallow depths, 1.2 m, at the southern limits of the Hamlet and deeper at County Rd. 47, approximately 3.6 m below the surface.

Groundwater can be found at approximately 1.3 m below the surface, but ranges to greater than 2.1 m, depending on location.

2.1.2 Water Supply

All properties in Brechin are served by a municipal water supply. Lake Simcoe water, treated at the Lagoon City Water Treatment Plant, is pumped to a standpipe in Brechin. The system has been in place since the early 1970s.

2.1.3 Sewage Disposal

Sewage disposal in Brechin consists of individual septic systems and a few holding tanks. Since at least 1968, Brechin residents have been concerned that wells used for domestic consumption were contaminated by inadequate or malfunctioning septic systems. Although the pollution source was never confirmed, the District Health Unit confirmed in a 1972 survey of wells that a high percentage of wells were polluted. Replacing the individual sewage disposal units with a municipal sewer system has been discussed since the municipal water supply was constructed. A 1969 report by Totten, Sims, Hubicki & Associates Limited predicted that the installation of the municipal water supply would place a considerable load on the existing septic systems, resulting in increased ponding problems at the tile fields.

2.2 Lakeshore Area

The lakeshore area, as referred to in this report, consists of Concord Point, Brechin Point and Brechin Beach, located in Concessions 3 and 4, directly south of Lagoon City. The total population of these areas is estimated at 450 during the summer.

2.2.1 Soils and Groundwater

Soils in the lakeshore area are similar to the soils found in Lagoon City. Lake Simcoe lakeshore contains peat soils and soft, highly organic clays. The area is poorly drained and swampy (Dominion Soil Investigation, 1973, 1982).

Ground elevations are typically only a few feet above lake level and thus the groundwater is close to the surface.

2.2.2 Water Supply

Concord Point and Brechin Point, the areas closest to Lagoon City, are connected to the municipal water supply system. Residents of Brechin Beach rely on private systems, including dug and drilled wells, or water pumped directly from Lake Simcoe.

2.2.3 Sewage Disposal

The lakeshore area is not sewered. Properties rely on septic tanks and tile beds, holding tanks, and other systems.

3 SEWAGE SYSTEM SURVEY

3.1 Survey Approach

An Open House was held on June 5, 1998 to inform the public of the upcoming survey. An information sheet, explaining why a survey was required and describing what it would consist of, was distributed to all attendants. During this meeting, staff from CCTA and from the Township answered questions regarding the survey and the possible sanitary servicing project. The prospect of sewering Brechin and the lakeshore was well received by all attendants. The information sheet, a summary of the Open House, the list of attendants and information requests and comments received since the Open House, are included in Appendix A.

The sanitary survey was initiated on June 9, 1998. During the first day of the survey, which consisted of 40 inspections on Ridge Avenue and Lone Birch Trail, no problems were observed. It was predicted that few problems would be visible in the remainder of the lakeshore lots because of the limited use the cottages had had to that time and because of the very dry weather conditions. The survey was therefore put on hold until more rainfall occurred and occupancy levels increased.

The survey was resumed in late June. Expected problem areas in Brechin, identified by Township staff, were inspected and surface water samples were taken immediately after a rainfall of significant duration (June 29). In addition, inlets to storm sewers and ditches were sampled after a rain event on July 9 and, for comparison, after an extended dry weather period on July 21. Samples were sent to the Central Ontario Analytical Laboratory in Orillia and analyzed for coliforms.

During the month of July, the survey team conducted a lot-by-lot inspection in Brechin and the lakeshore. In general terms, the lot-by-lot survey consisted of completing a Site Inspection Report (shown in Appendix A in the information package), and checking for ponding, breakout of sewage and discharges off property, as well as for greywater ponding and discharges. If available, the occupants were interviewed to assist in identifying problems that may not be occurring at the time of the survey. The survey team also estimated if there was sufficient space available on each lot to install a replacement tile bed according to current standards and setbacks. For this purpose, the tile bed area was calculated on the basis of the smallest sized raised tile bed available, referred to as a Class 4F or filter bed.

The areas surveyed in the Hamlet of Brechin and in the lakeshore area are shown on Figure 3.1.

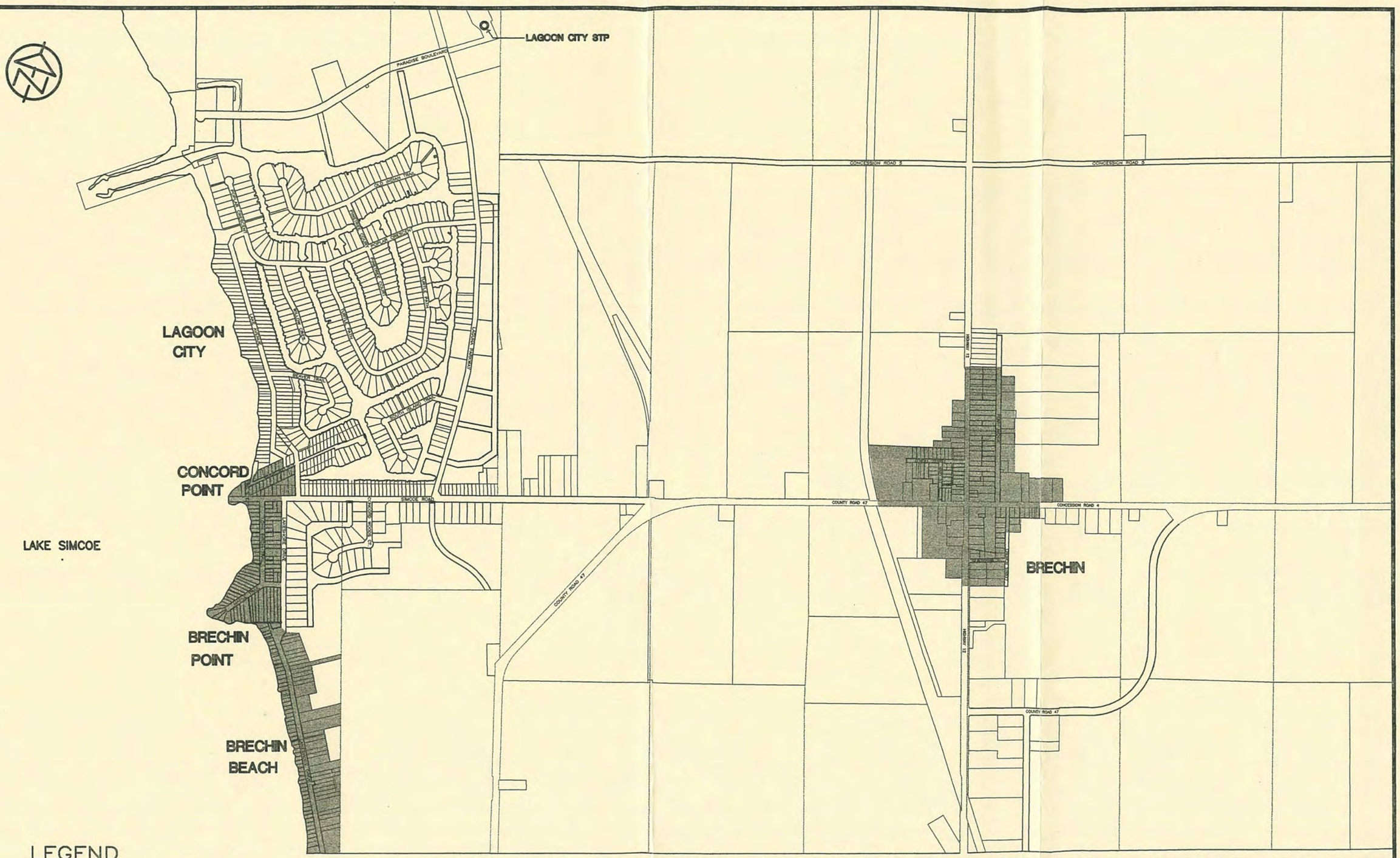
3.2 Survey Results

3.2.1 Lakeshore

In the lakeshore area, 75% of all lots were inspected; specifically, 150 out of an estimated 201 lots (vacant and built). They are located on Ridge Ave., Simcoe Rd., Lone Birch Trail, Maple Trail and Lakeshore Dr. to Concession 3, as shown on Figure 3.1. The results of the survey are summarized in Table 3.1.

Out of the 150 lots surveyed, it was estimated that 88% of the residential properties are used seasonally. A third of the lots surveyed use a holding tank to dispose of their sewage. There were few problems visible to the inspectors, other than minor deficiencies. It should be noted that a malfunctioning septic system or holding tank might not be evident at the ground surface. For example, old tanks could easily be leaking and sewage rapidly infiltrating into the groundwater and/or lake.

It was estimated that 99% of the existing septic systems are undersized, based on current standards and none of them meet the required setbacks. Only 8% of the properties in the lakeshore area are of sufficient dimensions to install an adequately sized septic system (Type 4F, raised), meeting current sizing standards and setbacks.



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BRECHIN SANITARY SERVICING
LIMITS OF SANITARY SURVEY

DWG. No. **FIG. 3.1**

SCALE: NTS | DATE: OCTOBER 1998 | JOB NO. 98021

Table 3.1
Lakeshore Area Survey Result Summary

Characteristic	***Result***
Type of Establishment	
Residential	98.7%
Residential – Permanent	12% of residences
Residential – Seasonal	88% of residences
Commercial	1.3%
Water Supply	
Municipal	59%
Other (lake, well, etc.)	41%
Type of Sewage Disposal System	
Septic System	63%
Holding Tank	32%
Other (pit privy, chemical toilet, etc.)	2%
Unknown	3%
Problems Observed During Survey	
Ponding	0
Discharge off property	0
Other (leaking tank, greywater discharge, missing tank lid)	3
Sizing of Existing Septic System	
Undersized Tile Field	99%
Adequate Tile Field	1%
Setbacks of Existing Septic System	
Insufficient setbacks	100%
Sufficient setbacks	0%
Area for Replacement Septic System (Current Standards)	
Area not available	92%
Area available	8%
Setbacks for Replacement Septic System (Current Standards)	
Setbacks cannot be met	93%
Setbacks can be met	7%

3.2.2 Brechin

In Brechin, 111 lots were inspected out of a total of 128 vacant and built lots within the limits of the Hamlet. The survey therefore covered 87% of the community and 100% of what the Township staff considered the problem area. A summary of the survey results for Brechin is presented in Table 3.2.

Table 3.2
Brechin Survey Result Summary

Characteristic	***Result (% of inspected lots)***
Type of Establishment	
Residential – Permanent	76%
Commercial	21%
Institutional	3%
Type of Sewage Disposal System	
Septic System	94%
Holding Tank	3%
Unknown	3%
Direct Evidence of Problems Observed During Survey	
Sewage ponding (contamination confirmed)	12%
Discharge off property	0%
Other (direct discharges on property, contaminated sump pump discharges, etc.) (contamination confirmed)	5%
Sizing of Existing Septic System	
Undersized Tile Field	99%
Adequate Tile Field	1%
Setbacks of Existing Septic System	
Insufficient setbacks	100%
Sufficient setbacks	0%
Area for Replacement Septic System (Current Standards)	
Area not available	49.5%
Area available	50.5%
Setbacks for Replacement Septic System (Current Standards)	
Setbacks cannot be met	49.5%
Setbacks can be met	50.5%

During the survey, major problems with the sewage disposal systems were observed on 18 lots or 17% of the lots surveyed. Problems were typically visible only after a rainfall event. Sewage could be found ponding at the surface of or near the tile bed or septic tank. Samples taken on the properties confirmed that the ponding water was contaminated with sewage. At other locations, highly contaminated sump pump discharges onto the ground were found.

It appears that the poor performance of Brechin's sewage systems could be more prevalent than the lot-by-lot inspection revealed. Sampling of surface water entering the storm sewer system on the main roads in Brechin (see Figure 3.2), conducted after a rain event and after a dry period indicates that the storm sewers receive raw sewage. Table 3.3 shows that highly elevated counts of both E. Coli and Total Coliforms were measured in all samples taken in the catch basins along Highway 12, County Rd. 47 and Concession Rd. 4. Some samples contained coliform levels typical of undiluted raw sewage. This contamination of the stormwater is believed to originate from illegal connections of septic tank discharges, and contaminated discharges from sump pumps and foundation drains. Some of the connections were visible at the catch basins. Other indicators of illegal connections included large amounts of soapsuds in some catch basins. The drainage of sewage through the storm sewer system could also explain the lack of septic system break-outs, even though most of the septic systems are undersized, old and built on impermeable soils.

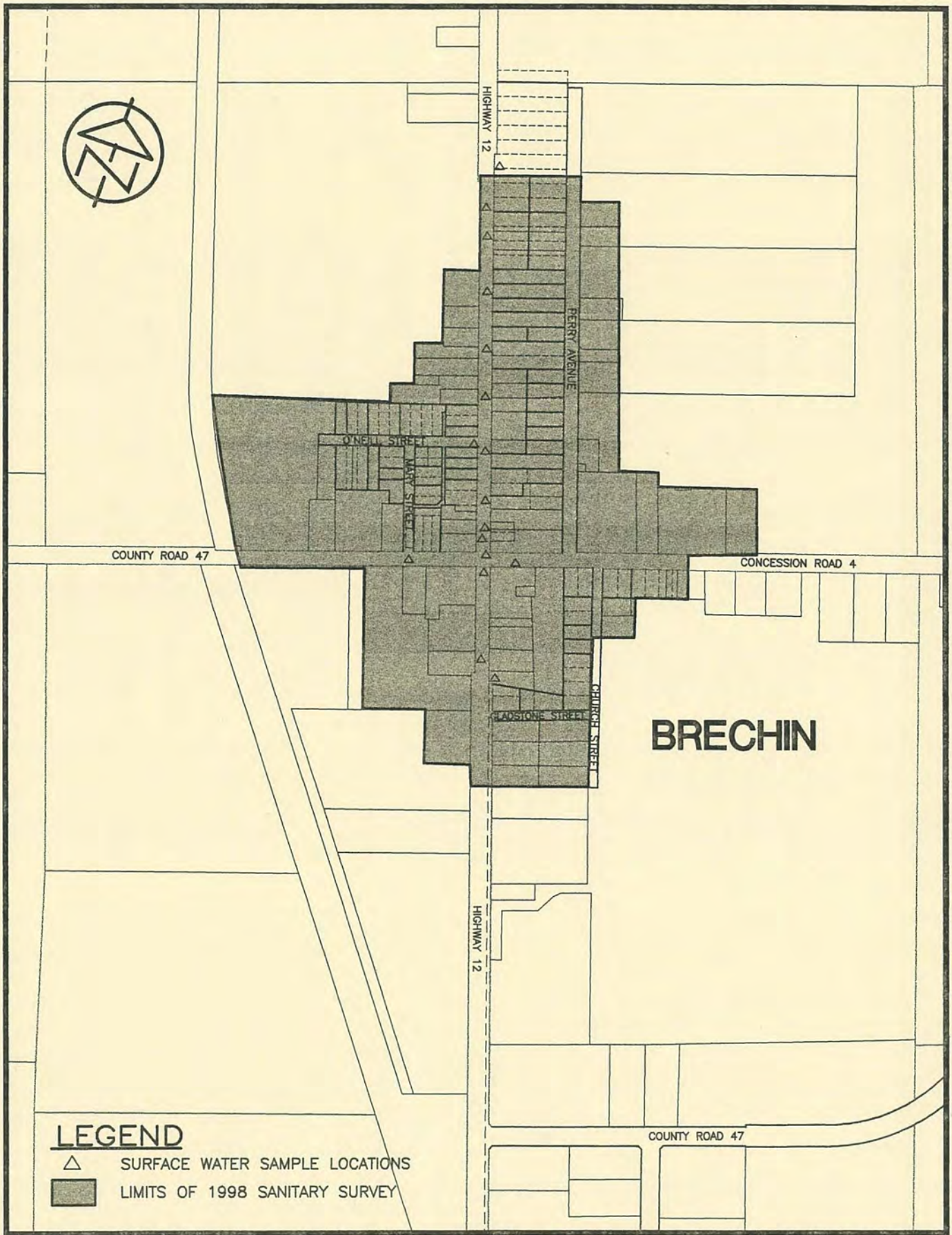
Approximately half of the lots inspected in Brechin are too small to contain an adequately sized replacement septic tile field (Type 4F, raised) and to meet the required setbacks.

3.3 Survey Conclusions

On the basis of the results of the 1998 survey of the lakeshore area and Brechin, it was concluded that:

Lakeshore

- Although problems with the sewage disposal systems in the lakeshore area are not readily evident, conditions are not favorable for the use of in-ground individual sewage systems. Specifically, the high groundwater levels, proximity to Lake Simcoe and poor soils require large raised tile beds with a significant mantle area and setbacks. Only 8% of the 150 lots surveyed met the minimum requirements for a tile bed, and none of the properties have sufficient area to install a backup bed if the first failed. Holding tanks are not considered a viable, long-term solution because of the difficulty in identifying deficiencies and preventing pollution of the groundwater and, in this location, pollution of Lake Simcoe. Further, as 59% of the lots surveyed already make use of the municipal water supply system, the hydraulic loading on the existing on-site sewage systems is expected to be higher than they were designed to accommodate.



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SAMPLING LOCATIONS

DWG. No. **FIG. 3.2**

SCALE: NTS | DATE: OCT 1998 | JOB NO. 98021

Table 3.3
Indirect Evidence of Problems with Sewage Disposal Systems in Brechin
Sampling in Storm Sewer Catchbasins and Manholes

Location	Sample No.	Results (Count per 100 ml)					
		June 29, 1998[1]		July 9, 1998[1]		July 21, 1998[2]	
		TC[3]	EC[4]	TC[3]	EC[4]	TC[3]	EC[4]
Hwy 12 between Concession Rd. 4 and northern limit of Brechin							
NE corner of Hwy. 12 and Conc. 4	1039					3,000	200
East side, near lot 2-234	1034					1,100,000	780,000
West side, in Bell access chamber	1018	5,200	456				
East side, near lot 2-231	1035					1,300,000	420,000
East side, in Post Office storm drain	1031			3,600	900		
East side, near lot 2-226	1024/ 1036			1,400,000	210,000	1,200,000	400,000
SW corner of Hwy 12 & O'Neill St.	1019	1,600	700				
East side, near lot 2-222	1023/1037			1,900,000	160,000	20,000,000	950,000
East side, near lot 2-220	1025			2,100,000	1,100,000		
East side, near lot 2-216	1026			1,900,000	80,000		
East side, near lot 2-21402	1027			130,000	70,000		
East side, near lot 2-213	1028			140,000	60,000		
East side, at ditch near lot 2-213	1021/1040			800	168	6,000	200
Hwy 12 between Concession Rd. 4 and Gladstone St.							
SE corner of Hwy. 12 and Conc. 4	1038					380,000	300
East side, near lot 2-104	1033					1,000,000	2,000
Concession Rd. 4 East of Hwy. 12							
South side, near lot 2-101	1004	420,000	7,600				
County Rd. 47 West of Hwy. 12							
SE corner of Mary & County Rd. 47	1032					5,500,000	1,000

Notes:
1. June 29 and July 9 sampling was conducted immediately after a significant rainfall
2. July 21 sampling was conducted in a dry period with no precipitation for at least 10 days
3. TC: Total Coliforms
4. EC: E. Coli only

- Replacement of the existing on-site sewage disposal systems with a communal sewer system appears to be the most viable solution to eliminate the potential contamination of Lake Simcoe, a recreational water body used for water supply by some cottagers.

- In terms of eligibility for funding under the Provincial Water Protection Fund, the project would not meet the residency criteria which states that at least 50% of the properties must be occupied for at least 9 months of the year.

Brechin

- Significant problems with the existing on-site sewage disposal systems in Brechin were confirmed during the survey. There appears to be at least 18 lots where the septic systems are not functional. There is also evidence of sewage contamination into the storm sewer systems, which discharge to surface water ditches that drain to Lake Simcoe. This contamination is believed to originate from a number of illegal connections and from drains contaminated by failed septic systems. The individual sources of sewage contamination could not be identified within the scope of this survey. This effort would be extensive and may not be fully conclusive.

- Replacement of the known malfunctioning septic systems with adequately sized septic systems is only possible at 44% of these locations. On the whole, only half of the lots in Brechin can accommodate a tile bed that meets current standards and setbacks. Consequently, the preferred approach to eliminate the environmental and health problems, is to sewer the Brechin area.

- In view of the significant number of known problems with the septic systems and of the evidence of sewage contamination gathered to date, a sanitary servicing project for the Hamlet of Brechin should be eligible for funding by the Provincial Water Protection Fund. A detailed and highly documented application for funding will be necessary to demonstrate the existing and potential environmental and health impacts of pollution in Brechin and the benefits of a sewage collection system and connection to an existing underutilized treatment facility.

4 SERVICING BRECHIN AND ADJACENT AREAS

4.1 Delineation of the Potential Service Area

The potential sanitary sewer service area that could be serviced by a sewage collection system to the Lagoon City STP is shown on Figure 4.1. It includes existing developed lands and lands designated for development in the Official Plan.

LAGOON CITY STP

LAGOON CITY

CONCORD POINT

LAKE SIMCOE

BRECHIN POINT

BRECHIN BEACH

BRECHIN

PARADISE BOULEVARD

CONCESSION ROAD 5

SIMCOE ROAD

COUNTY ROAD 47

CONCESSION ROAD 4

HIGHWAY 12

LEGEND

LIMITS OF THE POTENTIAL SERVICE AREA TO LAGOON CITY STP

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POTENTIAL SERVICE AREA

DWG. No. FIG. 4.1

SCALE: NTS | DATE: OCTOBER 1998 | JOB NO. 98021

The service area's ultimate population and system capacity requirements are estimated in Table 4.1. The following assumptions were made:

- In Brechin, all areas currently undeveloped but designated Village Residential were included in the potential service area. As per Ramara's Official Plan Consolidated (August 31, 1996), a maximum residential density of 3 to 5 dwelling units per 4050 m^2 of gross area (equivalent to 3 to 5 units/acre) is allowed in these areas when sewers are available. The ultimate population shown in Table 4.1 was calculated with a maximum density of 4 units per acre (or 9.88 units/ha).

- The Brechin Public School water consumption is 16 L/student/day. This consumption rate is less than their expected water usage of 30 L/student/day. For planning purposes, a sewage generation rate of 30 L/student/day at the school's rating of 315 students was used to calculate the maximum sewage flow from the school.

- The Brechin industrial park is partially developed using on-site sewage disposal systems. It was assumed that the low sewage generation rate allowed for these existing lots would not change if sewers were installed. However, the currently vacant industrial lots could develop with a higher, more typical sewage generation rate for light industry with little or no wet processes. An average rate of 10 m^3/ha/day was used in the estimate. Overall, the industrial park could produce sewage at a rate equivalent to a population of 596.

- The area between the Hamlet of Brechin and Lagoon City, along County Rd. 47 and Simcoe Rd., is designated Agricultural. It therefore was not included in the potential service area.

- The potential service area includes the areas zoned Lakeshore Residential on Simcoe Rd. and along the lakeshore to Concession 3, although the Official Plan states that, under this designation, effluent disposal shall consist of individual sewage systems. This area was included for consideration because of the potential health and environmental impacts from on-site private sewage systems.

- A per capita sewage generation rate for the lakeshore area, referred to as Concord Point, Brechin Point and Brechin Beach in Table 4.1, of 180 L/cap/day was used in the estimate. This value assumes that the area would be serviced with a pressure sewer system, which has a lower design flow than a conventional gravity sewer system. The installation of a pressure sewer system is anticipated because of the soil and groundwater conditions in this area.

Table 4.1
Ultimate Population and System Capacity Requirement of the Potential Sewer Service Area

Component	*Existing Lots*	*Designated Development Areas*			*Population*		*Capacity Requirement*	
		Gross Area (ha)	*Density (units/ha)*	*Number of Units*	*Persons/lot*	*Equivalent Population*	*Unit Rate (m^3/cap/d)*	*(m^3/d)*
Hamlet of Brechin								
Existing	128				3.5	448	0.4545	204
Public School					315	21	0.0300	9
Veltri		27	9.88	267	3.5	934	0.4545	424
Perry Ave. Lot 2-20330		4.87	9.88	48	3.5	168	0.4545	77
Perry Ave. Lot 2-20320		3.85	9.88	38	3.5	133	0.4545	61
Perry Ave. Lot 2-20310		3.84	9.88	38	3.5	133	0.4545	60
Perry Ave. Lot 2-20301		3.48	9.88	34	3.5	120	0.4545	55
Perry Ave. Lot 2-20200		11.41	9.88	113	3.5	395	0.4545	179
Hwy 12 Lot 9-46600		14.46	9.88	143	3.5	500	0.4545	227
Industrial Park - Existing		15.8				64	1.85	29
Industrial Park - Vacant, Undeveloped		24.2				532	10.00	242
Total						3448		1567
County Road 47/Simcoe Road								
Simcoe Rd. Lot 9-20701		15.93	9.88	157	3.5	551	0.4545	250
Total						551		250
Lagoon City								
Existing and allocated								
Detached Residences	500				3.5	1750	0.35	613
Condominiums	503				2.5	1258	0.35	440
Marina slips	275				0.2	55	0.35	19
Concord Woods	48				3.5	168	0.35	59
Formerly Phases 3A and 3B		27	29.6	800	2.5	2001	0.35	700
Total						5231		1831
Concord Point, Brechin Point, Brechin Beach								
Existing	201				3.5	704	0.1818	128
TOTAL						9934		3777

- For Lagoon City, both the planned populations for Phases 1 and 2, and Phases 3A and 3B, are included in Table 4.1. The number of units and densities for Phases 1 and 2 were taken from the most up-to-date compilation of allocated capacity in Lagoon City included in the Township of Mara Report AD-18-93 approved by Council and accepted by the MOEE (Appendix B). Concord Woods is included in Phases 1 and 2.

  Because Lagoon City Phases 3A and 3B no longer have draft plan approval status, they are not considered to have a capacity allocation at the Lagoon City STP. However, they are included in the potential service area. The designation of the land allows a higher density than in Brechin. The planned average density for Phases 3A and 3B was 30 units/ha, with 2.5 persons/unit. This density was used in Table 4.1.

- A per capita sewage generation rate of 350 L/cap/day was assumed for Lagoon City based on: measured average sewage flows in the previous 3 years (1995 to 1997: 824 m^3/day), and using the most recent population census of 2,784 (1993) adjusted to account for occupancy. It was assumed that occupancy averages 85%.

Overall, the ultimate equivalent population of the potential service area is estimated at 9,934. It would require an average treatment capacity of 3,777 m^3/day.

4.2 Capacity of the Existing Lagoon City Sewage Treatment Plant

The Lagoon City Sewage Treatment Plant (STP) has an approved capacity of 2,273 m^3/day however it is currently built to a capacity of 1,714 m^3/day. A third clarifier remains to be constructed in order to achieve its approved capacity.

Part of the capacity of the Lagoon City STP is currently allocated to Lagoon City Phases 1 and 2, with a planned theoretical population of 3,231. Using a per capita sewage generation rate of 350 L/cap/day, this population translates to a committed capacity of 1,130 m^3/d.

On this basis, the residual capacity of the Lagoon City STP is 1,142 m^3/d (2,273 m^3/day – 1,130 m^3/day). This residual capacity is sufficient to accommodate an equivalent population of at least 2,513 (assuming a conservative sewage generation rate of 454 L/cap/day for new single family residential development outside Lagoon City).

In summary, the Lagoon City STP can service 3,231 people in Lagoon City Phases 1 and 2 at 350 L/cap/day, and an additional 2,513 people in the potential service area at 454 L/cap/day, for a total of 5,744.

To service the ultimate population of the entire potential service area would require an average day treatment capacity of 3,777 m^3/day. The Lagoon City STP would therefore need to be expanded by 66% or 1,504 m^3/day.

Table 4.2 summarizes the treatment capacity required for Lagoon City, Brechin, the lakeshore area and the development areas.

4.3 Planned System Improvements

A sewer rehabilitation program is currently underway in Lagoon City, with an objective of reducing the volume and rate of infiltration in the sewer system. Upon completion of this program, a 25% reduction in the peak sewage flow is anticipated (UMA, 1994). Subsequently, with continued frequent inspections of the sewer system and an ongoing maintenance program, the Lagoon City sewer system should meet typical allowances for extraneous flows that have been accounted for in the unit generation rates.

Concurrently, sewage treatment optimization measures are planned to start in 1998/99 to increase the operating efficiency of the STP. These measures will ensure that the capacity of the STP to treat a larger service area is not jeopardized and that the Lagoon City STP continues to perform well.

4.4 Servicing and Staging

Servicing Brechin and the lakeshore area to the Lagoon City STP will consist of the following components. Figure 4.2, at the back of the report, illustrates the servicing plan.

- In Brechin, a gravity sewer system serving every lot within the Hamlet's limit, and sized to accommodate all future potential developments, as per Table 4.1.

- A trunk sewer on County Rd. 47 will convey the sewage to a pumping station located at the western limit of Brechin, at the CNR railway, possibly at the community park. The Brechin pumping station will be sized for the ultimate sewage flows from Brechin.

- For the industrial park, a gravity sewer system will discharge to a lift station locating at the northern limit of the industrial park at Highway 12. This lift station will pump up to the Highway 12 sewer serving the southern portion of Brechin.

- A forcemain from Brechin to the Lagoon City sewer system, located on County Rd. 47/Simcoe Rd., is planned as a first stage. The forcemain will discharge at MH 102 of the Lagoon City system on Simcoe Road. The forcemain will be sized to the residual capacity of the Lagoon City gravity sewers between MH102 and the STP. It will have sufficient capacity to serve approximately 300 lots in Brechin.

- The first stage will also include the upgrade of pumping stations #3 and #5 on Laguna Parkway in Lagoon City, and the rerouting of PS#2 to PS#3 (Lagoon City's planned Stage 4).

Table 4.2
Summary of Treatment Capacity Requirements

Component	*Equivalent Population*	*Unit Generation Rate (m^3/cap/d)*	*Capacity Required (m^3/day)*	*Residual Capacity (m^3/day)*
Lagoon City STP Approved Capacity (w 3 clarifiers)				2273
Allocated Developments				
Lagoon City Phases 1 and 2 (see Appendix B)	3231	0.35	1131	1142
Unallocated Existing and Future Developments				
Hamlet of Brechin				
Existing Lots	448	0.4545	204	
Public School - Existing	21	0.03	9	
Industrial Park - Existing	64	1.85	29	
Total Brechin - Existing	533		242	900
Veltri	934	0.4545	424	
Perry Ave. Lot 2-20330	168	0.4545	77	
Perry Ave. Lot 2-20320	133	0.4545	61	
Perry Ave. Lot 2-20310	133	0.4545	60	
Perry Ave. Lot 2-20301	120	0.4545	55	
Perry Ave. Lot 2-20200	395	0.4545	179	
Hwy 12 Lot 9-46600	500	0.4545	227	
Industrial Park - Vacant, Undeveloped	532	10.00	242	
Total Brechin - Undeveloped	2915		1325	-425
County Road 47/Simcoe Road				
Simcoe Rd. Lot 9-20701	551	0.4545	250	-675
Lagoon City				
Formerly Phases 3A and 3B	2001	0.35	700	-1376
Concord Point, Brechin Point, Brechin Beach				
Existing	704	0.1818	128	-1504

- To accommodate the ultimate sewage flows from Brechin, the forcemain on County Rd. 47/Simcoe Rd. will be twinned. The installation of the twin pipe could be completed at the same time as the first stage forcemain to reduce overall construction costs. The second stage will also include extending a forcemain to the Lagoon City STP, paralleling the existing Lagoon City sewer system on Laguna Parkway.

- A connection to the second stage forcemain to the Lagoon City STP will be available for the potential development on Simcoe Road (Lot 9-20701).

- The Lakeshore area will be serviced by a pressure sewer system, which will discharge at PS#2 in Lagoon City. Each house will be equipped with a grinder pump.

- At the Lagoon City STP, the construction of the third clarifier will provide sufficient capacity for approximately 718 lots in Brechin and/or lakeshore areas. To accommodate the ultimate population in the service area, the STP will need to be expanded by approximately 66%.

Cost estimates are presented in a separate cost report.

4.5 Environmental Assessment Requirements

According to the MEA's Class Environmental Assessment classification of municipal projects, the establishment of a sewage collection system and connection to an existing STP is considered an 'Approved Activity', as long as the required facilities are in an existing road allowance or in an existing utility corridor. The sewering project would therefore be considered "Schedule A" - approved.

However, expansion of the Lagoon City pumping stations to accommodate sewage flow from Brechin, are considered 'Schedule B' activities and thus require that the Township follow a screening process as described in the Class EA document.

Expansion of the Lagoon City STP, which will be required for the ultimate population in the service area, will be a 'Schedule C' project subject to the full planning process of the Class EA.

5 CONCLUSIONS

The following conclusions have been drawn on the basis of the 1998 sewage system survey and a preliminary analysis of the overall servicing potential:

Survey and Application for funding

- Health and environmental problems are present in both the lakeshore area and in Brechin, caused by malfunctioning sewage disposal systems. These problems could be remedied by the installation of a communal sewage collection and disposal system.

- The construction of a communal sewage system in Brechin should be eligible for funding under the Provincial Water Protection Fund, on the basis of their strict criteria. Servicing the lakeshore area would not be eligible because of the large number of seasonal residences.

  It is our understanding based on recent conversations with MOE officials that the provincial funding for construction projects made available in 1997 has been allocated and no additional funding has been announced in 1998. Nevertheless, it is recommended that an application for funding for the Brechin sewer project be submitted to the MOE with the hope that the province extends the funding program.

Servicing Plan

- The ultimate service area to the Lagoon City STP includes the entire developable land within the limits of Brechin, the industrial park, Lagoon City Phases 1, 2, 3A and 3B, and the areas zoned Lakeshore Residential west of Brechin. It has an equivalent population of 9,934.

- The Lagoon City STP has an allocated capacity of 1,130 m^3/day for a theoretical population of 3,231 in Lagoon City. The STP when built to its approved capacity will be able to accommodate an additional 718 lots or a population of 2,513 (for a total of 5,744, or 58% of the ultimate service area population).

  Future developments will require the expansion of the Lagoon City STP by approximately 66%.

- A sewer system to service the Brechin and lakeshore areas would consist of:
  - a gravity sewer system sized for the ultimate population;
  - a lift station to connect the industrial park to the Brechin system;
  - a pumping station to convey Brechin sewage to the Lagoon City sewer system;
  - a Stage 1 forcemain from the pumping station to the Lagoon City gravity sewer system, and upgrading of two Lagoon City pumping stations;
  - a Stage 2 twinning of the forcemain on County Rd 47/Simcoe Rd. and a new forcemain extending directly to the Lagoon City STP;
  - a pressure sewer system for the lakeshore area connecting to PS#2 in Lagoon City;
  - construction of the Lagoon City STP third clarifier;
  - expansion of the Lagoon City STP at a later date in response to development demands in excess of the current (approved) Lagoon City STP capacity.

6 NEXT STEPS

The next steps towards resolving the sewage disposal problems in Brechin and the lakeshore area should consist of:

- Presentation of the study findings presented in this report to the Ministry of Health and to the Ministry of the Environment.
- Completion and submission of an application for funding under the Provincial Water Protection Fund. A specific Council Resolution will be required for this application.
- Obtaining from Council an approval in principle to the projects as described in this study report, subject to resolving a suitable method for funding/financing.
- Discussions with local developers to assess interest in the project and funding opportunities.
- Development of a rate structure with Township staff using various scenarios regarding provincial and private funding.
- Open House to inform the residents of progress on the project and estimated project costs.
- Development of Terms of Reference for subsequent engineering and environmental assessment studies, as required.

All of which is respectfully submitted

C. C. TATHAM & ASSOCIATES LTD.

S. Troxler.

S. Troxler, P.Eng.

R. J. Meadley, P.Eng.
ST:clh

APPENDIX A
OPEN HOUSE AND OTHER PUBLIC INPUT

BRECHIN, BRECHIN BEACH, BRECHIN POINT AND CONCORD POINT SEWAGE PROJECT

OPEN HOUSE JUNE 5, 1998

INFORMATION SHEET

The Project

The Township of Ramara is considering bringing sewage service to the Hamlet of Brechin and to the lakeshore communities of Brechin Beach, Brechin Point and Concord Point. The sewerage area is shown on the attached Figure. Sewage from the sewerage area would be conveyed to the Lagoon City Sewage Treatment Plant.

The current phase of the Project is to conduct a door-to-door survey of the conditions in the communities.

Why a survey?

The survey will attempt to determine if the communities to be serviced meet the requirements for a grant from the Province of Ontario. Grants from the Provincial Water Protection Fund are only available to communities that clearly demonstrate that there is a health and/or environment related problem. Specifically for communities on individual systems, a significant number of septic systems must be contaminating surface and/or groundwater or causing sewage to pond on the ground surface.

For eligibility, the documentation of problems must have been obtained in the past three years. For this reason, a new survey must be conducted, and results from past surveys can only be used to establish the historical situation.

The results of the survey will be used solely for the purpose of the grant application.

What will the survey consist of?

The survey crew will complete a Site Inspection Report (see Form attached) for each property. They will look for ponding, breakout of sewage and potential sewage discharges off property, as well as for greywater ponding and discharges. They will establish if sufficient space is available to install a replacement tile bed according to current standards and proper setbacks. Each occupant visited will be interviewed, if available, to assist in identifying problems which may not be occurring at the time of the survey.

Where moist areas or ponding are noted beside tile beds, a sample will be taken for analysis. Also, samples of water will be taken in ditches where contamination may be occurring.

Who will be surveyed?

A minimum of 75% of the properties in Brechin and 75% of the properties in Brechin Point, Concord Point and Brechin Beach will be surveyed.

Who will conduct the survey?

Experienced personnel from C.C. Tatham & Associates (Terry Healy and Kevin Leehan), accompanied by Township personnel (Dave Whalen or Dave Readman), will conduct the survey. They will carry proper identification.

When?

The survey will be started during the week of June 8, 1998, and will probably continue for most of the month of June. The survey crew will conduct the survey during regular working hours.

Your Comments

We would like to hear from you, either in the attached Comment Sheet or by phoning or writing to us, particularly if you may not be at your property during the survey. Project contacts are:

C.C. Tatham & Associates Ltd.
115 Hurontario Street, Suite 201
Collingwood, Ontario
L9Y 2L9

Suzanne Troxler
Project Manager
705-444-2565

Terry Healy
Survey Manager
705-645-7756

Township of Ramara
P.O. Box 130
Brechin, Ontario
L0K 1B0

Dave Stephen
Water/Wastewater Sr. Operator
705-484-5374

LAGOON CITY STP

IV
LAGOON CITY

CONCORD POINT

LAKE SIMCOE

BRECHIN POINT

V
BRECHIN BEACH

CON IV LOT 14

CON IV LOT 13

CON IV LOT 12

CON IV LOT 11

CON IV LOT 10

CON IV LOT 9

CON III LOT 14

CON III LOT 13

CON III LOT 12

CON III LOT 11

CON III LOT 10

CON III LOT 9

BRECHIN

LEGEND:

POTENTIAL SEWERAGE AREA

DOOR-TO-DOOR SURVEY AREA

SITE LOCATION PLAN

TOWNSHIP OF RAMARA

BRECHIN, BRECHIN BEACH, BRECHIN POINT AND CONCORD POINT

SEWAGE WORKS PROJECT

STUDY AREA

PLATE 1

BRECHIN SANITARY SURVEY
SITE INSPECTION REPORT

Inspection Date:
Inspected by:

Hydro No.: Establishment Type: Street No.

Name of Owner: Telephone:

Home Address:

Property Description: Lot # Conc. # Reg. Plan #

State No. of	Bedrooms	Shower/Tub	Dishwasher	Sinks	Laundry Units	Toilets	Hot Tubs

OBSERVATIONS

Existing Tile Field	**Tank**
Age of system?	Cement ☐ Steel ☐ Fiberglass ☐
Undersized by current standards?	Is it of proper size?
Does it meet setbacks?	Pump out frequency?
Is the system ponding?	**Soil**
Sewage discharge off property?	Average depth of soil over rock?
Where is discharge occurring?	Type of native soil ?
	Replacement System: Class 4 ☐ 4F ☐ 6 ☐
Grey water ponding?	Can all setbacks be met?
Grey water discharge off property?	Identify if no?
Where is discharge occurring?	Is a replacement area available?

Holding tank **Sampling**: Chemical ☐ Bacterial ☐ N/A ☐

Comments:

Water Supply: Municipal ☐ Dug well ☐ Drilled well ☐ Lake ☐ Other ☐

System Components	**Diagram (Identify system, location, clearances and malfunctions)**
ST: Septic Tank	
TF: Tile Field	
HT: Holding Tank	
LP: Leaching Pit	
SC: Self contained type:	
OT: Other type	
Abbreviations	
OGS: Sewage on ground surface	
NVP: System not vermin proof: insects and animals access sewage	
UND: System is undersized	
PND: Sewage ponding on ground surface	
LK: Sewage is leaking	
TC: Sewage system is too close to a well or surface water	

RECOMMENDATIONS/COMMENTS:

COMMENT SHEET

Name:

Address: **Tel.:**

BRECHIN, BRECHIN BEACH, BRECHIN POINT AND CONCORD POINT SEWAGE PROJECT

ATTENDANCE SHEET

PLEASE PRINT

NAME	MAILING ADDRESS	TELEPHONE NUMBER
JOHN GREGG		
John Hill		
DAVID SHEARER		
BRUCE SELMAN		
BETTY PUCKRIN		
Carl J. Horan		
Alec Li		
Susan Foster-Miller		
Jane Miller		
Randy Young		
ROGER SELMAN		
Paul Jones		
Bob Rutland		
Holly Search		
Isabel Morgan		
DALE WHALEN		
[illegible]		
Andrea Blackmore		
Joe Blackmore		
Frank Germano		
N. Michell Germano		
Jane Germano		
[illegible] O'Sullivan		
BOXCAR WILLYS MARINE		
Walter Cormack		
Helen Cormack		
PAUL + AUDREY CROSSETT		
Mr.-Mrs Cimarelli		
DOUG EMO.		
KWASNIEWSKA, K		

BRENT MILLER

BRECHIN, BRECHIN BEACH, BRECHIN POINT AND CONCORD POINT SEWAGE PROJECT

ATTENDANCE SHEET

PLEASE PRINT

NAME	MAILING ADDRESS	TELEPHONE NUMBER
Barry Williams		
Michael Harrington		

MEMO

C. C. TATHAM & ASSOCIATES LTD.

TO: **File No. 98021**

FROM: **ST**

DATE: **June 9, 1998**

SUBJECT: **Brechin Sewers Sanitary Survey Open House - Summary**

ACTION BY

- The Open House was conducted on Friday June 5, 1998, between 2 and 5 p.m. and between 7 and 9 p.m., at the Township of Ramara Office.

- Staff from CCTA (R. Meadley, T. Healy, K. Lehan, S. Troxler) and from the Township (D. Stephen, R. Bates) were present to answer questions.

- An information sheet was distributed to all attendants. It included: a description of the proposed survey; a copy of the Inspection Report form; a map of the potential sewerage area; contact names and phone numbers; and a comment sheet.

- Thirty five (35) people signed in.

- Approximately half of the attendants were cottage owners (along the lakeshore).

- Representatives of the Simcoe County District School Board, of Winfair (Lagoon City developer), and other local developers, attended the Open House.

- Questions raised:
  - When would sewers be installed?
  - Would connection be mandatory?
  - Would watermains be installed at the same time in Brechin Beach?
  - What would be the cost per lot?
  - Can the sewerage area be changed to include lots between Brechin and Lagoon City? Lots south of the industrial park?
  - Where would the sewers be located?
  - Where would the sewage be treated?
  - Where would the new sewers connect to the Lagoon City system?
  - Is there sufficient capacity at the sewage treatment plant or is an expansion required?
  - Would the additional sewage have a negative impact on the Lagoon city sewer system?
  - Can funding be obtained from government?

ACTION BY

- What are the criteria for funding?
- Is infiltration in Lagoon City sewers under control?
- Would the residents have to be present during the lot-by-lot survey?
- How can you tell if there is a problem with a septic system? With a holding tank?
- Are holding tanks considered an environmental / health problem in terms of the application for funding?
- Could holding tanks be used as part of the sewer system?

MEMO

C. C. TATHAM & ASSOCIATES LTD.

TO: **File No. 98021**

FROM: **ST**

DATE: **July 22, 1998**

SUBJECT: **Brechin Sewers Sanitary Survey**
Responses to notice and Comments Following Open House

ACTION BY

Date	Respondent	Comment or Question
May 25		Is delighted something is being done on project. Wants to be kept informed.
May 26		Will connection be mandatory? Has a cottage at the beach. Is worried about impact of frost on services that are not used during the winter. What will be the cost of sewers? Owns 11 acre at end of Perry Avenue. Spent money to develop plans for 20 0.5 acre lots. Received tentative approval for 10 one acre lots. Is interested in sewers. Wants to know more about cost-sharing, timing, cost. Wants to be kept informed. Lives at Brechin Beach. What information is needed for a grant application? Would connection be mandatory? When would sewers be installed? Where would the sewage be treated?
May 28		Owns property on Lone Birch Trail in Brechin Point. Wants to be kept informed.

ACTION BY

June 9

Owns cottage.
What is the Township planning to do?
Supports the installation of water and sewers.
When would they be built?
Is willing to pay more taxes for services.

June 11

Owns Boxcar Willy's Eatery on Hwy 12, south of Brechin.
Requesting that restaurant be included in service area.
Is it possible?

July 22

Lives on the lakeshore.
Wanted information on status of project?
Concerns about high groundwater.
Questions about pressure sewer systems.

APPENDIX B
LAGOON CITY SEWAGE TREAMENT PLANT ALLOCATED CAPACITY

Lagoon City Sewage Treatment Plant Allocated Capacity

Map Ref. No.	*Development*	*Population*			*Sewage Demand (m3/d) (@ 0.35 m3/cap/d)*
		Number of Units	*Population per Unit*	*Population*	
Phases 1 and 2					
1	Pinetree Villa	16	2.5	40	14.0
2	Genevieve Maisonette	12	2.5	30	10.5
3	Laguna Mews	8	2.5	20	7.0
4	Laguna Shores I	14	2.5	35	12.3
5	Laguna Shores II	24	2.5	60	21.0
6	Laguna Shores III	21	2.5	52.5	18.4
7	Laguna Shores IV	21	2.5	52.5	18.4
8	Laguna Shores V	34	2.5	85	29.8
9	Woodland Shores I	36	2.5	90	31.5
10	Marine Cove Villas I	25	2.5	62.5	21.9
11	Concord Woods	48	3.5	168	58.8
12	Detached Residences	500	3.5	1750	612.5
13	Harbour Village	101	2.5	252.5	88.4
14	Harbour Inn	49	2.5	122.5	42.9
15	Marina (Phase 1-3)	275	0.2	55	19.3
20	Leeward Cove I	16	2.5	40	14.0
21	Woodland Shores II	53	2.5	132.5	46.4
22	Leeward Cove II	22	2.5	55	19.3
23	Heron's Landing Phase I	10	2.5	25	8.8
23	Heron's Landing Phase II	16	2.5	40	14.0
23	Heron's Landing Phase III	25	2.5	62.5	21.9
	Total			**3230.5**	**1130.7**