E03-CL

MUNICIPALITY OF DYSART ET AL

HALIBURTON SEWAGE TREATMENT PLANT EXPANSION

MOE DIRECT GRANT SEWAGE WORKS PROJECT NO. 3-0706

CLASS ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL STUDY REPORT

CONSULTANTS

totten sims hubicki associates

MUNICIPALITY OF DYSART ET AL

HALIBURTON SEWAGE TREATMENT PLANT EXPANSION

MOE DIRECT GRANT SEWAGE WORKS PROJECT NO. 3-0706

CLASS ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL STUDY REPORT

TOTTEN SIMS HUBICKI ASSOCIATES

OCTOBER, 1989

CONSULTANTS

totten sims hubicki associates

G.L. TOTTEN B.Sc., P.Eng.
R.E. SIMS B.A.Sc., P.Eng.
J.M. HUBICKI B.A.Sc., OAA, P.Eng.
R.L. WINDOVER M.Sc., P.Eng.
P.C. EBERLEE B.A.Sc., P.Eng.

TOTTEN SIMS HUBICKI ASSOCIATES (1981) LIMITED
1500 HOPKINS STREET, WHITBY, ONTARIO
CANADA, L1N 2C3

(416) 668-9363 Fax: 668-0221

October 16, 1989

Ministry of the Environment
Project Engineering Branch
135 St. Clair Avenue West
Toronto, Ontario
M4V 1P5

Attention: Mr. M. Latta, P. Eng.
Manager, SW/WC/C Regions

Re: Municipality of Dysart et al
Haliburton Sewage Treatment Plant Expansion
MOE Direct Grant Sewage Works Project No. 3-0706
Environmental Study Report
TSH Project No. 52-7897

Dear Sir:

We are pleased to submit, for your review, our Environmental Study Report on the Haliburton Sewage Treatment Plant Expansion.

During the course of preparing this report, information was received from staff of the Ministry of the Environment and the Municipality of Dysart et al. This assistance is gratefully acknowledged.

Yours very truly,

R. B. Baker, P. Eng.
Vice President
Environmental Engineering Group

RBB/la
Encl.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

TABLE OF CONTENTS (Cont'd)

TABLE OF CONTENTS (Cont'd)

TABLE OF CONTENTS (Cont'd)

LIST OF TABLES

LIST OF FIGURES

CONVERSION FACTORS

Length

1 metre (m)	=	3.28 feet
1 millimetre (mm)	=	0.039 inches
1 kilometre (km)	=	0.621 miles

Area

1 hectare (ha)	=	2.47 acres
1 square metre (m^2)	=	10.76 square feet

Volume

1 cubic metre (m^3)	=	35.29 cubic feet
	=	220.26 gallons
1 litre (L)	=	0.220 gallons

Velocity

1 metre per second (m/s)	=	3.28 feet per second

Flowrate

1 litre per second (L/s)	=	0.035 cubic feet per second
	=	13.24 gallons per minute
1 cubic metre per day (m^3/d)	=	220.6 gallons per day

Unit Flowrate

1 litre per capita per day (L/c/d) = 0.220 gallons per capita per day

1 litre per second per hectare (L/s/ha)= 7696 gallons per day per acre

1 cubic metre per hectare per day (m^3/ha/d) = 89.07 gallons per acre per day

1 litre per second per square metre (L/s/m^2) = 1.230 gallons per minute per square foot

Power

1 kilowatt (kW)	=	1.34 horsepower

Pressure

1 kilopascal (kPa)	=	0.145 pounds per square inch (psi)

LIST OF ABBREVIATIONS

cu.m	Cubic Metres
dia.	Diameter
EA	Environmental Assessment
ESR	Environmental Study Report
ha	Hectare
hp	Horsepower
kg	Kilogram
km	Kilometre
kPa	Kilopascal
kW	Kilowatt
L	Litre
L/c/d	Litres per capita per day
L/s	Litres per second
$L/s/m^2$	Litres per second per square metre
m	Metre
m^3	Cubic Metres
m^3/d	Cubic Metres per day
mg/L	Milligrams per litre
mm	Millimetre
MOE	Ministry of the Environment
MEA	Municipal Engineers Association
OWRC	Ontario Water Resources Commission
RMD	Regional Municipality of Durham
rpm	Revolutions per minute
s	Second
TDH	Total Dynamic Head
TSH	Totten Sims Hubicki Associates
ug/L	Microgram per litre
umho/cm	Micromhos per centimeter

SUMMARY OF THE REPORT

This report outlines the preferred alternative design concept for the Haliburton sewage treatment plant expansion, summarizes the design parameters utilized in sizing of the main sewage pumping station and the sewage treatment facilities expansion, and identifies the potential environmental impacts and mitigating measures in compliance with Phases 3 and 4 of the Class Environmental Assessment Process.

In accordance with the environmental, technical and economical evaluation of the five (5) proposed alternatives, it was determined in the Phase 1 and 2 report that Alternative 1, expand the existing plant with discharge to the Drag River is the preferred solution for the expansion of the Haliburton sewage treatment plant.

Under Alternative 1, it will be necessary to expand the existing plant capacity from 542 m^3/d to 1,933 m^3/d in order to serve an equivalent population of 4,259 persons with an average per capita flow of 454 L/d.

The preferred design concepts for Alternative 1 are as follows:

a) Installation of the third pump in the main sewage pumping station.

b) Construction of a new flow equalization tank at the existing site.

c) Construction of a new aerated grit tank.

d) Construction of an extended aeration activated sludge plant including aeration tank, secondary clarifiers, sludge holding tanks and sludge recirculation pumps.

SUMMARY OF THE REPORT (Cont'd)

e) Installation of phosphorus removal chemical feed facilities including ferric chloride or alum feed system and polymer addition system.

f) Construction of new effluent filtration facilities including polishing filters and backwash water system.

The effluent from the expanded Haliburton sewage treatment plant will produce an acceptable effluent concentration to meet effluent criterion of 5 mg/l for BOD_5, 5 mg/l for suspended solids, and 0.2 mg/l for total phosphorus. Those effluent criterion have been confirmed by the Ministry of the Environment.

The estimated cost to undertake the proposed sewage treatment facilities expansion under the preferred alternative, based on Fall 1990 prices and including an allowance for engineering and contingencies, is $2,310,000.

Upon approval of this report by the Ministry of the Environment and the Municipality of Dysart et al, the ESR will be submitted to the Clerk of the Municipality of Dysart et al and then placed in the Public Record for a review period of thirty (30) days. If there are no irreconcilable objections to the proposed action, the project may then proceed to final design and construction.

1.0 INTRODUCTION AND BACKGROUND

1.1 The Environmental Study Report

The Environmental Assessment Act, S.O. 1975, was enacted in the Province of Ontario in July of 1975, to ensure that environmental concerns are addressed in the implementation of public undertakings.

Class Environmental Assessments are documents prepared to document the assessment procedure, the extent of the document depends on the nature of the undertaking. Once approved by Cabinet, the Class EA provided a planning framework for other projects of a similar nature. The Municipal Engineers Association (MEA) prepared the Class EA document for municipal water and sewage projects, the format of which is followed in preparing this report.

The Environmental Study Report (ESR) represents the documentation of the Class EA planning and design process which concludes with project construction in Phase 5. An ESR is prepared in Phases 3 and 4 when design work has progressed to the point where details of any environmental protective measures to be incorporated in the construction package have been finalized. The report includes a discussion of the purpose of the project, the project approach, and the existing social and natural environmental conditions in the study area. The ESR addresses the planning solutions and design alternatives for implementing the preferred solution and establishes the construction requirements.

Following its completion, the ESR is submitted to the Clerk of the Municipality of Dysart et al where it is placed in the Public Record for a review period of thirty (30) days. If there are no irreconcilable objections to the proposed action, the project may then proceed to final design and construction.

1.2 Purpose of the Project

The Municipality of Dysart et al intends to expand the Haliburton Sewage Treatment Plant in order to accommodate the projected future sewage flows from the Hamlet of Haliburton and the proposed Kashagawigamog Sewer Extension.

The Terms of Reference, which are included in Appendix A, have been compiled on the assumption that the project is to be a Schedule "C" project, as defined in the Class Environmental Assessment (EA) Process. The planning and design process for this project follows the 5 phase procedure established for Class EA Type Municipal Sewage Projects:

Phase 1 - Identify the problem;
Phase 2 - Preliminary Report;
Phase 3 - Environmental Study Report;
Phase 4 - Environmental Study Report Review;
Phase 5 - Final Design, Construction, and Commissioning.

The first four (4) phases are planning and preliminary design phases. Conditions for the successful completion of Phase 4 of the project will include but not be limited to the following:

1. MOE acceptance of the ESR and the issue of a Conditional Certificate of Approval for the project.

2. Confirmation from the MOE that the works identified in the ESR will receive financial assistance under the Direct Grant Program.

1.3 Background of the Report

In 1975, the Ministry of the Environment (MOE) constructed a sewage collection system and treatment plant to serve the Hamlet of Haliburton. The existing sewage treatment plant is located on Highway 121 at the westerly limit of the Hamlet and serves residences east of the plant.

On February 16, 1983, Rysco Engineering submitted a Feasibility Study Report on the provision of a sewage collection system to accommodate additional raw sewage from various resorts located on the north shore of Lake Kashagawigamog. In May 1984, the Provincial Government approved a grant for an extension of the existing sanitary sewer system to the north shore of Lake Kashagawigamog up to the Willow Beach cottages. The firm of Rysco Engineering was retained to undertake design of the sanitary sewer extension under MOE Direct Grant Sewage Works Project No. 3-0579. Rysco Engineering completed the design and submitted to the MOE in 1985 for approval. Prior to granting approval of the works, the MOE Environmental Approvals Division requested an assessment of the existing sewage treatment plant capacity.

Totten Sims Hubicki Associates (TSH) were subsequently retained by Rysco Engineering to assess the capacity of the existing sewage treatment plant (STP). TSH submitted their report entitled "Township of Dysart et al, Haliburton Kashagawigamog Sewer System Extension, MOE Project No. 3-0579, Haliburton Sewage Treatment Plant Expansion" to Rysco Engineering and the MOE on August 17, 1987. The report concluded that the existing STP did not have sufficient capacity to accommodate the anticipated future flows from Haliburton and the proposed sewer extension to the north shore of Lake Kashagawigamog and recommended that the existing plant be expanded to meet the projected future flows.

In May 1988, TSH were authorized by the Ministry of the Environment to undertake an Environmental Assessment Report, the scope of which included investigating the various alternatives to expanding the existing STP and recommending a preferred solution.

1.3 Background of the Report (Cont'd)

The report, entitled "Haliburton Sewage Treatment Plant Expansion for the Municipality of Dysart et al, Ministry of the Environment Project No. 3-0706, Class Environmental Assessment Phases 1 and 2 Report", was submitted to the Ministry on August 4, 1989. The report identified the deficiencies of the existing Haliburton Sewage Treatment Plant, outlined alternative solutions to correct the deficiencies, presented the environmental evaluation criteria to be considered, evaluated proposed alternatives, and recommended a preferred solution in compliance with Phase 1 and Phase 2 of the Class EA process.

The preferred solution is to expand the existing sewage treatment plant with discharge to the Drag River on the Kashagawigamog Lake and Grass Lake system as outlined in Alternative 1.

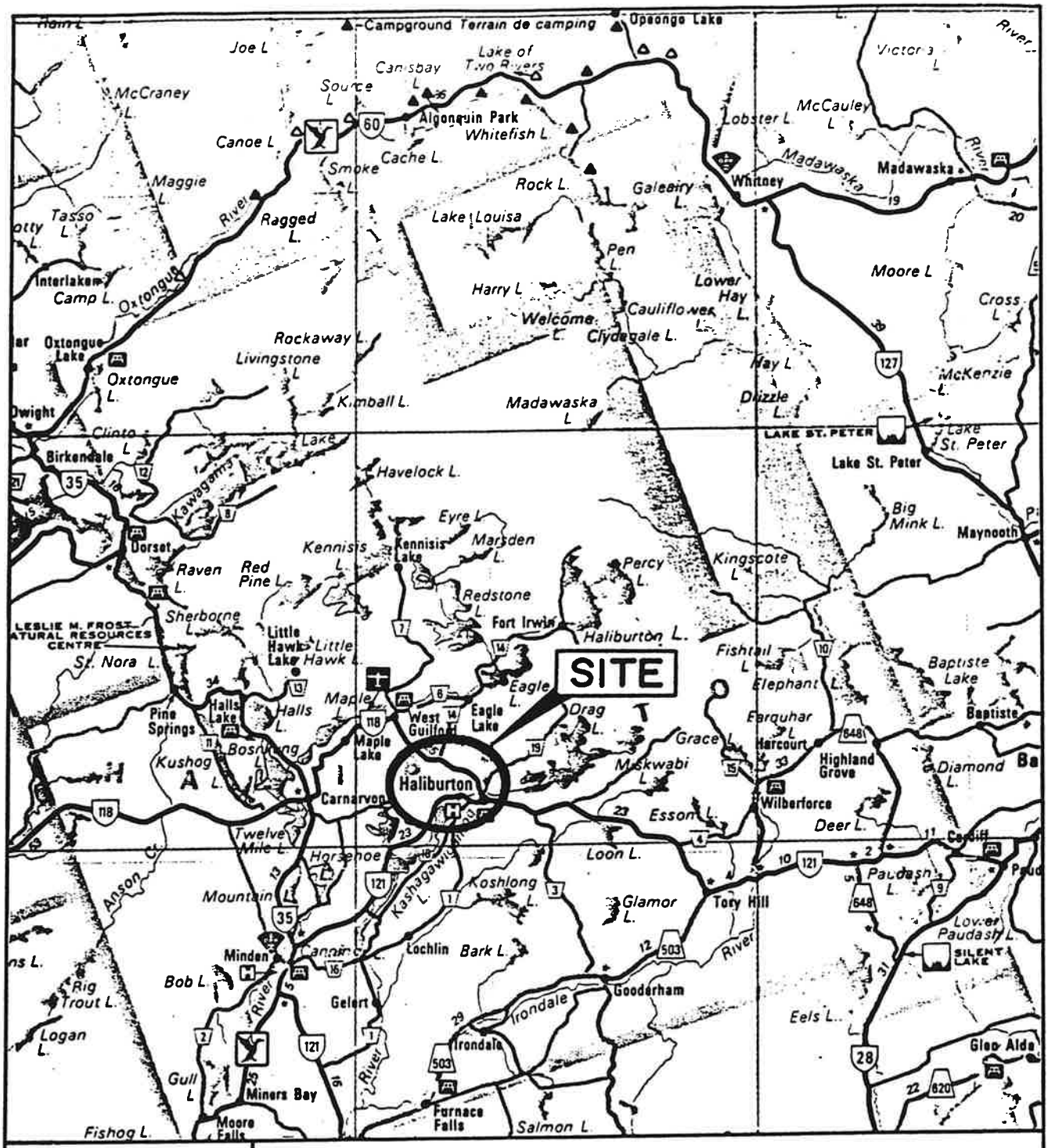
The Phase 1 and 2 report has been reviewed and accepted by the Ministry of the Environment.

On September 19, 1989, the Ministry of the Environment authorized TSH to proceed with the preparation of Phase 3 and 4 Report. A letter of the authorization is enclosed in Appendix B of the Report.

1.4 General Description of the Project

Haliburton, in conjunction with the Townships of Bruton, Clyde, Dudley, Eyre, Guilford, Harburn, Harcourt and Havelock comprise the Municipality of Dysart et al, with administration offices located in Haliburton.

The Hamlet of Haliburton is located at the junction of Highways 118 and 121 in the County of Haliburton, as shown in Figure 1.1. The community is bisected by the Drag River and is situated on the eastern and southern shores of Head Lake. The Drag River connects Head Lake to Grass Lake, which drains into Kashagawigamog Lake and the Burnt River of the Trent River System.



totten sims hubicki associates

ENGINEERS ARCHITECTS AND PLANNERS

MUNICIPALITY OF DYSART et al
HALIBURTON
SEWAGE TREATMENT PLANT EXPANSION

KEY PLAN

FIGURE 1.1

1.4 General Description of the Project (Cont'd)

Rock outcrops predominate around the perimeter of the community with shallow depths of overburden predominant throughout.

Historically, Haliburton is known for its forest and water resources. Today, the community is the centre of the Haliburton Highlands vacation area, with an economy based mainly on tourism and recreation.

Haliburton is currently experiencing a rapid increase in population due to an increase in the construction of seasonal and permanent homes, the expansion of existing resorts, and the increase in construction of new commercial and industrial establishments. The existing sanitary sewage system serves only the centre area in the Hamlet of Haliburton.

Proposals for development either adjacent to or near the existing sewage treatment plant or proposed sewer extension have been received by the Municipality. Approval of these developments is contingent upon the provision of suitable sanitary sewage facilities, thus, the need for additional sanitary sewage facilities is a growing concern that must be addressed.

1.5 Statement of the Rationale for the Project

1.5.1 Summary of the Findings of the Phase 2 Report

The major findings and conclusions of the Phase 2 Report are summarized as follows:

1. The existing Haliburton sewage treatment facility was originally designed to operate as an extended aeration process with a capacity of 455 m^3/d for a population of 1,000 persons at an average per capita flow of 454 L/d.

2. The current average sewage flow to the plant is approximately 317 m^3/d which yields an average per capita flow of 360 L/d for a service population of 880 persons.

1.5 Statement of the Rationale for the Project (Cont'd)

3. A plant capacity evaluation based on current MOE Guidelines for the Design of Sewage Treatment Plants was undertaken. The result of evaluation suggested that the existing Haliburton Sewage Treatment Plant should continue to operate using the existing extended aeration process with an allowable capacity of 542 m^3/d.

4. To accommodate additional sewage flows from resorts along the north shore of Lake Kashagawigamog and commercial development along Highway 121, as well as additional growth in the Hamlet of Haliburton, expansion of the facility will be necessary. It is proposed to expand the existing plant to 1,933 m^3/d to serve a population of 4,259 persons, with an average per capita flow of 454 L/d.

1.5.2 General Planning Alternatives

Several general alternatives were considered during the course of preparing the Phase 2 Report as follows:

1. Alternative 1 - Expand Existing Sewage Treatment Plant with Outlet Sewer to Drag River;

2. Alternative 2 - Expand Existing Sewage Treatment Plant with Outlet Sewer to Grass Lake;

3. Alternative 3 - Construct a New Sewage Treatment Plant to Service Highway 121 Development;

4. Alternative 4 - Construct a New Sewage Treatment Plant to Service Highway 121 Development and Hamlet of Haliburton; and

5. Alternative 5 - Expand Existing Sewage Treatment Plant with Outlet Sewer to Burnt River.

1.5 Statement of the Rationale for the Project (Cont'd)

Based on environmental, technical and economical considerations, it was determined that Alternative 1, expand the existing plant with discharge to the Drag River, is the preferred solution.

1.6 Determination of the Class EA Category

It was determined that this project falls under Schedule 'C' of the Class Environmental Assessment for Municipal Sewage projects, as defined by Item 2 of Schedule C for Sewage projects, i.e.

> "2. construct new sewage treatment plant or expand existing sewage treatment plant beyond existing rated capacity."

Therefore, it will be necessary to undertake the Phase 3 and Phase 4 activities in order to prepare an Environmental Study Report.

2.0 PROJECT APPROACH

2.1 Environmental Assessment

The environmental assessment for this project was undertaken in accordance with the 'Class Environmental Assessment for Municipal Sewage and Water Projects' document prepared by the Municipal Engineers Association and approved by the Ministry of the Environment. This document serves as an approved procedure under the Environmental Assessment Act, 1975 for the planning, design and construction of municipal sewage and water projects. The environmental assessment process takes into account the potential impacts of the project on the surrounding environment. Information and data on the existing social and natural environment have been gathered. In addition, interested parties have been contacted and encouraged to participate in the environmental assessment process.

During Phases 3 and 4 of the EA process, an investigation of the potential impacts has been undertaken. In addition, the required mitigating and monitoring measures have been investigated and documented.

A summary of the planning and design processes followed during Phases 3 and 4 is as follows:

1. Alternative design "concepts" for the preferred solution are identified.

2. An inventory of the natural and socio-economic environment is prepared. Only the components of the environment that will be affected by the project are considered.

3. The impacts of each design alternative on components of the environment are identified and evaluated.

2.1 Environmental Assessment (Cont'd)

4. Details of the preferred solution and design concepts will be presented to the MOE staff for review. The preceeding information will then be presented to Municipal Council and the interested public.

5. Upon receiving input from review agencies and interested parties, the environmental significance of the preferred concept will be updated and finalized.

6. Finalize Environmental Study Report and place ESR in the "Public Record File" for review.

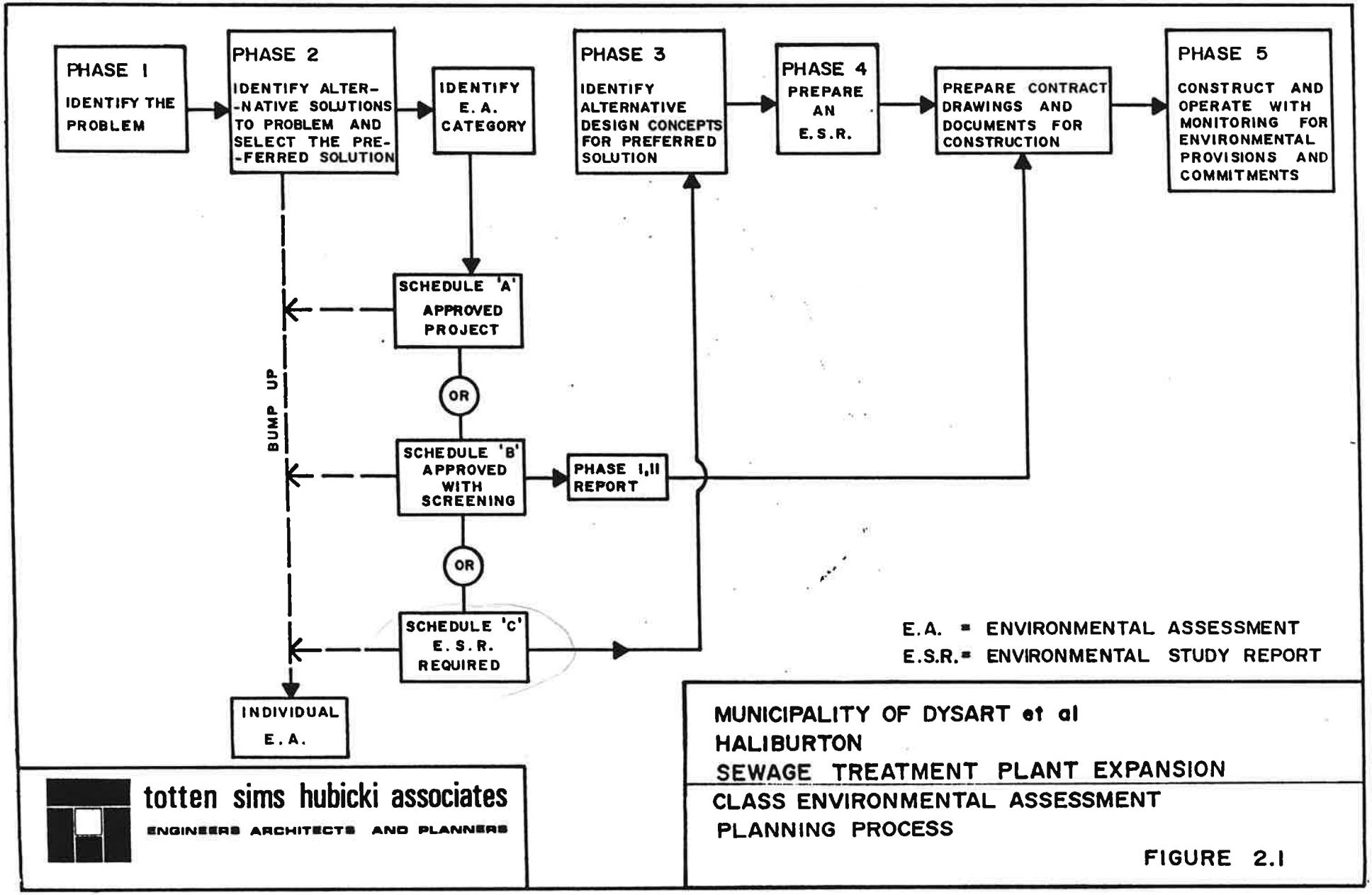
2.2 Project Organization and Staging

The procedure outlined in the Class EA document for municipal sewage and water projects has been followed in the implementation of this project. A generalized outline of the planning is shown in Figure 2-1.

2.3 Internal Involvement

The Municipality of Dysart et al, as represented by the Reeve and Council, is responsible for the implementation of the project. The Clerk-Treasurer provides the liaison between the municipality and other involved parties.

The Project Engineering Branch of the Ministry of the Environment provides project management services and the District MOE office in Gravenhurst provides information on the operation of the existing STP.



totten sims hubicki associates
ENGINEERS ARCHITECTS AND PLANNERS

MUNICIPALITY OF DYSART et al
HALIBURTON
SEWAGE TREATMENT PLANT EXPANSION

CLASS ENVIRONMENTAL ASSESSMENT
PLANNING PROCESS

FIGURE 2.1

2.4 External Involvement

2.4.1 Mandatory Contacts Related to Project

External involvement in the project by other ministries and agencies, local municipalities and other groups interested in the project was accomplished through notification during the preparation of Phases 1 and 2 Report. Only those parties expressing an interest in further involvement in the project were kept informed on the progress of the project.

As noted in the Phase 1 and 2 Report, three (3) mandatory contacts wanted to be informed of the progress of the project:

1. Ministry of Natural Resources
   Minden District Office
   Minden, Ontario
   K0M 2K0

2. Environment Canada (Parks)
   Trent-Severn Waterway
   P. O. Box 567
   Peterborough, Ontario
   K9J 6Z6

3. Ministry of Tourism and Recreation
   Tourism and Recreation Operations
   Eastern Region
   305 Stewart Street
   Peterborough, Ontario
   K9J 3N2

Copies of correspondence from the above-noted three (3) mandatory contacts are attached in Appendix C.

The mandatory contacts expressed the following concerns about the proposed Haliburton Sewage Treatment Plant Expansion:

1. The Ministry of Natural Resources is concerned about the provision of good quality effluent (within the Provincial Water Quality Objectives or better) to minimize impacts on the dissolved oxygen. In addition, any work adjacent to a watercourse should include measures that will avoid and/or minimize bank erosion and siltation. This is especially important in the case of Drag River, since it is an important habitat and spawning area for various fishes.

2.4 External Involvement (Cont'd)

2. Environment Canada (Parks) is concerned about the implications of decreased summer time water flows in the Trent-Severn watershed to the design or sizing of the Haliburton Sewage Treatment Plant expansion.

3. The Ministry of Tourism and Recreation is concerned about possible suspensions of tourism development activities due to lack of excess capacities of existing sewage treatment plants in the Haliburton area.

2.4.2 Mandatory Contact Related to Report Review

Upon completion of the Phase 1 and 2 Report, the report was forwarded to the MOE, other ministries and agencies, local municipalities and other groups interested in the project for review on August 10, 16 and 25, 1989. The report was forwarded to the following interested parties:

1) Environment Canada Parks - Trent-Severn Waterway
2) Ministry of Natural Resources - Minden District Office
3) Ministry of the Environment - Project Engineering Branch
4) Ministry of the Environment - Central Region
5) Ministry of the Environment - Gravenhurst District Office
6) Ministry of the Environment - Limnology Section
7) Ministry of Tourism and Recreation
8) Municipality of Dysart et al
9) Township of Snowden
10) Township of Anson, Hindon and Minden
11) Canning Lake Property Owners Association
12) Kashagawigamog Lake Cottagers Association

The copies of letters forwarded to the above interested parties are enclosed in Appendix D. Comments were received from the following:

2.4 External Involvement (Cont'd)

1) Ministry of Natural Resources - Minden District Office
2) Ministry of the Environment - Project Engineering Branch
3) Ministry of the Environment - Central Region
4) Canning Lake Property Owners Association - Kevin Walters
5) Miskwabi Area Cottagers Association - J. G. Strickland

The copies of the comments are contained in Appendix E1 to E3 of this report. In general, the comments from the above-noted mandatory contacts are summarized as follows:

1) The Ministry of Natural Resources (MNR) states that Kashagawigamog Lake is a Policy II lake and no increase in phosphorus loading is acceptable. The other concern is in regard to any reduction in oxygen concentration and the effect this would have on Lake Trout habitat. The copy of the letter from the MNR dated September 12, 1989 is enclosed in Appendix E1.

2) The Ministry of the Environment Project Engineering Branch provides the review comments on the report and requests that the comments be incorporated into the revised Phase 1 and 2 Report. The copy of the letter from the MOE dated September 5, 1989 is enclosed in Appendix E1.

3) The Ministry of the Environment Central Region outlines the allowable total phosphorus load of 160 kg/yr. in Kashagawigamog Lake which yields an effluent phosphorus concentration of 0.23 mg/l from the average daily flow of 1,933 m^3/d. This translates to an effluent requirement of 0.2 mg/l from the expanded Haliburton Sewage Treatment Plant. The copy of the letter from the MOE dated September 15, 1989 is enclosed in Appendix E1 of this report.

4) The Canning Lake Property Owners Association is opposed to any changes to the Dysart Sewage Treatment Plant or related facilities that do not result in a net decrease in effluent discharge to the lake chain. A copy of the letter from Mr. K. Walters dated September 18, 1989 and the TSH response are enclosed in Appendix E2 of this report.

2.4 External Involvement (Cont'd)

5) The Miskabi Area Cottagers Association provides various comments on the Phase 1 and 2 Report. The copy of the letter from J. G. Strickland dated September 5, 1989 together with the TSH response is enclosed in Appendix E3 of this report.

2.4.3 Mandatory Contact Related to Plant Expansion

During the course of preparing this report, comments from several cottagers associations concerning the expansion of the Haliburton sewage treatment plant were submitted to the Minister of the Ministry of the Environment on September 5, 1989. These cottagers associations have requested that an individual environmental assessment be conducted for this project.

The requested letters were received from the following:

1) Lake Kashagawigamog Association - John Puffer letter dated September 5, 1989
2) Canning Lake Property Owners' Association - Gary Kapac letter dated September 5, 1989
3) Mr. Rhodes Arnold - letter dated August 6, 1989

The copies of the above-noted letters and the TSH responses are included as Appendix F1 and F2 of this report.

2.5 Public Involvement

2.5.1 Public Meeting No. 1

The first public meeting was held at the Royal Canadian Legion in Haliburton on June 21, 1988. The results of Public Meeting No. 1 have been outlined in the Phase 1 and Phase 2 Report.

2.5 Public Involvement (Cont'd)

2.5.2 Public Meeting No. 2

The second public meeting was held at the Legion Hall in Haliburton on August 15, 1989. The purpose of this public meeting was to outline the following:

1) The Environmental Assessment process
2) Alternative methods of treatment plant expansion
3) Results of the evaluation of each alternative
4) The preferred solution

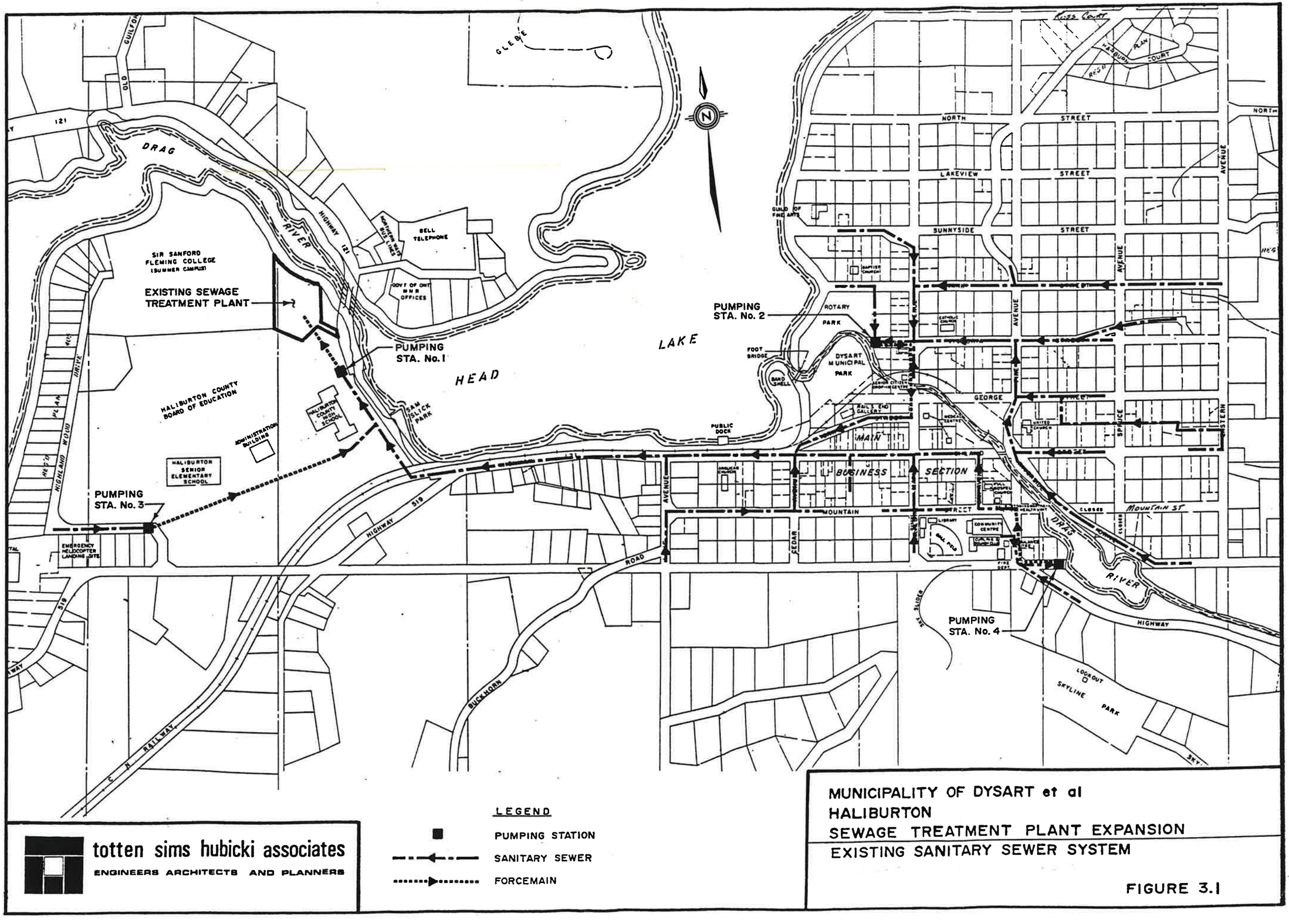
The information on Public Meeting No. 2 is enclosed as Appendix G of this report. Forty-three (43) persons attended the second public meeting as follows:

Private Citizens	39
Ministry of the Environment	1
Totten Sims Hubicki Associates	3
Total	43

The public was encouraged to comment on the project by August 25, 1989. A total of four (4) responses were received from the public as follows:

1) Betty Guillianno dated August 16, 1989
2) L. L. Cooper dated September 8, 1989
3) Glen Carter dated August 30, 1989
4) Dawn Brohman dated August 24, 1989

Copies of comments received and the TSH responses are included as Appendix H1 to H4 of this report.


DRAG
RIVER
HIGHWAY 121
OLD GUILFORD
GLEBE
SIR SANFORD FLEMING COLLEGE (SUMMER CAMPUS)
EXISTING SEWAGE TREATMENT PLANT
PUMPING STA. No. 1
PUMPING STA. No. 2
PUMPING STA. No. 3
PUMPING STA. No. 4
BELL TELEPHONE
GOVT OF ONT MNR OFFICES
HALIBURTON COUNTY BOARD OF EDUCATION
HALIBURTON COUNTY HIGH SCHOOL
ADMINISTRATION BUILDING
HALIBURTON SENIOR ELEMENTARY SCHOOL
SAM SLICK PARK
PUBLIC DOCK
LAKE HEAD
ROTARY PARK
DYSART MUNICIPAL PARK
FOOT BRIDGE
BAND SHELL
EMERGENCY HELICOPTER LANDING SITE
HIGHLAND ROAD
HIGHWAY 519
BUCKHORN ROAD
C N RAILWAY
NORTH STREET
LAKEVIEW STREET
SUNNYSIDE STREET
GEORGE STREET
MOUNTAIN STREET
AVENUE
BUSINESS SECTION
MAIN STREET
MOUNTAIN
CEDAR
SPRUCE
GUILD OF FINE ARTS
BAPTIST CHURCH
CATHOLIC CHURCH
UNITED CHURCH
RAIL'S END GALLERY
SENIOR CITIZEN DROP-IN CENTRE
MEDICAL CENTRE
LIBRARY
COMMUNITY CENTRE
CURLING & BOWLING CLUB
FIRE DEPT.
SKI SLIDE
LOOKOUT
SKYLINE PARK
CLOSED
LEGEND
PUMPING STATION
SANITARY SEWER
FORCEMAIN
totten sims hubicki associates
ENGINEERS ARCHITECTS AND PLANNERS
MUNICIPALITY OF DYSART et al
HALIBURTON
SEWAGE TREATMENT PLANT EXPANSION
EXISTING SANITARY SEWER SYSTEM
FIGURE 3.1

3.0 INVENTORY OF EXISTING CONDITIONS

3.1 Natural Environment

3.1.1 Physiography

The topography within the study area is typical of the Canadian Shield. Soil cover is generally thin, and it is underlain by Precambrian Shield bedrock. Bedrock outcrops are visible throughout the entire community.

3.1.2 Soils

The majority of the study area is covered with a variable depth Sherborne till over undulating and ridgy igneous and metamorphic bedrock. The Sherborne till is a low base silty to loamy sand or sandy loam derived from granite, granite-gneiss and syenite.

3.1.3 Water Resources

The Haliburton Sewage Treatment Plant presently discharges to the Drag River, a connecting waterway between Head Lake to the north and Grass Lake to the south. Grass Lake subsequently discharges into Kashagawigamog/ Canning Lake before discharging to the Burnt River south of Gelert.

Environment Canada's Water Resources Branch, Water Survey of Canada, maintains a permanent gauging station No. 02HF003, located at latitude 44-42-03N and longitude 78-40-40W on the Burnt River. The drainage area for the station is 1,270 km^2.

The Trent-Severn Waterway maintains a permanent gauging station on the Burnt River at Gelert. The drainage area for this station is 543 km^3.

3.1 Natural Environment (Cont'd)

The Trent-Severn Waterway is part of a water resources system comprised of eight (8) navigable lakes and connecting channels and thirty-six (36) reservoir lakes. Some lakes in the Municipality of Dysart et al are used as reservoir lakes in supplying water to meet minimum flow requirements in the rivers and waterway.

By utilizing the average annual flow rates at the two gauging stations and the drainage area for each station, the average flows for the Drag River, Grass Lake and Kashagawigamog/Canning Lakes were calculated. The drainage areas, derived from a 1:50,000 scale map are as follows:

Drag River	157.0 km^2
Grass Lake	161.4 km^2
Kashagawigamog/Canning	270.8 km^2

The following annual flow rates were determined based on the flow records at the gauging stations:

	Water Survey of Canada Flow Records	Trent-Severn Waterway Flow Records
Drag River	2.36 m^3/s	2.53 m^3/s
Grass Lake	2.42 m^3/s	2.60 m^3/s
Kashagawigamog/Canning	4.37 m^3/s	4.65 m^3/s

The seven day minimum flow for a return period of 20 years (7Q20) is as follows:

	Water Survey of Canada Flow Records	Trent-Severn Waterway Flow Records
Drag River	0.28 m^3/s	0.24 m^3/s
Grass Lake	0.29 m^3/s	0.24 m^3/s
Kashagawigamog/Canning	0.53 m^3/s	0.44 m^3/s

3.1 Natural Environment (Cont'd)

3.1.4 Aquatic Life and Fisheries

Kashagawigamog Lake is oligotrophic and it supports cold water fisheries. It is reported by staff at the Ministry of Natural Resources that Kashagawigamog Lake supports the following fish communities:

- rainbow trout,
- lake trout,
- lake whitefish,
- cisco (lake herring),
- rainbow smelt,
- northern pike,
- suckers (longnose and white),
- minnows (lake chub, golden shiner, blackhose shiner, spottail shiner, and bluntnose minnow),
- catfish (black bullhead and brown bullhead)
- cod (burbot),
- sunfish (rock bass), pumpkinseed, small mouth bass and large mouth bass), and
- perch (yellow perch, yellow pickerel, Iowa darter and logperch).

3.1.5 Woodlots

The study area is located within the Minden Forest Management Unit. As outlined in the Ministry of Natural Resources Forest Management Plan, the forest species and stands in the Minden Forest Management Unit consists of the following:

- Hard maple
- Beech
- Basswood
- Soft maple
- White ash
- Black ash
- Red oak
- Black cherry
- White birch
- Yellow birch
- Poplar
- Ironwood
- Elm
- White pine
- Red pine
- Scotch pine
- Hemlock
- Balsam
- White spruce
- Larch (Tamarack)
- Cedar

3.1 Natural Environment (Cont'd)

3.1.6 Wildlife

The habitat in the study area supports an extensive wildlife population. Prevalent animals in the study area as reported by staff of the MNR include:

- deer,
- migratory birds,
- song birds,
- rabbits,
- beaver,
- mink,
- otter,
- fox, and
- wolves.

3.2 Socio-Economic Environment

3.2.1 Land Use

Haliburton has historically developed as a recreation oriented community, which provides basic services to the vacationing public, seasonal and permanent residences.

Existing land use patterns within Haliburton are typical of most recreational communities. The waterfront area is intensely developed with dwellings and the core area is composed of a mixture of residential, commercial and limited industrial uses.

Significant expansion of the developed land is limited due to natural constraints within the community including rock outcrops and thin overburden soils.

3.2 Socio-Economic Environment (Cont'd)

3.2.2 Utilities

There is not a piped municipal water system in the study area and the residents as well as the commercial and industrial establishments rely on private wells for their water supply.

The existing sewage system services the Hamlet of Haliburton, while the remaining developed areas are serviced by subsurface disposal systems.

3.2.3 Economics

The economy in Haliburton consists of small services industries. Outlets provide services to the vacationing public, seasonal and permanent residences.

3.2.4 Architecturally, Historically, or Archaeologically Significant Sites

A database search conducted by the Archaeology Unit of Heritage Branch of the Ministry of Culture and Communications shows that there are no active archaeological sites in the study area.

3.2.5 Recreation

There are numerous recreational opportunities in the vicinity of the study area. Popular spring and summer activities include boating, swimming, canoeing, fishing and hiking. Popular fall and winter activities include hunting, ice fishing, skiing and snowmobiling.

3.3 Existing Haliburton Sewage System Servicing Conditions

3.3.1 General

The existing Haliburton sanitary sewage system consists of a network of sanitary sewers, four (4) sewage pumping stations and a sewage treatment plant. The existing system serves the centre core area of the Hamlet.

The locations of the existing facilities are shown in the following Figure 3.1. The pumping stations and treatment facilities are outlined in the following sections.

3.3.2 Pumping Stations

3.3.2.1 Pumping Station No. 1

Pumping Station No. 1 is the main pumping station for the system and is located approximately 200 m south of the sewage treatment plant. Sewage from the entire sanitary sewer system flows into this station before being pumped to the treatment plant. The station was constructed along with the sewage treatment plant in 1975, with design parameters as follows:

Design period	1973 to 1992
Design population	2,100
Average per capita flow	454 L/d
Average daily flow	5.26 L/s
Peak factor	3.8
Peak flow	20 L/s

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

Pumping Station No. 1 is a submersible pumping station with a plan area of 2.74 m x 2.74 m (inside dimensions) and a depth of approximately 7 m. The inlet consists of a 450 mm diameter gravity sewer connected to the station at an invert elevation of 316.3 m. Sewage from the inlet passes through a bar screen before entering the wet well.

The station contains two (2) 13.4 kW Flygt CP3151 submersible sewage pumps with No. 415 impellers. Each pump is rated at 20 L/s against a TDH of 19.8 m. The pumps are controlled by float regulators suspended in the wet well which are set for automatic operation as follows:

Pump Station floor elevation	314.63 m
Stop both pumps	315.09 m
Start lead pump	315.63 m
Start lag pump	315.85 m
Alarm level	316.16 m
Emergency overflow invert	319.54 m

Provision has been made in the pumping station piping for the installation of an additional pump in the future.

The pump discharge consists of a 150 mm diameter main and is equipped with a check valve and a gate valve. It connects to a 200 mm diameter PVC forcemain outside the pumping station. Flow monitoring equipment is not provided at the pumping station except for the hour meter which records the run time of each pump.

A 100 kW diesel generator set complete with an automatic transfer switch is provided at the sewage treatment plant to supply standby power to the treatment plant as well as to Pumping Station No. 1.

Sewage from the pumping station is pumped to the grit channels at the sewage treatment plant through a 200 mm diameter forcemain approximately 230 m in length.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

The pumping station is operating satisfactorily and appeared to be in good condition when inspected on August 6, 1987.

3.3.2.2 Pumping Station No. 2

Sanitary sewers from the contributory area north of the Drag River drain into Pumping Station No. 2 which is located near the junction of Victoria Street and Maple Avenue.

The station consists of a 2.4 m diameter precast concrete submersible pumping station 6.9 m deep. It contains two Flygt Model CP 3101 submersible sewage pumps, each rated at 18 L/s against a TDH of 12.2 m and equipped with a 3.7 kW submersible electric motor. The discharge pipe for each pump is 150 mm in diameter and has a check valve and a gate valve. The station is provided with an emergency overflow.

The pumps are controlled by float regulators suspended in the wet well which are set for automatic operation as follows:

Pump Station floor elevation	312.55 m
Stop both pumps	313.10 m
Start lead pump	313.72 m
Start lag pump	314.33 m
Alarm level	314.63 m
Emergency overflow invert	318.60 m

A 25 kW Stamford diesel generator set with an automatic transfer switch is provided in a separate building near the pumping station to supply standby power to the station.

Sewage from the station is pumped through a 150 mm diameter PVC forcemain approximately 245 m long to a sanitary manhole located at the junction of York Street and Maple Avenue.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

3.3.2.3 Pumping Station No. 3

Pumping Station No. 3 is located at the east end of Highlandwood Drive near the Red Cross Hospital.

The station consists of a 2.4 m diameter precast concrete submersible pumping station 5.64 m deep. It contains two Midlands submersible sewage pumps, each rated at 8.2 L/s against a TDH of 14.3 m and equipped with a 3.7 kW submersible electric motor. The discharge pipe of each pump is 100 mm in diameter and has a check valve and a gate valve.

The pumps are controlled by float regulators suspended in the wet well which are set for automatic operation as follows:

Pump Station floor elevation	315.40 m
Stop both pumps	315.95 m
Start lead pump	316.31 m
Start lag pump	316.61 m
Alarm level	317.83 m

This station is not provided with an emergency overflow nor with standby power.

Sewage from the station is pumped through a 100 mm diameter PE forcemain 419 m long to a sanitary manhole near the Haliburton County High School.

3.3.2.4 Pumping Station No. 4

Pumping Station No. 4 is located on the west bank of the Drag River near the junction of South Street and Highway 121.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

The station consists of a 2.4 m diameter precast concrete submersible pumping station 6.0 m deep. It contains two Midlands submersible sewage pumps, each rated at 10 L/s against a TDH of 10.4 m and equipped with a 3.7 kW submersible electric motor. The discharge pipe of each pump is 100 mm in diameter and has a check valve and a gate valve.

The pumps are controlled by float regulators suspended in the wet well which are set for automatic operation as follows:

Pump Station floor elevation	321.80 m
Stop both pumps	322.36 m
Start lead pump	322.98 m
Start lag pump	323.60 m
Alarm level	323.93 m
Emergency overflow invert	326.29 m

This station does not have standby power.

Sewage from the station is pumped through a 100 mm diameter PVC forcemain 185 m long to a sanitary manhole located at the junction of Mountain Street and Highway 121.

3.3.3 Sewage Treatment Plant

The sewage treatment plant is located on the north side of the Haliburton County High School as shown in Figure No. 3.1. The plant was constructed in 1975 and was originally designed to operate as an extended aeration process with a capacity of 455 m^3/d for a population of 1,000 persons.

In the design, provisions were made to allow conversion of the plant to a contact stabilization process with a capacity of 955 m^3/d for a population of 2,100 persons. Since the initial plant design, the MOE quidelines have become more stringent such that the afore-noted design is no longer acceptable.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

The plant is presently operating as an extended aeration process.

The major components of the plant are described below.

3.3.3.1 Grit Channels

Flow from Pumping Station No. 1 is pumped to the two (2) grit channels at the sewage treatment plant. Each channel has the following dimensions:

Length	6.4 m
Width	0.46 m
Maximum liquid depth	0.3 m

The channels are designed for an ultimate peak flow of 40 L/s. One of the two channels can handle this flow at a controlled velocity of 0.3 m/s, as the velocity is controlled by a proportional weir installed at the outlet end of each channel. The grit channels are cleaned manually.

The existing peak flow to the sewage treatment plant is approximately 20 L/s, determined by the pump capacity at Pumping Station No. 1. Therefore, both channels have a reserve capacity of 20 L/s.

3.3.3.2 Process Tank

The process tank is an Infilco Biosorption activated sludge package plant designed to operate initially as an extended aeration process, for an average flow of 455 m^3/d.

The plant is constructed with a reinforced concrete base and steel walls, with an outer wall diameter of 16.16 m and an overall outer wall height of 4.95 m. It is divided into the following compartments:

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

a) Inlet Chamber and Comminutor

Sewage flows by gravity from the grit channels through a 250 mm diameter pipe to the process tank inlet chamber. A 250 mm diameter comminutor is installed at the inlet chamber to continuously screen and comminute solids in the raw sewage. The comminutor was supplied by Cord Industrial Equipment Ltd. and has a capacity of 40 L/s. The comminutor is driven by a 0.7 kW electric motor with power transmission through a vertical reduction gear.

An overflow type of bypass chamber equipped with a bar screen is provided to bypass the comminutor.

b) Aeration Tank

The aeration tank consists of two (2) components, a contact mixing tank and an aeration tank. As mentioned above, the process tank has been designed to function either in the extended aeration mode or in a contact stabilization mode. Piping is arranged in such a way that the flow from the inlet chamber can be directed to either the contact mixing tank through a 250 mm diameter pipe when the plant is operating in the contact stabilization mode, or through a 150 mm diameter pipe to the inlet of the aeration tank when the plant is operating in extended aeration mode. A 250 mm diameter transfer pipe is provided between the aeration and the contact mixing tanks.

The contact mixing tank has a liquid retaining volume of 109 m^3 and the aeration tank has a capacity of 327 m^3.

Air is supplied to the contact mixing tank through four (4) groups of fine bubble diffusers. Each group has four (4) diffusers and is supplied from a 150 mm diameter air header via a 38 mm diameter drop pipe.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

Liquid from the contact tank is conveyed to the centre stilling well of the clarifier through a 250 mm diameter pipe.

A 200 mm diameter sludge return pipe is installed between the central sludge well of the settling tank and the inlet end of the aeration tank to return sludge continuously by means of an air lift, the discharge is controlled by a ball valve in the air feed line.

Excess sludge from the aeration tank can be transferred to the aerobic digester through an air lift.

c) Settling Tank

An 8.54 m diameter settling tank is provided in the central area of the process tank.

The settling tank has a central inlet well and a peripheral effluent trough with an adjustable weir plate. The weir plate has 38 mm Vee notches equally spaced around the periphery of the trough and is provided with a sludge and scum removal mechanism. The sludge collector is suspended from the bridge and includes a 0.37 kW electric motor with a speed reducing mechanism, drive shaft and scraper arms with adjustable flights.

The settled sludge is moved continuously across the floor of the tank to the central sludge well. The sludge is then returned continuously to the aeration tank by means of an air lift as previously described.

The sludge collector shaft also drives a surface skimmer which moves the scum trough and ejector and is controlled by a mechanically operated air valve activated by the skimmer. The ejector discharges the scum into the sludge holding tank.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

The settling tank has a surface area of 57.2 m^2 and was designed for a surface settling rate of 0.19 $L/m^2/s$ at an average flow rate of 955 m^3/d. According to the present MOE guidelines, the maximum allowable settling rate with phosphorus removal is 0.41 $L/m^2/s$ at the peak flow rate. At present, the peak flow rate to the plant is approximately 20 L/s based on the capacity of Pumping Station No. 1. Thus, the current surface settling rate of the tank is 0.35 $L/m^2/s$.

d) Aerobic Digesters and Sludge Holding Tank

Two aerobic digesters and a sludge holding tank are provided in the plant for the digestion and storage of the waste sludge before it is hauled away for disposal. The capacities of the tanks are as follows:

Stage 1 digester - 111 m^3
Stage 2 digester - 83 m^3
Sludge holding tank - 28 m^3

The Stage 1 digester is provided with three (3) groups of air diffusers, the Stage 2 digester is provided with two (2) groups of air diffusers and the holding tank is provided with one (1) group of air diffusers. Each group includes four (4) fine bubble diffusers and is supplied with air in the same way as in the aeration tanks.

e) Chlorine Contact Tank

The chlorine contact tank is provided at the outlet end of the process tank. It has a liquid retaining capacity of approximately 20 m^3 and was designed to provide a retention time of 30 minutes at a design flow rate of 955 m^3/d.

A V-notch weir is provided at the outlet of the chlorine contact tank to meter the effluent being discharged from the plant. Flow measuring equipment includes an electronic level transmitter located at the process tank and a recorder/totalizer installed in the control building.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

3.3.3.3 Filter Beds

Two (2) open filters, each with a surface area of 117 m^2, polish the effluent of the process tank before it is discharged to the Drag River.

The filter beds were designed for seasonal operation at an average flow rate of 455 m^3/d. The filter media consists of the following layers of granular material.

600 mm of sand passing 6 mm sieve
75 mm of sand, 0.8-1.2 mm in size
150 mm of gravel 3 mm - 25 mm in size

The underdrainage system consists of 100 mm diameter perforated V.C. pipe laid at 0.9 m centres. The 100 mm diameter pipes are connected to a 150 mm diameter perforated V.C. pipe header leading to a 250 mm diameter outlet pipe. All the pipes are laid at a slope of 1.25%.

The inlet chamber is designed to distribute flow to any one or both of the filters or to bypass the filters entirely.

Information obtained from plant operating staff indicated that the filters became plugged and were required to replace sand in 1986. However, the replaced sand was unsuitable and requires changing again. Consequently, the filters were removed from service. OPERATING 1990 VACUUM

3.3.3.4 Outlet Sewer

A 300 mm diameter outlet sewer from the filter beds to Drag River consist of the following sections:

a) 38.6 m sewer at 0.43% slope between filter bed outlet structure to MH No. 1.
b) 29.6 m sewer at 21.0% slope between MH No. 1 to MH No. 2.
c) 32.3 m sewer at 3.3% slope between MH No. 2 to the end of sewer in Drag River

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

The capacity of the sewer between the filter bed outlet structure to MH No. 1 is approximately 66.2 L/s. However, a sewer drop of approximately 1.5 m is provided in MH No. 1. Therefore, the capacity of this section of sewer could be increased by deepening the sewer.

The capacity of the sewer from MH No. 1 to Drag River, based on the available head of 6.4 m between MH No. 1 and the maximum river liquid level of 318.3 m, is calculated to be approximately 320 L/s.

3.3.3.5 Control Building

The control building includes the following facilities:

- Office and laboratory
- Washroom
- Storage room
- Chlorine room
- Standby power room
- Chemical storage and metering facilities
- Blower room which also includes process water pumps
- Sewage Pumping Station

Electrical controls for the plant and effluent flow recorder are installed in the office and laboratory.

A brief description of the main equipment installed in the control building is as follows:

a) Diesel Generator Set

The diesel generating set consists of a Ruston Model LE heavy duty, water cooled diesel engine driven generating set, having a continuous rating of 100 kW (125 kVa) at a 0.8 power factor. The set includes a

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

Dorman Model 6L.F diesel engine and a Stamford Model C40A generator operating at a speed of 18 rpm. The installation complies with the MOE Specifications and is equipped with a 200 amp Westinghouse Robonic Model RO 512 transfer switch.

Information obtained from the plant operation staff indicates that the generating set is in good condition and is operated for approximately 30 minutes every week.

b) Chlorination Equipment

The chlorination equipment consists of a Wallace and Tiernan Series A-741 gas chlorinator. It is a wall mounted, manually operated, vacuum type unit having a capacity of 90 kilograms per day. The unit is supplied with a 34 kilograms per day rotameter.

c) Process Water Pumps

The process water pumps consist of Weinman Model 4 AEK-86 pumps rated at 1.9 L/s at 38 m TDH. Two pumps have been installed in the blower room but one of them serves as a standby.

d) Ferric Chloride Storage Tank and Metering Pumps

The lower floor of the Control Building houses a 27.3 m^3 tank for the storage of ferric chloride solution.

Two (2) BIF Model 1731 chemical metering pumps, each with a capacity of 57 litres per hour against a pressure of 340 kPa and equipped with an SCR drive unit, are used for feeding ferric chloride for phosphorus removal. Ferric chloride is injected at the inlet chamber of the process tank and is proportional to the effluent flow.

Two (2) metering pumps have been provided, one of which is utilized while the other is kept as a standby unit.

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

e) Air Blowers

The blower room houses three (3) Sutrobuilt Model 6MB air blowers rated at 106 L/s (225 cfm) at a pressure of 47 kN/m^2 (7 psi) when operating at 900 rpm. Each air blower is driven by an 11 kW electric motor operating at 1750 rpm.

Two (2) blowers are used continuously while the third one serves as a standby unit.

3.3.3.6 Plant Allowable Capacity

Based on the evaluation of the plant allowable capacity as outlined in the Phase 1 and 2 report, it is concluded that the existing Haliburton sewage treatment plant be operated on the extended aeration process with a rated capacity of 542 m^3/d.

The average daily flow recorded at the sewage treatment plant during 1987 was 317 m^3/d. With a rated plant capacity of 542 m^3/d, the plant has a reserve capacity of approximately 225 m^3/d.

3.4 Existing Sewage Systems for Commercial and Resort Properties

3.4.1 General

The following inventory of existing sewage systems for the commercial and resort properties to be serviced by the proposed Haliburton Kashagawigamog Sewer Extension was obtained from Rysco Engineering Corporation, designers of the sewer extension.

542
225
10840
1084
11924
gpd

check these with mine

3.4 Existing Sewage Systems for Commercial and Resort Properties (Cont'd)

3.4.2 Existing Sewage Systems for Commercial Properties

The following is a brief summary of the existing sewage systems for the properties in the commercial sector west of the Hamlet of Haliburton:

a)	Driftwood Restaurant	- holding tanks, pumped out as required
b)	Haliburton Lumber	- holding tanks, pumped out as required
c)	Haliburton Marine	- small septic tanks and tile field
d)	Brewers Retail and Skyline Automotive	- small septic tank and leaching field
e)	Curry Motors Body Shop	- small septic tank and small tile bed serving washrooms only
f)	Kashaga Ford	- holding tanks, pumped out as required
g)	Haliburton Truck Service	- holding tanks, pumped out as required serving one bathroom
h)	Floyd Hall Real Estate	- small septic tank and tile bed (very old system)
i)	Brooklin	- holding tanks, pumped out as required serving one bathroom

3.4.3 Existing Sewage Systems for Resort Properties

The following is a brief summary outlining the existing sewage systems for the resorts to be served by the proposed sewer extension:

a)	Old Apple Tree Resort	- series of septic tanks and tile beds scattered through the resort property
b)	Lakeview Motel	- proprietary aerobic (Aquarobic) and small tile bed
c)	Langdon Apartments	- septic tank and two tile beds

3.3 Existing Haliburton Sewage System Servicing Conditions (Cont'd)

d)	Pine Stone Inn	- central gravity collection system with raw sewage pump and forcemain to three lagoons; disposal by spray irrigation on forested lands and golf course
e)	Highland Hills Estate	- vacant land not served
f)	Old Slipper Property	- no service
g)	Silver Beach	- central collection system; septic tank treatment and leaching bed
h)	Locarno Lodge	- series of septic tanks and leaching beds scattered through the resort property
i)	Wigamog Inn	- series of septic tanks and leaching beds through the resort property
j)	Willow Beach Cottages	- series of septic tanks and leaching beds scattered through the resort property
k)	Deer Lodge	- septic tank and leaching beds