Grand Bend Sewage Treatment Facility Expansion & Upgrade

Environmental Study Report
March 2009

Municipalities of Lambton Shores, South Huron, and Bluewater

Project No. 07-8597

Submitted by

Dillon Consulting Limited

GRAND BEND SEWAGE TREATMENT FACILITY (STF)
EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Notice of Completion

The Municipalities of Lambton Shores, South Huron and Bluewater have completed a Class Environmental Assessment (EA) and Preliminary Design of the proposed expansion and upgrade of the Grand Bend STF to a mechanical sewage treatment plant.

Study Area

Grand Bend STF

The *Grand Bend and Area Sewage Servicing Master Plan* (2006), completed according to the requirements of the Municipal Class Environmental Assessment, identified the expansion and upgrade of the Grand Bend STF to a mechanical treatment plant as the preferred solution for meeting the Service Area's immediate and future sewage treatment needs. The Class EA of the expansion and upgrade of the Grand Bend STF followed the requirements of the Municipal Class EA for a Schedule "C" project.

The Class EA confirmed the Master Plan's recommendation to upgrade and expand the Grand Bend STF from a lagoon system to a mechanical treatment plant. The preferred design meets existing and future servicing needs in a timely and cost-effective manner, is environmentally sound and allows future growth in the Study Area.

The preferred design includes a mechanical treatment plant using the Biological Nutrient Removal Oxidation Ditch system, an aerated sludge lagoon and a sludge containment wetland. The plant incorporates sustainable design concepts, such as an effluent heat recovery system.

The Class EA process is documented in an Environmental Study Report (ESR). A copy of the ESR is available for a 30 day review period from **March 12 to April 10, 2009,** at the following locations:

Municipality of Lambton Shores
4 Ontario Street
Grand Bend, ON N0M 1T0
Tel: 519-238-8461 or 1-866-295-8232
Hours: Mon – Fri 8:30 a.m. – 4:30 p.m.

Grand Bend Public Library
15 Gill Road
Grand Bend, ON N0M 1T0
Tel: 519-238-2067
Hours: Mon – Sat 9:00 a.m. – 2:00 p.m.
Wed &, Sat 7:00 p.m. – 9:00 p.m.

Municipality of South Huron
322 Main Street South
Exeter, ON N0M 1S6
Tel: 519-235-0310 or 1-877-204-0747
Hours: Mon – Fri 8:00 a.m. – 5:00 p.m.

Municipality of Bluewater
14 Mill Avenue
Zurich, ON N0M 2T0
Tel: 519-236-4351
Hours: Mon – Fri 9:00 a.m. – 4:30 p.m.

The Municipal Class EA entitles any person who has significant concerns about the project to request the Minister of the Environment to issue a Part II Order to change the status of the project from a Class EA to an individual environmental assessment. The procedure for requesting a Part II Order is:

- first, the person with concerns discusses them with the municipality
- if the concerns cannot be resolved, the person may submit a written request for a Part II Order to the Minister of the Environment at 135 St. Clair Avenue West, 12th Floor, Toronto, Ontario, M4V 1P5 by **April 10, 2009** copied to:

Peggy Van Mierlo-West
Director of Community Services
Municipality of Lambton Shores
9575 Port Franks Road
R.R. 1, Thedford, Ontario
N0M 2N0
Tel: 519-243-1400
Fax: 519-243-3500
E-mail: pvmwest@lambtonshores.ca

Janet Smolders, MCIP
Dillon Consulting Limited
Box 426, London, Ontario
N6A 4W7
Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

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1. INTRODUCTION

1.1 Background

The *Grand Bend and Area Sanitary Sewage Master Plan* (February 2006), completed by Dillon Consulting Limited for the Municipalities of Lambton Shores, South Huron and Bluewater, is a comprehensive, long-range document outlining sanitary sewage infrastructure improvements required to the year 2026. The Master Plan was completed according to the requirements of the "Municipal Class Environmental Assessment (EA)" (June 2000) for Master Plans. As shown on **Figure 1**, the Study Area consisted of a large area in the three municipalities extending along the Lake Huron shoreline from the Ausable River "Cut" to Huron Road 84, including the hamlet of Dashwood. The goal of the Master Plan was to identify a long-term, environmentally and economically sustainable servicing scheme to meet the servicing needs of existing and future development in the Study Area over the next 20 years.

Phase 1 of the Master Plan, "Problem/Opportunity Identification", concluded that malfunctioning septic systems in the Study Area, as well as discharges from the Grand Bend Sewage Treatment Facility (STF), are adversely affecting surface and groundwater, including Lake Huron, the area's most important natural and recreational asset. Septic system malfunction rates are expected to be high over the next 20 years. In addition, currently proposed and future growth must be serviced by municipal sanitary sewage services to comply with provincial environmental protection policies. Phase 2, "Alternative Solutions", identified and evaluated alternative solutions to these problems. Public and agency consultation occurred throughout the project and was incorporated into Phases 1 and 2 of the Master Plan process.

The preferred sanitary sewage servicing solution chosen by the three municipalities for the Master Plan consists of the following components in order of priority. Some of the solutions are currently being implemented:

- Provide municipal sanitary sewage services to the entire Study Area, phased in over the next 20 years.
- An expansion and upgrade of the Grand Bend STF was identified as the preferred solution for meeting the immediate and future sewage treatment needs of the Study Area and improving effluent quality.

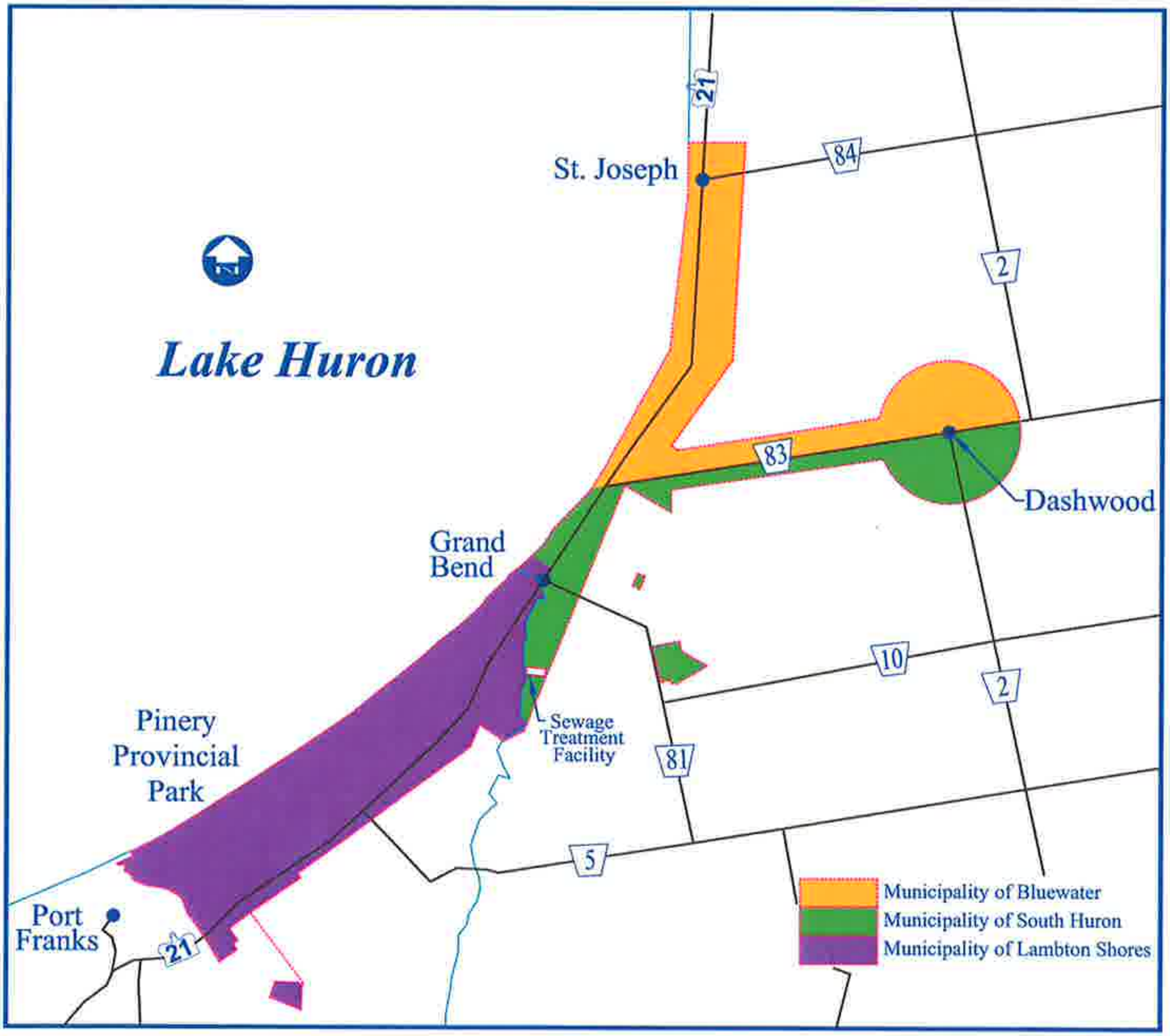
- Construction of the North Lambton Shores Pressure Sewer along Goosemarsh Line to service an area designated as "Zone 4". The Zone 4 Service Area includes Pinery Provincial Park, the proposed Southbend Estates development, residential subdivisions and other development along Highway 21 from the Ausable River Cut to the Grand Bend STF. The pressure sewer was approved under the *Environmental Assessment Act* in 2008 and is scheduled for construction by Lambton Shores in 2009. The timing of construction of sewers in the subdivisions in Zone 4 (including Van Dongen, Dalton, Deer Run, Walker Woods, Oak Forest Estates, Walden North and Defore) will be determined by the Municipality of Lambton Shores.

- Construction of the South Grand Bend ("Zone 3") Sanitary Sewage Collection System to service existing and future subdivisions in the southern portion of Grand Bend. The Class EA and Preliminary Design study has been initiated by Lambton Shores and is currently underway. The potential Service Area for Zone 3 includes Southcott Pines, Beach O'Pines, Merrywoods, Pinedale, Huron Woods, Wee Lake Estates and Pinetree/Riverview Drive. The timing of construction has yet to be determined by the Municipality of Lambton Shores.

- Construction of a collection system to service lands in South Huron, from north of Grand Bend to Huron Road 83 (referred to as "Zone 2"). This area includes Oakwood Park and Maplegrove, Sunnyside and Kingsmere Cottages. The required Class EA and Preliminary Design study has yet to be initiated by the Municipality of South Huron.

- Construction of a collection system to service the many subdivisions located along the Bluewater lakeshore north of Huron Road 83, including the hamlet of St. Joseph (referred to as "Zone 1"). The Municipality of Bluewater has yet to initiate the required Class EA and Preliminary Design study.

- Construction of a collection system to service the hamlet of Dashwood. Dashwood is located in South Huron and Bluewater. South Huron and Bluewater have yet to initiate the required Class EA and Preliminary Design Study.



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Grand Bend Sewage Treatment Facility Expansion and Upgrade Class Environmental Assessment

FIGURE 1: STUDY AREA

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

1.2 Purpose of ESR and Study Area

Dillon was retained by the Municipalities of Lambton Shores, South Huron and Bluewater to prepare a Class EA and Preliminary Design of the Expansion and Upgrade of the Grand Bend STF. The Class EA followed the requirements of the "Municipal Class EA" (June 2000, amended in 2007) for a Schedule "C" project. This Environmental Study Report (ESR) documents the decision-making process leading to the decision to expand and upgrade the Grand Bend Sewage Treatment Facility (STF) to a Mechanical Sewage Treatment Plant with onsite sludge management.

The Study Area for the project is the same as the Study Area for the 2006 Master Plan. The Study Area (**Figure 1**) includes the following serviced and un-serviced areas:

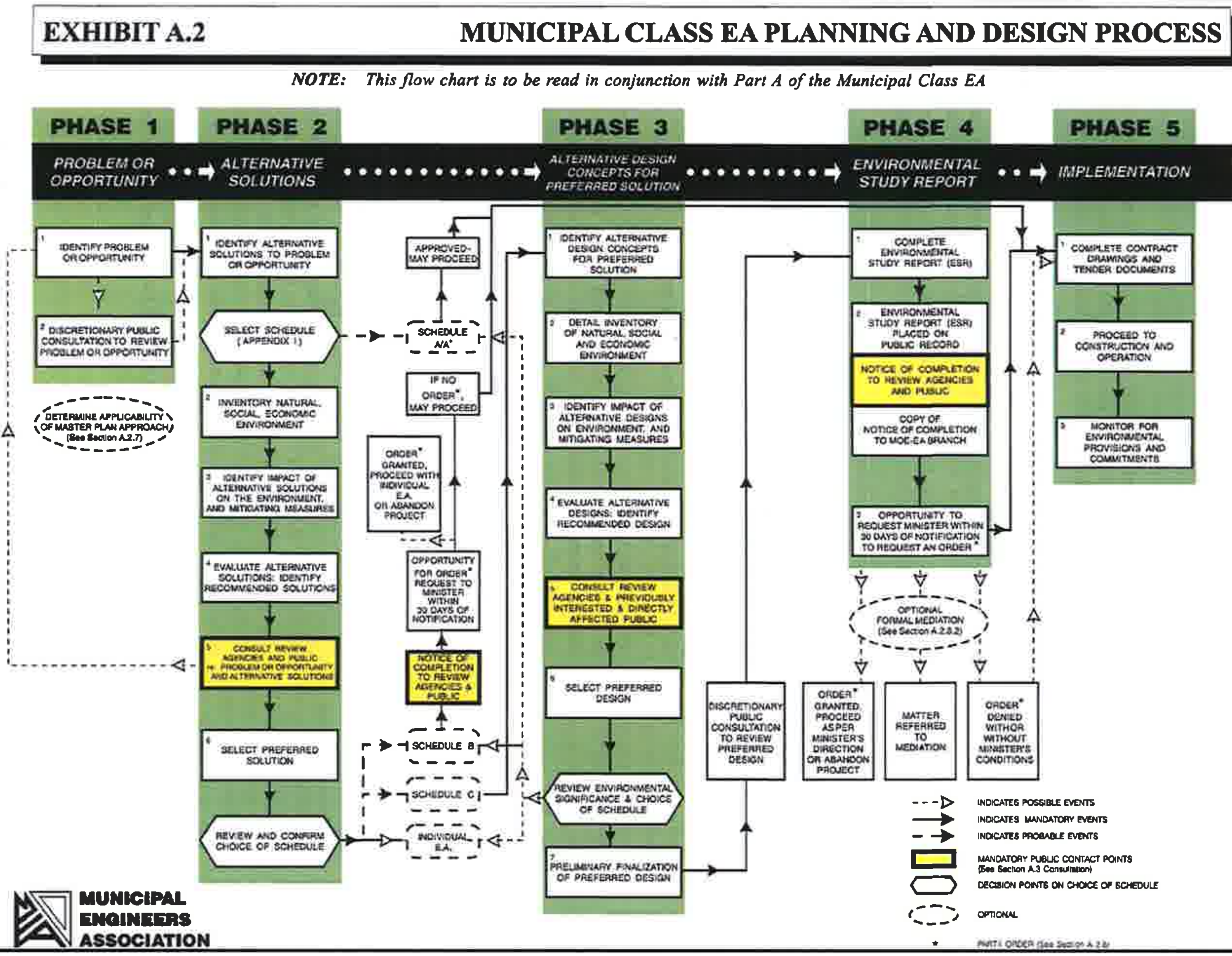
Current Service Area

- Lambton Shores: the urbanized portion of the former Village of Grand Bend
- South Huron: major uses on Highway 21 and Huron Road 81, including Grand Cove Estates, Oakwood Resort, Oakwood Links Condominiums, Huron Country Playhouse, Grand Bend Motorplex and the Pickling Onion Growers (POG) Plant.

Un-Serviced Area

- Lambton Shores: lands along both sides of Highway 21 from the former Village of Grand Bend south to the Ausable River Cut, including Pinery Provincial Park
- South Huron: lands along both sides of Highway 21 from the Grand Bend boundary to the Bluewater boundary (Highway 83) and the southern portion of the hamlet of Dashwood
- Bluewater: lands along both sides of Highway 21 from Huron Road 83 to Huron Road 84, including the many subdivisions along the lakeshore and the hamlet of St. Joseph. The Bluewater portion of the Study Area also includes the northern portion of Dashwood.

The Study Area includes lands potentially serviced over the long-term (20+ years) by the expanded and upgraded Grand Bend STF. The Service Area for the expanded and upgraded STF will be further refined as the individual Class EA projects proceed for the required collection systems.



Grand Bend Sewage Treatment Facility Expansion and Upgrade Class Environmental Assessment

FIGURE 2: MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT PROCESS

1.3 Class Environmental Assessment

Municipal sanitary sewage projects must meet the requirements of the Ontario *Environmental Assessment (EA) Act*. The Municipal Class EA applies to a group or "class" of municipal water, wastewater and roads projects which occur frequently and have relatively minor and predictable impacts. These projects are approved under the *EA Act*, as long as they are planned, designed and constructed according to the requirements of the Class EA document.

The specific requirements of the Class EA for a particular project depend on the type of project, its complexity and the significance of environmental impacts. Three categories of projects are identified in the document, including Schedule "A", "B" and "C" projects. The proposed expansion and upgrade of the Grand Bend STF is a Schedule "C" project. This type of project is the most complex and has the potential for significant environmental impacts. Schedule "C" projects are subject to the full Class EA process, as shown on **Figure 2**, and require extensive public and agency consultation.

Dillon's Class EA consisted of the following major activities:

Phases 1 and 2 Update – Review of Preferred Servicing Solution
The Grand Bend and Area Master Plan covered Phases 1, "Problem/Opportunity Identification" and 2, "Alternative Solutions", of the Class EA process. The expansion and upgrade of the Grand Bend STF, from a lagoon system to a mechanical treatment plant, was identified as the preferred solution to meet the Study Area's immediate and future treatment needs and improve effluent quality.

To confirm the preferred solution, Dillon's Phases 1 and 2 Update reviewed the information, assumptions and servicing and treatment alternatives outlined in the Master Plan. The following work was completed and is documented in Sections 2, 3 and 4 of this ESR:

- Update the population projections included in the Master Plan, based on census trends and current development activity in the Study Area
- Consider any relevant studies completed or new legislation enacted since the Master Plan was completed in 2006
- Confirm future design loads for the facility, based on hydraulic flowrates and contaminant loadings, including industrial sources

- Confirm the costs and benefits of expanding and upgrading the existing plant
- Review the suitability of the existing site with respect to servicing needs and confirm that the existing site is the preferred location for an upgraded facility
- Confirm and modify, if necessary, the servicing/treatment solution recommended by the Master Plan.

Phase 3, "Design Options"

Focused on the objective of determining the best method of implementing the preferred solution, Phase 3 consisted of the identification and evaluation of design options for the STF expansion and upgrade, including options for sludge management and treatment. Existing and projected environmental conditions potentially affected by the design options are described in Section 3. Section 4 includes an evaluation of the various design options developed for expanding and upgrading the STF.

Public and agency consultation occurred throughout Phase 3, as summarized in Section 5. Public Information Centres were held on July 15 in Grand Bend and August 16, 2008, in Dashwood.

A preferred design was chosen at the end of Phase 3. Section 6 of the ESR describes the preferred design and includes an impact assessment and mitigating measures. Capital and operating costs are also included in Section 6.

Phase 4, Environmental Study Report (ESR)

Phase 4 consisted of the preparation of this ESR, including a pre-design of the preferred design. The ESR will be placed on the "public record" for a 30-day review period.

2. GRAND BEND & AREA SANITARY SEWAGE SERVICING MASTER PLAN REVIEW AND UPDATE

2.1 MOE Review of 2006 Master Plan

The 30-day public and agency review period for the Master Plan extended from February 27 to March 29, 2006. During the public review period, two Part II Order Requests were received:

- A resident of Port Franks stated that the Master Plan did not adequately address long-term archaeological impacts
- A resident of the Deer Run Subdivision requested that the Municipalities consider an engineered wetland as the preferred servicing solution since, in the resident's opinion, it is more ecologically acceptable and less expensive for the Municipalities and homeowners. The Part II Order requestor also objected to the proposed low pressure sanitary sewage collection system because the pumps rely on electricity.

By letter dated August 15, 2007, MOE concluded that the requests were premature since the Master Plan only provides a broad level of assessment and projects identified in the Master Plan will be further evaluated through the Class EA process.

The three Municipalities committed to continue to address the issues raised by the requesters in the subsequent Class EA's of the projects identified in the Master Plan. In addition, MOE expects that the subsequent Class EA's will:

- Document the current uses, water quality conditions and aquatic life in the area of the Grand Bend STF and verify that the proposed effluent criteria will protect current uses and aquatic life in the area
- Reference all relevant cultural resource surveys for the Study Area in the archaeological assessment studies conducted as part of the subsequent Class EA's
- Prepare detailed per household cost estimates for all planned projects
- Evaluate the feasibility of using the Thedford Marsh as an engineered wetland to treat effluent from the Pinery Park and Southbend Estates.

2.2 Phase 1, "Problem/Opportunity Identification" Update

2.2.1 New Legislation and Recent Studies

New legislation and relevant studies prepared since the 2006 Master Plan include the following:

***Ontario Clean Water Act, 2006* and *Building Code Act* Amendments**

The *Clean Water Act (CWA)* (2006) was passed by the Ontario legislature after the Master Plan was prepared in 2006. The *CWA* introduces a new level of protection for Ontario's drinking water resources that will assist communities across the Province to enjoy a safe and plentiful supply of water for generations to come. Although the act primarily focuses on drinking water, it will benefit the water's ecological and recreational value. The legislation requires communities to protect their municipal drinking water supplies by creating multi-stakeholder committees to develop collaborative, locally driven, science-based Source Protection Plans. The Source Protection Committees will identify potential risks to local water sources and actions to be taken to reduce or eliminate these risks.

The *CWA* includes amendments to the *Building Code Act*, 1992, concerning maintenance inspection programs for on-site sewage systems. The amendments authorize programs to enforce the Building Code's standards for the maintenance and operation of existing sewage systems, and require that the programs be enforced by municipalities or other onsite sewage system "regulators". Required maintenance inspection programs will apply to sewage systems located in "vulnerable areas", based on an assessment report included in the Source Protection Plan. Once the Terms of Reference are finalized, a Source Protection Plan will be developed by the Source Protection Committee for the Ausable Bayfield Maitland Valley Source Protection Area. A large portion of the Lambton Shores Study Area was identified as "highly susceptible" to groundwater contamination in the 2005 Lambton County Groundwater Study.

The Building Code requirements for on-site sewage system maintenance inspection programs are proposed to come into force on January 1, 2009. The mandatory maintenance inspection programs will not be in force until a Source Protection Plan is approved for a given area. These plans are anticipated to be submitted to the MOE by 2012. All septic system "regulators" will be required to have a mandatory on-site sewage system maintenance program in place by about 2012, following the approval of the Source Protection Plan. Under this program, regulators will have the power to order that a faulty or failing system be replaced. The Lambton County Building Services Department is the "regulator" of septic systems in Lambton Shores. In Huron County, the Huron County Health Unit, or the local municipality is the "regulator".

Lake Huron Primary Water Supply System, Draft Intake Water Protection Zone, 2008

As required by the *Clean Water Act*, the Lake Huron Primary Water Supply System (LHPWSS) has completed a draft Intake Water Protection Zone delineation for the Lake Huron Water Treatment Plant located north of Grand Bend. The plant serves a population of 325,000. Treated effluent from the Grand Bend STF is discharged to Shipka Drain/Parkhill Creek/Lake Huron. The point of discharge from Parkhill Creek to Lake Huron is within draft Intake Protection Zone 2 (IPZ-2). The Intake Protection Zones may have future implications on various point and non-point sources of potential contamination, including existing septic system discharges. The completion of the delineation of the Intake Water Protection Zones and the subsequent vulnerability and risk assessments are currently on hold, pending further direction from the Province.

Ausable Bayfield Conservation Authority (ABCA), Watershed Report Card, 2007.

The ABCA produces "Watershed Report Cards" for each sub-watershed. The Grand Bend STF discharges to the Shipka Drain, a tributary of Parkhill Creek in the Lower Parkhill watershed. The 2007 Lower Parkhill Report Card indicated that ecosystem conditions, including water quality, in the Lower Parkhill watershed need to be enhanced. The report card included the following marks or grades for water quality in the watershed:

- Phosphorus is an element that enhances plant growth and contributes to excess algae and low oxygen in streams and lakes. The watershed's <u>Total Phosphorus</u> concentration of 0.12 mg/L exceeds MOE's provincial water quality objective of 0.03 mg/L. This provincial water quality objective was set to avoid or eliminate excessive plant growth in rivers and streams. **Grade: C**.
- <u>E. coli</u> (*Escherichia coli*) is a bacteria found in human and animal waste. According to the Report Card, the presence of these bacteria indicates the potential for the water to have other disease-causing organisms. The watershed's E. coli count of 168 exceeds the Ministry of Health's guideline of 100 cfu (colony forming units) per 100 mL for recreational waters. **Grade: C**.
- <u>Benthic organisms</u> are small animals without backbones that live in stream and lake sediments. The Family Biotic Index (FBI) measures the numbers of these animals in a sediment sample, with 1 as healthy and 10 as degraded. The Lower Parkhill Watershed has an FBI of 5.6. **Grade: C**.

Grade C indicates that ecosystem conditions need to be enhanced.

Among the many recommendations to improve water quality, the Report Card recommends that faulty septic systems be fixed and a septic system maintenance plan be established.

County of Huron Onsite Sewage System Re-Inspection Report, April 2008.

As recommended by the Huron County Groundwater Study (2003), the Huron County Health Unit completed a voluntary onsite septic system re-inspection pilot program from 2005-2007. During the first two years of the program, 25% of the septic systems inspected were found to have maintenance issues. In 2007, the Health Unit started to inspect the interior of septic tanks and the percentage of septic systems with maintenance issues increased from 25% to 38%. The program's other findings included:

- the number septic tanks requiring pumping has increased
- small increase in permits for the replacement of sewage system
- lakeshore properties have been converted from seasonal to year-round use without increasing sewage system capacity
- properties have been renovated with additional bedrooms and bathrooms without increasing sewage system capacity
- most of the property owner's water conservation initiatives were intended to reduce stress on their fragile sewage systems.

The report recommended a mandatory onsite sewage system maintenance program to ensure that existing systems are properly maintained and operated by property owners. All septic system regulators, such as the Huron County Health Unit, must have a Septic System Maintenance Program in place by about 2012, as required by the *Clean Water Act* and the *Building Code Act* amendments.

ABCA, A Management Plan for the Old Ausable Channel Watershed, April 2008

A disconnected portion of the Ausable River, the Old Ausable Channel runs southerly from Grand Bend to the Ausable River Cut at Port Franks. The ABCA Old Ausable Channel (OAC) Management Plan is intended to protect and enhance hydrology, attributes of succession, water quality, aquatic and terrestrial flora and fauna, tourism, recreation and land use and development. The OAC sub-watershed includes a globally significant oak savanna forest ecosystem along the channel and many Species at Risk, including fish (three species), insects, reptiles, birds and one mammal (Southern Flying Squirrel). It has been designated as an Environmentally Significant Area (ESA) by the ABCA.

The Management Plan summarizes surface water samples taken from the OAC in 2006 and 2007 by ABCA, as shown on **Table 1**. Water was tested for E. coli and nutrients, such as Total Phosphorus (TP), Dissolved Phosphorus, Nitrate-Nitrite, ammonia and Total Kjeldahl Nitrogen (TKN). Only TP and E.coli have been analyzed to date. As shown on **Table 1**, concentrations of TP at some locations meet the Provincial guideline and E.coli is below the Provincial guideline.

Table 1: Water Quality Data in the OAC

Site	Total Phosphorus mg/L (Provincial Guideline: 0.03 mg/L)	E. coli CFU/100mL (Provincial Guideline: 100 CFU/100mL)
Pinery 2006 (9 samples)	0.01	4.87
Pinery 2007 (9 samples)	0.02	2.69
Huron Woods Neighbourhood 2007 (9 samples)	0.03	6.93
All samples collected in 2006 and 2007	0.02	4.49
Ausable Bayfield area streams	0.08	233

(Reproduced from Table 1 – ABCA Management Plan for the Old Ausable Channel Watershed, 2008)

The Management Plan indicates that not enough consecutive long-term water quality data has been collected upstream and downstream of the Pinery dam. Although the most recent data indicates water quality is good, there is insufficient data to draw any conclusions. Overall, however, the Management Plan concludes that, relative to the rest of the Ausable River watershed, water quality in the OAC is good because it is isolated from the rest of the main river. As a result, it is much less turbid and nutrient rich than the river.

Groundwater is an important source of water for the Old Ausable River Channel. According to the Management Plan, the quality of water in the OAC is <u>susceptible to contamination from the subdivisions and commercial uses</u> bordering the channel. Studies (Steinbachs 1999) indicated that this development "is possibly a minor source of contamination to the OAC in the form of <u>septic effluent and nutrients</u>". These sources may be entering the river channel via groundwater recharge.

The Management Plan's other relevant conclusions and recommendations are:

- education programs should be provided on septic system maintenance. The report states that until municipal sewers are provided, it must be ensured that septic systems are not posing a threat to water quality
- sediments, nutrients and other potential contaminants from various sources degrade habitat quality and may be especially detrimental to Species at Risk
- since human development threatens the eco-system, there is a need to find a balance between the environment and community.

The Management Plan suggests that there is a general lack of knowledge among local residents regarding possible forms of contamination and recommends educating residents about the importance of having adequate septic systems in good repair. The report also identifies the planned municipal sewer servicing of the area as an important step towards improving water quality in the OAC Watershed.

Lambton Shores Groundwater Monitoring Program

A groundwater monitoring program is being completed by Golder Associates, on behalf of the Municipality of Lambton Shores for the area designated as Zone 3, which includes Southcott Pines, Beach O'Pines, Merrywoods, Pinedale, Huron Woods, Wee Lake Estates and Pinetree/Riverview Drive. The program was initiated in Fall 2008 and preliminary results are expected by Summer 2009. The results of the monitoring program will characterize the water quality of groundwater in the Zone 3 portion of the Study Area.

Other Provincial, County and Local Land Use and Servicing Policies

All other policies have not changed since the Master Plan was prepared in 2006. In summary, these policies are:

- full municipal services are required in "settlement areas"
- partial services (municipal water and septics) are discouraged
- septic systems may service developments of five lots or less, if:
  - full or communal services are not available
  - the system complies with all regulations and protects human health and the environment
  - site conditions are suitable over the long term
  - servicing is based on integrated servicing/land use considerations
- Provincial policies also require that municipalities protect, improve or restore the quality of groundwater and surface water.

2.2.2 Updated Problem Statement

Existing and future development in the Study Area requires short and long-term municipal sanitary sewage treatment improvements, based on the following considerations:

STF approaching rated capacity -

- The Grand Bend STF is approaching its rated capacity of 1,891 m^3/d, especially during the peak season. The annual average day flowrate for the period of 2002-2007 was 850 m^3/d, on average. The monthly average day flowrate is typically the highest during the month of August. The monthly average day flowrate for August was as follows for the past three years:
  - 2005: 1,250 m^3/d
  - 2006: 1,366 m^3/d
  - 2007: 1,428 m^3/d.

Anticipated septic system failures and groundwater impacts -

- More than 70% of the Study Area's total existing (2005) population of 7,110 is serviced by septic systems. With the exception of some recent developments in the Study Area (Huron Woods and Deer Run subdivisions), most of the septic systems in the Study Area are more than 25 years old, whereas conventional systems have a service life of only 20 years. Failure rates are expected to increase as more residences are converted from seasonal to year round use. Also, many of the lots in the Study Area are too small to accommodate new properly sized septic tank and tile bed systems. Based on these considerations, septic system failure rates are expected to be high over the next 20 years.

- One half of the Study Area, generally south of Grand Bend, consists of sandy soils. According to the Lambton County Groundwater Study (2005), these soils are highly susceptible to groundwater contamination from malfunctioning septic systems, due to the surficial sand aquifer. Although septic systems on sandy soils generally work well, too many systems in one area may adversely impact groundwater. Adverse groundwater quality impacts are expected to be confirmed by the results of Lambton Shores on-going Groundwater Quality Monitoring Program.

- Soils north of Grand Bend in South Huron and Bluewater generally consist of clay soils. Tile beds on clay soils are more prone to premature failure and "breakout" of septic effluent, leading some homeowners along the lakeshore to illegally connect leaching beds to surface water drains. Dysfunctional systems may also cause more severe impacts, such as organic nitrogen, ammonia and general organic loading. Recent studies show that *E. coli* contamination of the beach and subsequent beach closures are caused by multiple sources, including agriculture and domestic sewage.

- Conventional septic tank / leaching bed systems "nitrify" nitrogen in the wastewater to nitrate. Nitrates are not readily biodegraded in the environment and are carried along the groundwater flowpath with eventual discharge to surface water, including tributaries of Lake Huron.

Significant population growth, increasing year round population -

- The Master Plan projected that the population of the Study Area will increase to 9,300 by the year 2026. The "ultimate" population of the Study Area (when all lands designated/zoned for development are developed) may reach over 17,000 people. Dillon updated the population projections included in the Master Plan to the year 2013, as summarized in Section 3.2 of this ESR.

- An estimated 5,000 to 10,000 tourists visit Grand Bend on an average summer weekend day. Currently, population in the Lambton Shores' portion of the Study Area is approximately 50% year round and 50% seasonal. South Huron's year round/seasonal population split is about one-third/two-thirds and Bluewater's is about 30%/70%. Dashwood's population is estimated to be 100% year round. Year round population in all three municipalities is expected to increase substantially over the next 20 years, based on the type of recent and proposed residential development, the large number of retiring "baby boomers" and the attractiveness of this area for retirement. Based on these trends, year round sanitary sewage servicing solutions are required for the Study Area.

Adverse water quality impacts -

- Aquatic resources in the Study Area are managed by the ABCA under the Authority's Watershed Management Strategy. Water quality indicators for Lower Parkhill Creek exceed Provincial and Canadian water quality guidelines and objectives for E. coli, nitrate-nitrogen, nitrite-nitrogen, and total phosphorus. Effluent from wastewater treatment systems and septic systems are a significant source of nutrient enrichment, phosphorus and bacteria.

- Improving the effluent quality of the Grand Bend STF will improve water quality in Parkhill Creek, which flows to Lake Huron. The point of discharge from Parkhill Creek to Lake Huron is within the draft Intake Protection Zone (IPZ) No. 2 delineation of the LHPWSS Lake Huron Water Treatment Plant, north of Grand Bend. The LHPWSS is currently finalizing the delineation of the Intake Protection Zones.

2.3 Phase 2, "Alternative Solutions" Update

2.3.1 Sanitary Sewage Treatment Alternatives

The Master Plan identified the following five alternatives for providing sanitary sewage treatment to existing and future development in the Study Area:

- Alternative 1: Do Nothing
- Alternative 2: On-Site Tertiary Treatment For Individual Septic Systems ("Effluent Polishing")
- Alternative 3: Discharge to an Adjacent Existing Sewage Treatment Facility:
    - 3A – Discharge to Thedford Lagoons

- 3B – Discharge to Zurich Lagoons
- Alternative 4: New Municipal Sewage Treatment Plant(s):
  - 4A – Stand-Alone Municipal Sewage Treatment Plant for South Huron (including Dashwood)
  - 4B – Stand-Alone Municipal Sewage Treatment Plant for Bluewater
  - 4C – Stand-Alone Municipal Sewage Treatment Plant for Bluewater and South Huron
- Alternative 5: Expansion and Upgrade of Grand Bend STF:
  - 5A – Service Entire Study Area
  - 5B – Service Unserviced Portion of Lambton Shores
  - 5C – Service Unserviced Portion of Lambton Shores and Bluewater
  - 5D – Service Unserviced Portion of Lambton Shores and South Huron.

The Master Plan evaluated these alternatives using broad considerations, such as the ability to service the Study Area, practicality, acceptability to approving agencies, conformity to County, local and Provincial planning and servicing policies and order of magnitude costs.

2.3.2 Updated Evaluation of Alternatives

Alternative 1: Do Nothing

Alternative 1 consists of doing nothing and continuing to service existing and limited future development in the unserviced portion of the Study Area with septic systems over the long term. This alternative is still not feasible based on the following reasons:

- It does not meet the Master Plan's goal of providing a long term environmentally sustainable servicing scheme. It may be suitable in the short-term, however, for newer subdivisions in the Study Area with newer septic systems or developments on larger lots with favourable soil conditions.

- It does not meet Lambton Shore's commitment to provide sanitary sewers for the planned Southbend Estates development and Pinery Provincial Park ("Zone 4"). This project is scheduled for construction in 2009.

- It does not address existing/potential impacts of failed septic systems in the Study Area. Septic system failure rates are expected to be high over the next 20 years.

- "Do Nothing" may not be acceptable following implementation of the Septic System Maintenance Program required under the *Clean Water Act* and the *Building Code Act* amendments beginning in about 2012. In the event that an order to replace an existing septic system is issued, some lots may be too small to accommodate a new, properly sized system.

- New development would be limited to infill only, as restricted by Provincial, County and local municipal land use and servicing policies.

Although some newer subdivisions and existing developments with larger lots and favourable soil conditions may remain on septic systems for now, without posing any significant problems, Alternative 1 is not a feasible long term servicing solution.

If this alternative is selected as the preferred alternative, all three municipalities should consider instituting a comprehensive monitoring program of groundwater and surface water quality to quantify environmental impacts.

Alternative 2: On-Site Tertiary Treatment for Individual Septic Systems

As part of the Phases 1 and 2 Update, Dillon updated the information included in the Master Plan on the EcoFlow, Waterloo Biofilter and FAST Canada systems. Further information regarding these on-site tertiary treatment systems is provided in **Appendix A**. These systems can be phased in as septic systems fail, but only in cases where the system is technically feasible and the lot is large enough to accommodate an area bed and distribution piping.

The reasons included in the Master Plan for rejecting this alternative have been updated and include the following:

- High capital cost for homeowners (approximately $10,000 to $20,000) and on-going maintenance costs (approximately $100 to $400 per year). Capital costs are within the same magnitude of per household cots for a municipal sewage collection system.
- Operating attention and maintenance is required and many systems fail from misuse or lack of maintenance. Effluent quality is not controlled or monitored, so the homeowner may not be aware that the system is not functioning properly.
- Systems require recirculation of flows to achieve nitrification and denitrification for total nitrogen removal. This results in high operating costs compared to a conventional municipal system (gravity or low pressure).
- These systems are complex and include multiple components, including pumps, tanks and media. This increases operating and maintenance requirements and potential system failure.
- Systems may be neglected or misused when home ownership changes. If neglected or misused, the systems may not be able to produce reliable nitrification and the overall nitrogen load to groundwater may increase over time. As a result, these systems may not be able to meet future environmental regulations to protect groundwater quality.
- The systems usually do not remove phosphorus, man-made chemicals or disinfect effluent.
- For the same reasons as septic systems, tertiary systems do not provide a long-term wastewater management solution.

Alternative 3: Discharge to Adjacent Existing Sewage System

Alternatives 3A and 3B consisted of constructing a transfer pipe to convey sewage from the Study Area to Lambton Shore's Thedford Sewage Treatment Facility (STF) (Alternative 3A) or Bluewater's Zurich STF (3B) instead of expanding and upgrading the Grand Bend STF. These alternatives were reviewed as part of the Phases 1 and 2 Update and again rejected for the following reasons:

- the Thedford STF still has insufficient capacity to handle the volume of sewage generated in the Study Area
- Bluewater is still working towards implementing a 2002 Class EA of an upgrading of the Zurich STF, which will service the community of Zurich only.

Alternative 4: New Municipal Sewage Treatment

Alternative 4 consisted of stand-alone new sewage treatment plants to provide full municipal services for South Huron, including Dashwood (Alternative 4A), Bluewater (Alternative 4B) and Bluewater and South Huron (Alternative 4C). All three are capable of providing full municipal services to the Study Area and can be phased in over time.

As part of the Phases 1 and 2 Update, Alternative 4 was reviewed and rejected again for the following reasons:

- high capital, operating and maintenance costs
- a new facility requires property acquisition, potentially causing adverse impacts on cultural resources, natural features and existing and future land uses
- Provincial policy encourages the use of existing infrastructure before developing new infrastructure. MOE policy encourages centralized plants, as opposed to multiple plants. For a regulatory standpoint, one point-source of discharge is easier to manage, operate, and monitor than multiple sewage treatment plants.

The most significant disadvantage of Alternatives 4A, 4B and 4C is the difficulty of siting a new sewage treatment plant due to the lack of suitable discharge points. A new sewage treatment plant must provide effluent quality consistent with MOE guidelines. Potential receiving waters for effluent discharged by new sewage treatment plants include Lake Huron and local watercourses.

The waters of Lake Huron can provide sufficient dilution for treated sewage. The outfall of a new sewage treatment facility could be located to provide significant dispersion of treated sewage away from the beach. However, a lengthy outfall pipe (approximately 2 kilometres) would likely be required. Lake Huron is the Study Area's most important natural and socio-economic asset and is one of Southwestern Ontario's leading tourist attractions. Based on this, the public will have a negative perception of discharging treated sewage to the lake. For these reasons, Lake Huron was rejected as a possible discharge point.

It may be impossible to find another receiving stream in the Study Area that is equally or less sensitive than the current receiver (Shipka Drain/Parkhill Creek), that has sufficient flow, and conforms to land use planning policies for a new municipal STF.

Based on these considerations, both Lake Huron and local watercourses are not suitable discharge points.

Alternative 5: Expansion and Upgrade of the Grand Bend STF

Alternative 5 consists of the expansion and upgrading of the existing Grand Bend STF with the following alternative service areas:

- 5A - services entire Study Area
- 5B - services unserviced portion of Lambton Shores
- 5C - services unserviced portion of Lambton Shores and Bluewater
- 5D - services unserviced portion of Lambton Shores and South Huron.

All four alternatives can be phased in, allowing priority areas to be serviced first. With Alternatives 5B, 5C and 5D, the remaining unserviced areas would continue to be serviced by septic systems (Alternative 1), or, where technically feasible on a lot-by-lot basis, by on-site tertiary treatment systems (Alternative 2). However, since Alternatives 1 and 2 have been rejected as long-term servicing solutions, Alternatives 5B, 5C and 5D are not feasible.

Summary

As a result, the Phases 1 and 2 Update confirmed that the only feasible alternative is Alternative 5A, the expansion and upgrade of the Grand Bend STF to service the entire Study Area. This solution meets existing and future servicing needs in a timely and cost-effective manner, is environmentally sound and allows future growth in the Study Area. In summary, the preferred solution:

- meets the three municipalities' long-term servicing needs
- provides an immediate and long-term environmentally sustainable solution
- conforms to Provincial, County and local land use planning and servicing policies which all require municipal sanitary sewage services for development in settlement areas.

2.4 Thedford Marsh Engineered Wetland

As mentioned in Section 2.1, a Part II Order request on the Master Plan requested that the municipalities consider an engineered wetland on the Thedford Marsh as the preferred solution.

The New Hamburg Process (considered as a Design Option for the expansion and upgrade of the Grand Bend STF) is a modification of the wetland/natural treatment advocated by the Part II Order request.

Dillon examined the feasibility of pursuing an engineered wetland as an alternative to expanding and upgrading the Grand Bend STF as part of the Phases 1 and 2 Update.

Wetland sewage treatment systems have <u>several technical disadvantages</u>. As explained in a paper prepared by C. Zipper, Extension Specialist and Associate Professor of Virginia Polytech Institute and State University, "On-Site Sewage Treatment Alternatives" (August 2003):

> "Although potentially less expensive than other secondary treatment options, wetlands have several disadvantages that make them less desirable for residential use... A major disadvantage of wetland systems is that treatment efficiency varies with weather conditions, as treatment is less effective in colder temperatures. Also because wetland systems must be exposed to the sun and atmosphere in order to operate, there is some potential for children or animals, such as rodents or dogs to become exposed to the untreated effluent if the gravel media is disturbed. If exposed, insects or animals may carry pathogenic organisms to locations where human contact is possible. A physical means (such as chain link fence) of excluding children and large animals from contact with wetland systems should be provided. Some wetland system operators have had success in placing the systems within a greenhouse or similar enclosure to maintain warmer temperatures and for more effective, consistent treatment during the winter months."

Many issues affect the feasibility of using a constructed wetland as an alternative wastewater treatment technology. The Thedford Marsh is a drained wetland used for agriculture. Wetland soils are normally high in organics, quite permeable to water and not suitable for wastewater containment. In order to protect groundwater from contamination by partially treated sewage, the integrity of the treatment lagoons and wetland cells needs to be maintained. This requires the installation of an impermeable liner consisting of clay or an impermeable geotextile designed for this purpose, adding substantial costs to lagoon and wetland construction. Furthermore, peat based soils will not likely provide sufficient stability for constructing berms and flow control structures. This further adds to construction costs since berm construction may require scraping down to soils able to provide support or importing engineered fill.

While treatment wetlands are very effective at BOD and solids removal, they are not effective over the long term for maintaining phosphorus (TP) removal. Once the wetland substrate becomes saturated, its ability to remove phosphorus is dramatically impeded. To achieve 0.3 mg/l of TP on an ongoing basis requires some form of post treatment, either flocculation or absorption of phosphorus with a slag filter. Slag filters have been shown to be effective for 10 years until the media requires replacement or recharging. Current work with slag filters has been on smaller scale facilities. Pilot studies are required to confirm filter performance. Such studies would take about six months to complete and assess, with no guarantee of positive results.

Winter performance of surface flow wetlands and their ability to meet ammonia effluent criteria has been a problem in some wetlands. Sub-surface flow wetlands have had better winter performance; however, they require about 0.7 to 1.0 metres of an aggregate substrate to cover the entire wetland, increasing costs and complexity for a larger scale facility. A further complication is the approval process. While current MOE policy encourages alternative treatment technologies such as wetlands, in practice, approvals for such treatment facilities can be difficult to obtain. Although MOE has permitted smaller scale treatment wetlands, its current approach is to require a backup plan be in place in the event the effluent does not meet discharge criteria. In the case of small wastewater treatment facilities, backup has frequently been to haul effluent to a local municipal treatment plant until compliance can be achieved. This is not practical for a larger facility, making wetland treatment uneconomical.

For example, the Rural Wastewater Centre of Alfred College of the University of Guelph has operated a treatment wetland for polishing lagoon effluent from the Town of Alfred. After several years of monitoring, a Certificate of Approval has yet to be issued by MOE to discharge wetland effluent on a continuous basis to the receiving water, and all effluent is pumped to a lagoon cell prior to discharge.

The use of the Thedford Marsh as an engineered wetland would likely be opposed by the Ministry of Agriculture and Food, County of Lambton and the municipality. The marsh is a Provincially significant specialty crop area, currently used for vegetable farming. The County of Lambton and Lambton Shores Official Plans both designate the Thedford Marsh as a Provincially significant agricultural area with organic soils. According to the Provincial Policy Statement (issued under the *Planning Act* in March 2005), "specialty crop areas will be given the highest priority for protection".

Another issue surrounding the use of the Thedford Marsh as an engineered wetland is the lack of a suitable discharge point. Lake Huron is the Study's Area's most important natural and socio-economic asset and is one of Southwestern Ontario's leading tourist attractions. A lengthy outfall pipe would be required to discharge the treated effluent to Lake Huron. The public will have a negative perception of discharging treated sewage to the lake. Parkhill Creek forms the eastern boundary of the marsh and could be used as a discharge, but only if it is capable of meeting the same stringent effluent criteria as the proposed for a Mechanical Sewage Treatment Plant. Subsurface discharge is also not possible due to potential adverse impacts on groundwater.

An engineered wetland, along with the current septic systems and the planned expansion and upgrade of the Grand Bend STF will result in a "fractured" servicing scheme with three different types of systems serving the area south of Grand Bend. Servicing policies included in the Provincial Policy Statement encourage the use of existing infrastructure (such as the Grand Bend facility), before the development of new infrastructure (like an engineered wetland). In addition, the Province also encourages centralized sewage treatment facilities, as opposed to multiple facilities with multiple discharge points.

3. EXISTING AND PROJECTED CONDITIONS

3.1 Grand Bend Sewage Treatment Facility (STF)

The existing Grand Bend STF and collection system was designed and constructed during the late 1970s. The system became operational in 1980. The existing Service Area includes the urbanized portion of the former Village of Grand Bend and major uses in South Huron on Highway 21 and Huron Road 81.

The Grand Bend STF is located at 70145 Mollard Line, on Lot 6, Aux Sable Concession, in the Municipality of South Huron (formerly Stephen Township). As shown on **Figure 3**, the existing Grand Bend STF comprises four waste stabilization ponds ("lagoons"), without supplemental aeration, that are discharged on a seasonal basis. Wastewater is accumulated in the lagoons with seasonal discharge occurring in the Fall or Winter (October/November/December/January), and in the Spring (April/May/June), over a two to three week period. The Grand Bend STF discharges to the Shipka Drain (formerly the Gill Lovie Drain), which flows south of the lagoons in a westerly direction, before draining into Parkhill Creek (formerly Ausable River), and Lake Huron. These watercourses are part of the Lower Parkhill Watershed, managed by the Ausable Bayfield Conservation Authority (ABCA).

The Shipka Drain is a municipal drain up to a point about 1 km upstream of Mollard Line. The remainder of the Shipka Drain, which crosses the Grand Bend STF site and discharges into Parkhill Creek, is considered to bea natural watercourse. This portion of the Shipka Drain is not considered the responsibility of the Municipality of South Huron, since it is not designated as a municipal drain.

The Grand Bend STF is jointly owned by the Municipalities of Lambton Shores and South Huron. In the existing agreement, the Municipality of Lambton Shores is designated as the "Administering Municipality" and has responsibility for operations and maintenance on behalf of the two municipalities. The STF is currently operated by OMI (Operations Management International) Inc.

According to the STF's current Certificate of Approval (C of A) issued by the Ministry of the Environment (MOE), the four lagoons have an approximate surface area of 22.7 hectares (56 acres) at a liquid depth of 1.52 m (5 ft). The total lagoon volume is estimated to be 398,500 m^3

(87.6 MIG), at a total depth of 1.83 m (6 ft), including a liquid depth of 1.52 m (5ft) with an additional 0.305 m (1 ft) of sludge depth at the bottom of the lagoons. Inlet chambers enable distribution of pumped sewage to each lagoon. Interconnecting piping between adjacent lagoons and outlet structures allow series or parallel operation. Two outlet chambers discharge directly to the Shipka Drain.

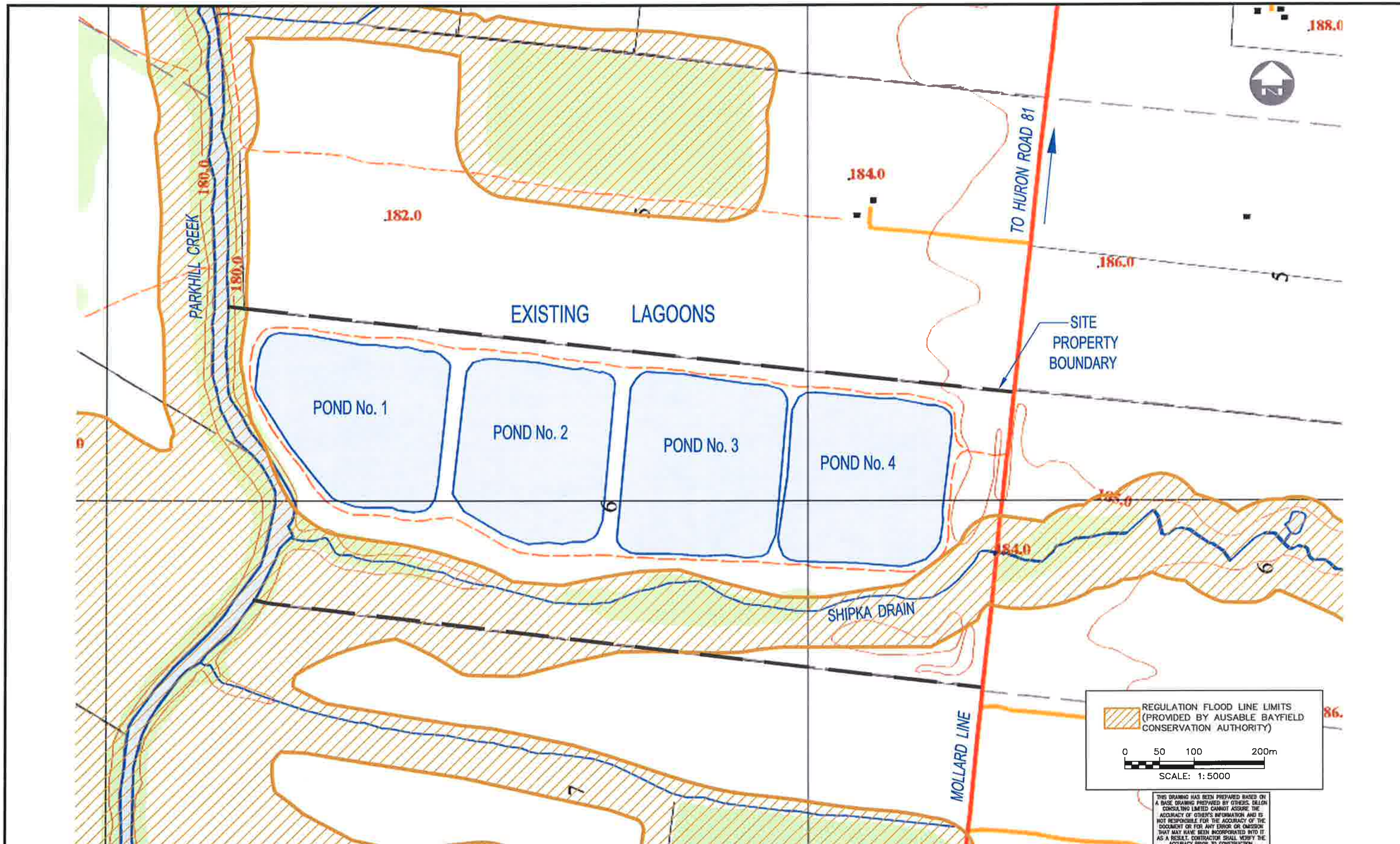
The average rated daily flow capacity of the treatment system is 1,891 m^3/d (0.416 MIGD), with capacity shared by Lambton Shores and South Huron. Based on current measured flows, the Municipality of Lambton Shores contributes approximately 55% of total flows to the Grand Bend STF, and the Municipality of South Huron contributes approximately 45% of total flows (total of approximately 880 m^3/d for 2006).

The annual average day flowrate for the period of 2002-2007 was 850 m^3/d, on average. The monthly average day flowrate is typically the highest during August. For the past three years, the monthly average day flowrate in August was as follows:

- 2005: 1,250 m^3/d
- 2006: 1,366 m^3/d
- 2007: 1,428 m^3/d.

The Grand Bend STF is approaching its capacity, particularly during the month of August, which corresponds to the peak season. Committed, currently proposed and future growth in the Study Area must be serviced by municipal sanitary sewage services to comply with Provincial policies and legislation requiring environmental protection.

The existing C of A for the Grand Bend STF includes no specific effluent quality criteria. Currently, the Grand Bend STF is operated to meet MOE Guidelines for the operation of Facultative Lagoons. The Ministry has the authority to add criteria, however, particularly in the case of an expansion and upgrade of the STF.



DILLON CONSULTING

Grand Bend Sewage Treatment Facility Expansion and Upgrade
Class Environmental Assessment

FIGURE 3: EXISTING CONDITIONS

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

The Grand Bend STF property boundary and the regulation flood line limits are shown on **Figure 3**. The Grand Bend STF property is bounded by Parkhill Creek on the west, and Mollard Line on the east. The flood line limits, provided by ABCA, correspond to the 100-year storm regulatory flood line elevation. In the case of an expansion of the Grand Bend STF, any new buildings or tankage must be constructed outside of the floodplain area at an elevation above the flood line elevation.

3.2 Population Projections

As part of the Phases 1 and 2 Update, Dillon updated the population projections included in the Master Plan for the area potentially serviced by the expansion and upgrade of the Grand Bend STF.

3.2.1 Statistics Canada Census Data Trends, 2001 to 2006

Table 2 shows census population trends from 2001 to 2006 for Ontario, Lambton and Huron Counties and the Municipalities of Lambton Shores, South Huron and Bluewater. As shown on the table:

- Ontario's population increased by 1.28% per year from 2001 to 2006
- Lambton County's population increased by only 0.19% per year
- Lambton Shores' population increased from 10,571 in 2001 to 11,150 in 2006 or by 1.1% per year, slightly less than the 1.28% increase for Ontario as a whole
- Huron County's population decreased very slightly by 0.13% per year from 59,701 in 2001 to 59,325 in 2006
- South Huron's population also decreased slightly from 10,019 to 9,982 or by 0.07% per year. Although new cottages were built along the lakeshore, the rest of South Huron is affected by declining farm populations
- Bluewater's population increased by 0.6% per year from 6,919 in 2001 to 7,120 in 2006. Most of this increase likely occurred in the lakeshore portion of the municipality.

Table 2: Census Population, 2001 and 2006

Place	2001 Population	2006 Population	Annual % Increase/Decrease
Ontario	11,410,046	12,160,282	1.28%
Lambton County	126,971	128,204	0.19%
Huron County	59,701	59,325	-0.13%
Lambton Shores	10,571	11,150	1.1%
South Huron	10,019	9,982	-0.07%
Bluewater	6,919	7,120	0.6%

Source: Statistics Canada Census Data

3.2.2 2008 Serviced Population Estimate

Table 3 shows the updated existing serviced population estimate for Lambton Shores and South Huron. Bluewater is currently not serviced.

Lambton Shores

The existing Service Area encompasses the urbanized portion of the former Village of Grand Bend. Uses in this area include downtown, densely developed older residential areas east of Parkhill Creek (formerly referred to as the Ausable River), newer, less densely developed residential areas (including the Green Forest Subdivision), the Green Haven Trailer Park, the Townsite RV Park, and commercial and residential development on Ontario Street (Highway 21) and Huron Road 81. Although the easterly one-third of Southcott Pines was provided with sewers, this area was never connected to the STF.

According to the Municipality of Lambton Shores, there are 845 sewer connections in Grand Bend, including:

- 726 residential
- 117 commercial
- two campgrounds.

According to 2006 census data, Lambton Shores had an average household size of 2.3. Assuming 2.3 persons per dwelling, the 726 residential connections serve approximately 1,670 people.

South Huron

Uses included in the South Huron portion of the Service Area on Ontario Street and Huron Road 81 include Grand Cove Estates (a large modular home development), Oakwood Resort, St. John's By the Lake Anglican Church, Huron Country Playhouse, The Space Centre, Grand Bend Motorplex and the Pickling Onion Growers (POG) Plant. There are 382 customers in the Service Area, according to South Huron. These include:

- 359 in Grand Cove Estates
- 17 occupied units in Oakwood Links condominiums[1], for a total of 376 residential connections.

According to 2006 census data, South Huron had an average household size of 2.4. Using this figure, the 376 residential connections serve 902, *say* 900 people.

Table 3: 2008 Existing Population Estimate

Place	Serviced Population	Unserviced Population	Total
Lambton Shores	1,670	2,450	4,120
South Huron	900	1,100	2,000
Bluewater	0	1,815	1,815
Total	2,570	5,365	7,935

Source: Statistics Canada Census Data

3.2.3 2008 Unserviced Population Estimate

Table 3 also shows the existing unserviced population estimate for the three municipalities.

Lambton Shores

The Master Plan estimated the 2005 existing unserviced population of the Lambton Shores portion of the Study Area at 2,370. According to Statistics Canada census data, Lambton Shores population increased by 1.1% a year from 2001 to 2006. Applying this growth rate to the 2005 population of 2,370 results in an estimated 2008 unserviced population estimate of 2,449, *say* 2,450, an increase of 80 people.

[1] This development includes a total of 33 units, as fully built out, in March 2009.

South Huron

The unserviced portion of South Huron includes Oakwood Park, Maplegrove, Sunnyside and Kingsmere Cottages and several residential and commercial uses on Ontario Street/Highway 21. It also includes the south half of Dashwood[1] and the Hayter Turkey Processing Plant. Uses in the Highway 21/Huron Road 83/Gore Road area include the Lake Huron Primary Water Supply System (LHPWSS) Water Treatment Plant, a Lambton Shores Works Yard, eleven existing houses and six vacant lots.

The servicing of existing and future non-residential uses in the South Huron portion of the Study Area will be confirmed through the subsequent collection system Class EA. The projected sanitary sewage design flows for the Study Area include Hayter's Turkey Processing Plant in Dashwood and the Birchbark Trailer Park on Huron County Road 83.

According to the Master Plan, the South Huron portion of the Study Area included 1,070 people in 2005. As shown on **Table 2**, the population of South Huron remained almost the same from 2001 to 2006. Little growth has occurred in the South Huron portion of the Study Area since 2005. This is confirmed by building permit information provided by the municipality. Since 2005, only 13 new residences were built. With an average household size of 2.4, these houses would accommodate around 30 people. Adding this to the 2005 population estimate of 1,070 results in a 2008 estimate of 1,100 people. This figure is shown on **Table 3**.

Bluewater

The Bluewater portion of the Study Area includes all of the cottages along the lakeshore from the South Huron municipal boundary to St. Joseph. It also includes the north half of Dashwood. The Master Plan estimated the 2005 population of this area to be 1,740. None of these areas are serviced.

In contrast to Huron County's census population which decreased very slightly by 0.13% from 2001 to 2006, Bluewater's census population increased by 0.6% per year. Applying this growth rate to the 2005 population of 1,740 results in an increase of 32 people resulting in an estimated 2008 population of 1,772.

[1] According to the Master Plan, the estimated existing (2005) population of Dashwood was 500 people.

However, since the Bluewater lakeshore is part of the popular Lake Huron summer resort area, it likely experienced more growth than the rest of Bluewater. According to the municipality's Building Department, 30 new residences were built in the area from 2005 to 2007 (inclusive). Assuming an average household size of 2.5 persons (2006 census data for Bluewater), the 30 new houses would accommodate about 75 people. Adding this figure to the 2005 population of 1,740 results in a 2008 population estimate of 1,815, as shown on **Table 3**.

3.2.4 Tourist (Day Visitors) Populations

Dillon contacted Sarnia-Lambton Tourism and Grand Bend & Area Chamber of Commerce to obtain any up-to-date figures on the number of tourists in the Grand Bend area. Sarnia-Lambton Tourism has figures for Lambton County as a whole, but these figures are not disaggregated by destination or municipality. The Chamber of Commerce is also not aware of any available figures on the number of tourists. It suggested, however, that Dillon obtain the total number of parking spaces in Grand Bend from Lambton Shores and multiply them by an average of 3.5 persons per vehicle to obtain an estimate of the number of day visitors.

According to Lambton Shores, Grand Bend includes a total of 938 municipal parking spaces. Doubling this figure to account for on-street parking results in an estimate of 1,876, *say* 1,875 spaces. Assuming 3.5 persons per vehicle, these spaces could accommodate more than 6,500 day tourists.

This estimate is approximately equal to that included in a study prepared in 1983 on "Economic Opportunities in the Village of Grand Bend" by Emric Suiches. According to the study, an average of 6,000 tourists visited Grand Bend per weekday in the summer of 1983. The study also estimated that there are from 5,000 to 10,000 tourists in the village on an average summer weekend day. These figures were expected to grow by 2% per year.

A 2% per year growth rate from 1983 to the present results in the following estimates for 2008:

- approximately 9,850 tourists per summer weekday
- from approximately 8,200 to approximately 16,400 tourists per summer weekend day.

The lower figure of 6,500 appears to be more realistic, especially in view of the recent significant decline in the number of American tourists and cottagers in the Grand Bend area. This decline has been noted by the Grand Bend Chamber of Commerce and local realtors and is expected to continue over the short-term due to the current economic slowdown.

3.2.5 Year Round and Seasonal Populations

Lambton Shores

The Master Plan estimated that approximately 50% of the Lambton Shore's portion of the Study Area was year round and 50% was seasonal. An analysis of quarterly water consumption data for the Lambton Shores portion of the Study Area (serviced and unserviced), indicates that the Quarter 3 (July-Sept) water consumption is roughly double the consumption in Quarter 4 (Oct-Dec). This confirms that 50% of the population is seasonal and 50% is year round.

The percentage of year round population is expected to increase, however. According to the municipality, seasonal residents are now retiring to the Grand Bend area and becoming permanent residents. In addition, recent and proposed developments consist of expensive, year round type houses. Based on these considerations, Dillon is assuming that the future split of year round/seasonal will increase to around 60% year round and 40% seasonal.

South Huron

The Master Plan estimated that approximately 30% of the cottages in Oakwood Park, Maple Grove, Sunnyside and Kingsmere are used year round and the rest are seasonal. The municipality believes this estimate is still valid. An analysis of quarterly water consumption data for the South Huron portion of the Study Area (serviced and unserviced), indicates that the Quarter 3 (July-Sept) water consumption is roughly 2.8 times the consumption in Quarter 4 (Oct-Dec). This comparison of seasonal water consumption indicates that the South Huron portion of the Study Area has 35% year round residents. The Master Plan assumption of 30% year round and 70% seasonal is more conservative and was used for this ESR.

Dashwood's population (in both South Huron and Bluewater) is assumed to 100% year round.

Bluewater

Based on an analysis of mailing addresses, the Master Plan estimated that 30% of the residences in the Bluewater portion of the Study Area are year round, while the remaining 70% are seasonal. The Huron County Planning & Development Department's Planner for Bluewater, believes that this assumption is still valid. An analysis of quarterly water consumption data for the Bluewater portion of the Study Area (serviced and unserviced), indicates that the Quarter 3 (July-Sept) water consumption is roughly 2.5 times the consumption in Quarter 4 (Oct-Dec). This comparison of seasonal water consumption implies that the Bluewater portion of the Study Area has 40% year round residents. The Master Plan assumption of 30% year round and 70% seasonal is more conservative and was used for this ESR.

3.2.6 Population Projections to 2031

Demographic, Economic and Housing Market Trends

Ministry of Finance, "Ontario Populations Projections Update, 2006 to 2031" (Spring 2007) for Ontario and its 49 Census Divisions projects that the population of Southwestern Ontario is projected to grow at 0.6% per year from 1,579,000 in 2006 to 1,858,000 in 2031. Essex County is expected to grow the fastest at 0.8% and Lambton County is expected to grow at a very slow rate of 0.14% per year. This is only slightly higher than the Ministry's 2005 prediction that Lambton County's population will grow at a very slow rate of 0.12% per year to 2031. Huron County's population is expected to grow by 0.4% per year or at approximately the same rate projected by the Ministry of Finance in 2005.

A major influence on on-going and future development trends is the aging and retirement of the "baby boom" generation. According to Royal LePage Canada's "50-Plus Report" (November 2006), the more than 10 million Canadians now aged 50-plus are having a significant impact on the country's housing market. The report notes that "the 50-plus demographic represents the fastest growing and largest single consumer group and is changing the Canadian economic landscape and redefining the approach to business in almost every industry."

Currently, almost 30% of Canadians 50 and over intend to sell their home as part of their retirement plans. Significant numbers are not retiring close to home, but are choosing to retire to lakeshore communities or idyllic "small town" Ontario within a reasonable distance of a major urban centre. Also popular, are developments centered on golf courses, such as Southbend Estates, or other recreational or cultural facilities.

The Grand Bend area, including the lakefront of Lambton Shores, South Huron and Bluewater has become one of Ontario's most popular summer resorts. Its lakefront, sandy beaches and Carolinian vegetation (not in Bluewater), all within a 45 minute drive of the big city facilities of London, provide a very attractive environment for retirees from all over Ontario and the United States. As noted in "Boom, Bust and Echo" written by Canada's leading demographer David K. Foot (1996), many baby boomers are "cashing in their city homes for big profits" and moving to smaller centres. Also popular, as noted in the Globe and Mail "Report on Empty Nesters" (October 30, 2006), is the "snowbird lifestyle", where retirees spend six months in the southern United States and six months in Canada in a smaller, more manageable house. Many residents of Grand Bend have a "snowbird lifestyle".

The housing market, however, is likely to be affected by slow economic growth over the short-term (three to five years) due to the current economic slowdown. Although there are recession "worries" in Canada, the demand for lakeshore cottages and retirement properties does not appear to be decreasing. As a result, the Study Area continues to have significant development potential.

Lambton Shores

The 2006 Master Plan projected a fairly high growth rate of 2% per year for the Lambton Shores' portion of the Study Area, based on previous population projections, the significant amount of development that occurred from 2000 to 2005 and the significant number of lots that are registered or draft plan approved in the Study Area (almost 1,000). Recently proposed developments include a new Phase of Grand Cove Estates on Huron Road 81 with 43 single-family residential lots, 5.7 hectares of multi-family residential development and 7.8 hectares of commercial development.

Based on the attractiveness of the Lambton Shores portion of the Study Area for development, a 2% growth rate still appears to be realistic for the Study Area despite the current economic slowdown. This assumption was confirmed by building permit information provided by Lambton Shores. In 2007, for example, 27 building permits were issued for new houses in the Study Area, potentially resulting in an increase of 62 people (2.3 persons per household) in one year. This is equivalent to a 2.5% per year population increase (assuming the existing population is around 2,450, as shown on **Table 3**).

Development is currently limited, however, by a lack of treatment capacity at the Grand Bend Sewage Treatment Facility (STF). Until the upgraded STF is operational (around 2012), only limited development will be possible in the Study Area. Based on this, population projections to 2012 are based on a 1% per year growth rate. This rate is similar to growth that occurred in Lambton Shores as a whole from 2001 to 2006. For the remainder of the projection period from 2013 to 2031, a 2% growth rate was used reflecting the significant development potential of this part of Lambton Shores.

South Huron

The Master Plan projected a moderate growth rate of 0.5% for the South Huron portion of the Study Area. Extensive new development along the lakeshore west of Highway 21 is constrained by the presence of existing cottage development and the lack of "greenfield" land for development. It is unlikely that these areas will be redeveloped in the foreseeable future. In addition, the south side of Dashwood has little development potential.

Although development is constrained, this area appears to have some development potential based on currently proposed developments. Proposals include 44 townhouse units in Grand Cove Estates (Phase 5) and a small industrial park south of the POG Plant on Huron Road 81. The municipality plans to allocate sewage capacity to these uses.

Development in the South Huron portion of the Study Area will be constrained until the Grand Bend STF upgrade is completed in 2012. Based on this, population projections to the year 2012 for the South Huron portion of the Study Area are based on the same moderate rate of 0.5% used in the 2006 Master Plan. This also reflects the slight population decline that occurred in South Huron as a whole from 2001 to 2006. After 2012, a higher rate of 1% per year is projected based on the development potential of the South Huron lakeshore. The municipality has agreed with these growth rates.

Bluewater

The Master Plan also used a growth rate of 0.5% per year for the Bluewater portion of the Study Area. Development in this area is currently, and will continue to be, constrained by the lack of sewers until the Grand Bend STF upgrade is completed in 2012. Also, the north half of Dashwood has little development potential.

Population projections to the year 2012 for the Bluewater portion of the Study Area are based on the same moderate rate of 0.5% per year. This is consistent with the 0.6% per year increase in census population from 2001 to 2006. Based on the development potential of the Bluewater lakeshore, however, and the attractiveness of this area for vacation and retirement homes, a higher rate of 1% per year was used for the 2013 to 2031 projections. Bluewater's Huron County Planner has agreed with these growth rates.

Population Projections to 2031

The estimated 2008 populations shown on **Table 3** were used as the "starting point" for the projections to 2031. Population projections, using the growth rates outlined in the preceding sections are shown on **Table 4:**

- population in the Lambton Shores portion of the Study Area is expected to increase from 4,120 in 2008 to 6,246 in 2031
- South Huron's population is expected to increase from 2,000 in 2008 to 2,465 in 2031
- Bluewater's population is expected to increase from 1,815 in 2008 to 2,237 in 2031
- in total, the population of the Study Area is expected to increase by more than 3,000 people from 7,935 in 2008 to 10,948 in 2031.

Table 4: Population Projections to 2031

Year	Lambton Shores [1]	South Huron [2]	Bluewater [2]	Total
2008	4,120	2,000	1,815	7,935
2011	4,245	2,030	1,842	8,117
2016	4,641	2,123	1,927	8,691
2021	5,124	2,231	2,025	9,380
2026	5,657	2,345	2,128	10,131
2031	6,246	2,465	2,237	10,948

[1] Based on 1% per year growth rate to 2012, 2% per year growth from 2013 to 2031
[2] Based on 0.5% per year growth rate to 2012, 1% per year growth from 2013 to 2031

3.3 Sanitary Sewage Flow Projections

Sanitary sewage flows for the Study Area were projected to 2031. Sewage flows from the existing Service Area were estimated by proportionally increasing current flows, based on the 2031 population projections. According to the staff and owners of the Grand Bend Motorplex, POG Plant, and Huron Country Playhouse, there are no plans to expand these facilities. Based on this, current industrial/commercial/institutional (ICI) wastewater flows to the Grand Bend STF were assumed to remain constant in the future.

Monthly or seasonal population data was not available and could not be accurately estimated for the Study Area, due to the seasonal nature of Grand Bend and the surrounding area. In order to consider and estimate the future monthly variation in wastewater flow for the current unserviced area, quarterly water consumption data was considered.

Sanitary sewage flows were estimated for uses and areas not currently serviced by the Grand Bend STF, based on the following information:

- Residential Areas in Bluewater, South Huron and Lambton Shores: estimated flows are based on water consumption data for the Bluewater lakeshore, Dashwood, South Huron lands along both sides of Highway 21, lands along the north and south side of Huron Road 83 from Dashwood to Highway 21, and Lambton Shores' lands along both sides of Highway 21 from the Ausable River Cut to south of Grand Bend.
- Pinery Provincial Park: estimated flows are based on the design basis for the Pinery Provincial Park in-park Sanitary Sewage Collection System.
- Trailer Parks in the Study Area: estimated flows are based on water consumption data for the following parks:
    - Lambton Shores: Klondyke Trailer Park and Rus-ton Village Family Campground
    - South Huron: Birchbark Trailer Park
    - Bluewater: Turnbull's Grove Trailer Park.
- Hayter's Turkey Products: estimated flow is based on water consumption data and the rated capacity of the existing onsite wastewater treatment system (136 m^3/d).
- Proposed Grand Bend Airport Industrial Subdivision (on Huron Road): estimated flow is based on the proposed site plan for the development, including typical lot size and typical flow rates per area for dry-type, small-scale industry, as permitted by the Municipality of South Huron Official Plan.

Extraneous flowrates, including infiltration and inflow, were considered for the 2031 projected flowrates, for the entire Study Area. The type of collection system for the areas to be serviced will be determined by the three municipalities as part of individual Class EA projects for the collection systems. Gravity systems have a higher corresponding infiltration and inflow allowance of 90 L/capita·day. In comparison, a low pressure system has no infiltration or inflow. Using a conservative approach for the 2031 sanitary sewage projections, it was assumed that the entire collection system would have a conventional gravity collection system.

The total projected sanitary sewage average day flow (ADF) presented in **Table 5** is a sum of the sanitary sewage flow estimate and the extraneous flowrate.

Table 5: Existing and Projected Daily Sanitary Sewage Flows

	Existing – 2006*		Projected - 2031	
Area	**Annual ADF (m^3/d)**	**Maximum Month (August) ADF (m^3/d)**	**Annual ADF (m^3/d)**	**Maximum Month (August) ADF (m^3/d)**
Lambton Shores (incl. trailer parks)	484	969	2,003	3,285
South Huron (incl. trailer parks)	326	322	971	1,464
Bluewater (incl. trailer parks)	--	--	993	1,942
Pinery Provincial Park	--	--	253	593
Huron Country Playhouse	7	30	7	30
POG Plant and Grand Bend Motorplex	58	186	58	186
Hayter's Turkey Products (Processing Plant)	--	--	38	31
Proposed Grand Bend Airport Industrial Subdividsion	--	--	336	336
TOTAL	**875**	**1,507**	**4,659**	**7,867**

Notes: * 2006 was considered to be a typical year, based on a comparison of annual Grand Bend STF data for 2002-2007
-- not currently serviced
Annual ADF is the total volume of wastewater to the STF divided by the number of days in a year.
Maximum Month is the month having the highest average day flow, typically the month of August.

A Flow Monitoring and Wastewater Sampling Program was completed between May 1 – October 31, 2008 to better understand the current variation in wastewater flow and influent quality to the Grand Bend STF. The results of this program were used to establish current and projected wastewater flows and loadings. In particular, this data was used to establish the peaking factors for peak hourly flow and peak instantaneous flow. For design purposes, it was assumed that the future Service Area would maintain similar peaking factors for maximum day flow, peak hourly flow, and peak instantaneous flow.

The 2031 projected wastewater contaminant loadings were calculated for each quarter using the 2002-2007 average influent quality for the current serviced area, and using equivalent populations (based on water consumption data) and per capita wastewater contaminant loading rates for the current unserviced area.

3.4 Other Municipal Infrastructure

Currently, wastewater is delivered to the Grand Bend STF via three separate forcemains:

- Forcemain (350 mm diameter) from the Grand Bend Main Pumping Station (No. 2), near the intersection of Gill Road and Highway 81, which transfers wastewater flows from the former Village of Grand Bend and adjacent serviced areas
- Forcemain (100 mm diameter) from the Grand Bend Motorplex and the POG Plant
- Forcemain (100 mm diameter) from the Huron Country Playhouse.

These flows combine in an inlet structure between Lagoon Cells 3 and 4 along the northern portion of the Grand Bend STF site.

The Grand Bend STF is located on Mollard Line, a rural, gravel surface roadway, with both roadside as well as municipal drainage. There is aerial hydro (3 phase primary) power along Mollard Line, as well as buried infrastructure including telecommunications (Hay Communications Co-operative Limited). The Grand Bend STF site is currently not supplied with power.

Two watermains (100 mm and 600 mm diameters) have been installed along Mollard Line. The 600 mm watermain runs along the southern property line of the Grand Bend STF site and crosses Parkhill Creek. The section of watermain on the Grand Bend STF property was installed in 2005.

The expansion and upgrade of the Grand Bend STF requires utilities such as water, communication (phone and potentially cable), and hydro power. These utilities could be accommodated along the access road.

3.5 Cultural Resources

In the Fall of 2008, Fisher Archaeological Consulting (FAC) completed a Stage 1 Archaeological Assessment of the Grand Bend STF site, as documented in a report dated October 2008 submitted to the Ministry of Culture. The Stage 1 Assessment concluded that those areas on the site that have not been previously disturbed by the construction of the lagoons have high potential for the recovery of Aboriginal archaeological resources. There is also high potential for the recovery of historic Euro-Canadian material within 50 metres of Mollard Line and Parkhill Creek, both historic transportation routes. A Stage 2 assessment was recommended for all areas with high archaeological and historic potential. FAC's recommendations were approved by the Ministry of Culture in a letter dated December 22, 2008.

FAC is currently completing a Stage 2 Archaeological Assessment of undisturbed areas, as recommended by the Stage 1 assessment. The Stage 2 assessment does not include land previously assessed as part of the Stages 1-3 Archaeological Assessments completed in 2003 of the New Transmission Watermain. Subsequent, more detailed, assessments may be required depending on the results of the Stage 2 assessment.

3.6 Receiver Background Review

The Grand Bend STF discharges to the Shipka Drain, which flows south of the lagoons in a westerly direction, before draining into Lower Parkhill Creek, and Lake Huron. The Shipka Drain is a municipal drain up to a point about 1 km upstream of Mollard Line. The remainder of the Shipka Drain, which crosses the Grand Bend STF site and discharges into Parkhill Creek, is considered a natural watercourse.

The Lower Parkhill Creek (formerly known as the Ausable River) conveys water from the Parkhill Reservoir northwest to Lake Huron. To establish effluent discharge criteria for the proposed upgraded Grand Bend STF, Dillon reviewed water quality and flow conditions in Lower Parkhill Creek, based on information provided by the ABCA.

Water Quality

As shown on **Figure 4**, water quality in the Lower Parkhill Creek watershed has been monitored at various locations by the ABCA, including:

- Station 1. Lower Parkhill Creek at McGuffin Hills Drive, east of Godkin Road, east of Parkhill, upstream of the Parkhill Reservoir
- Station 2. Lower Parkhill Creek at McInnis Road, near Parkhill Drive, between Lots 15 and 16, west of Parkhill, downstream of the Parkhill Reservoir
- Station 3. Desjardine Municipal Drain, Kirkton Road, just off Highway 81, east of Grand Bend.

Stations 1 and 2 on the Lower Parkhill Creek are located upstream of the existing Grand Bend STF. Station 3 on the Desjardine Drain, a tributary of Parkhill Creek, is located downstream of the STF. Stations 2 and 3 were used for the assessment since they are the only stations that provide historical data in proximity to the Grand Bend STF.

In 2006, the Municipality of Lambton Shores completed a Surface Water Quality Monitoring program of various locations, including Parkhill Creek, Shipka Drain and the Desjardine Drain. Grab sampling was conducted on six dates between July and November of 2006. Samples were analyzed for Total Phosphorus, Nitrates, and E. coli. The monitoring program indicated that:

- Upstream of the Grand Bend STF: The 2006 measured water quality at the Parkhill sampling station (LS33) at Greenway Road agreed with the historical water quality of the McInnis Road ABCA monitoring station.

- Downstream of the STF: The Shipka Drain (LS40) and Desjardine Drain (LS39) stations had similar measured water quality in 2006. Measured water quality at the Parkhill sampling station (LS36) at Highway 21 in 2006 was similar to both the Shipka (LS40) and Desjardine Drains (LS39) and agreed with the historical water quality of the Desjardine Drain ABCA monitoring station.

Monitoring of water quality at the ABCA stations has been completed on a monthly basis for several years and provides more data, compared to the Lambton Shores 2006 Water Quality

Monitoring Program. Historical water quality data for the ABCA McInnis Road and Desjardine Drain monitoring stations is used in the following assessment.

Water quality parameters monitored by the ABCA in Parkhill Creek include:

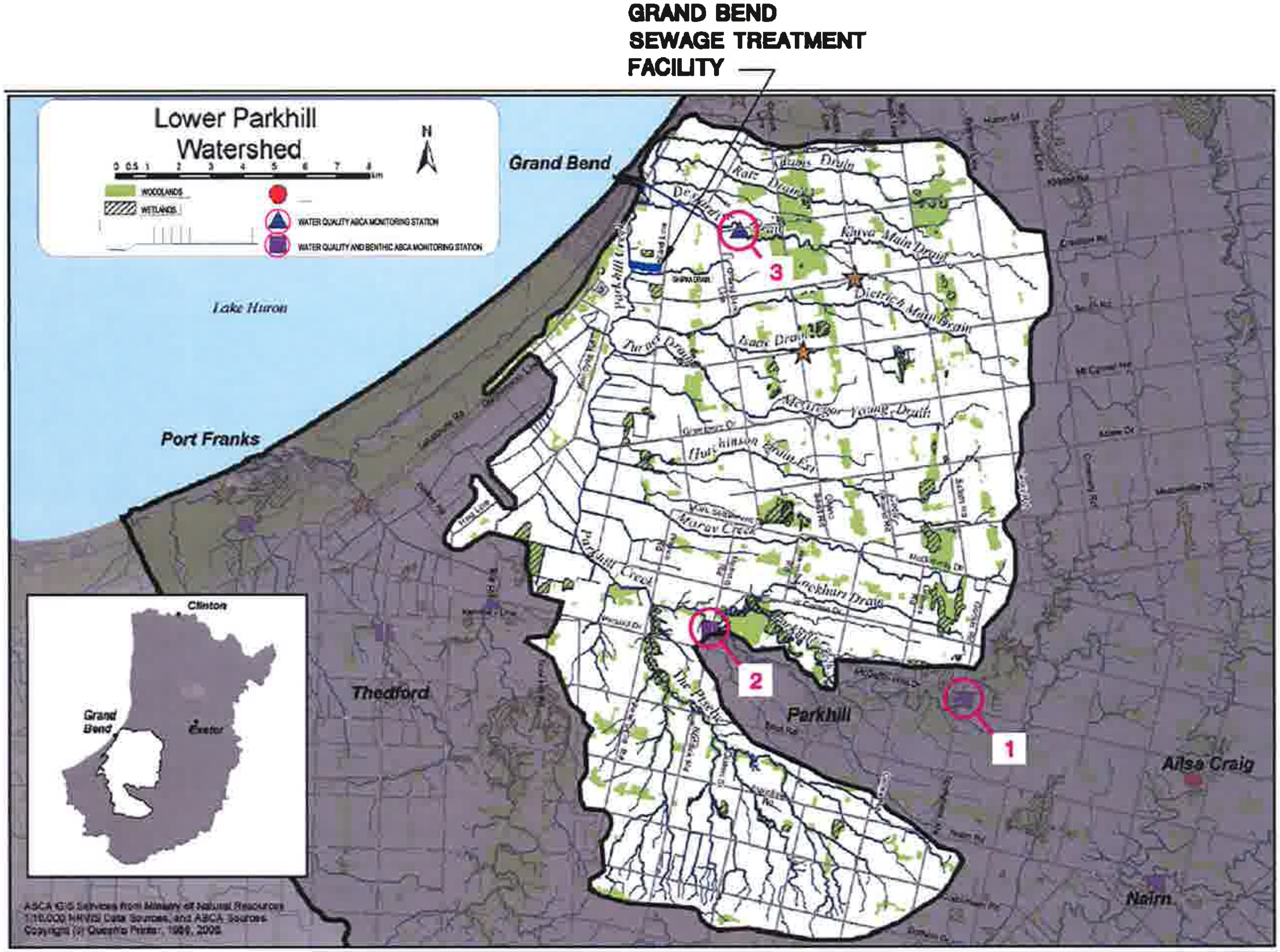
- Total Ammonia Nitrogen
- Total Kjeldahl Nitrogen
- E. coli
- Dissolved oxygen
- Nitrate Nitrogen
- Nitrite Nitrogen
- pH
- Total Phosphorus
- Total Dissolved Solids
- Conductivity
- Water temperature.

Water quality in Lower Parkhill Creek was evaluated for each parameter. The average, minimum, maximum, and 75th percentile of the historical values were calculated and reported. Normally, the 75th percentile of water quality data is used for consideration of background quality of the receiving water body, as required by MOE "Procedure B-1-5: Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters" (1994). The 75th percentile level of each water quality parameter was compared to both the Provincial Water Quality Objective (PWQO) (MOE, 1994) and/or the Environment Canada Aquatic Water Quality Guidelines (CWQG) (Canadian Council of Ministers of the Environment (CCME), 2002).

Tables 6 and **7** provide water quality summary data for the McInnis Road and Desjardine Drain monitoring stations, respectively. **Table 8** provides water quality summary data for the Grand Bend STF.

As shown on **Tables 6** and **7**, the McInnis Road and Desjardine Drain monitoring stations met the following PWQO and CWQG parameters:

- Total Ammonia Nitrogen
- Total Kjeldahl Nitrogen



Grand Bend Sewage Treatment Facility Expansion and
Upgrade Class Environmental Assessment

FIGURE 4: LOWER PARKHILL CREEK WATERSHED:
ABCA SAMPLING LOCATIONS

DILLON CONSULTING

Lambton Shores

MUNICIPALITY OF BLUEWATER 2001

- Dissolved oxygen
- Dissolved oxygen saturation
- pH
- Total Dissolved Solids
- Conductivity
- Water temperature.

Un-ionized ammonia was calculated based on the measured ammonia concentration, pH, and water temperature, as shown in the following equation:

$$\text{un-ionized ammonia} = \text{ammonia} \cdot f$$
$$f = \frac{1}{1+10^{(pKa-pH)}}$$
$$pKa = 0.0901821 + \frac{2729.92}{T} \quad \textit{for T in Kelvin}$$

Un-ionized ammonia concentration in Parkhill Creek was found to be below the CWQG at the two ABCA monitoring stations, based on the above formula.

Dissolved oxygen (DO) concentration and saturation values were evaluated at the 25^{th} percentile, as opposed to the 75^{th} percentile, since lower values of these parameters indicate poorer water quality. In some instances, DO saturation values were above 100%, which is generally observed in flowing waters that have some algae.

The Lower Parkhill Creek background water quality data shows evidence of elevated levels of the following parameters in excess of the Provincial and/or Canadian water quality objectives:

- E. coli: The PWQO recommends a limit of 100 *E. Coli* per 100 mL. Both the McInnis Road and Desjardine Drain monitoring stations exceeded this objective with 75^{th} percentile values of 450 and 540 *E. Coli* per 100 mL, respectively. The Grand Bend STF discharge had a 75^{th} percentile value of 29 *E. Coli* per 100 mL.

- Nitrate Nitrogen: The CWQG recommends a maximum nitrate concentration of 2.9 mg/L as nitrogen. Observed nitrate concentrations in Parkhill Creek at Stations 2 and 3 exceed the CWQG at the average and 75^{th} percentile.

Table 6:
Lower Parkhill Creek Water Quality at McInnis Road Monitoring Station (west of Parkhill)

Parameter	April 2003 to Nov 2007				MOE PWQO, (Appendix A, 1999) mg/L except as noted	CCME CWQG, (1999 with Update 7, 2007) mg/L except as noted	Water Quality Comment (75th Percentile)
	Average	Min	Max	75th Percentile			
Total Ammonia-N, mg/L	0.051	0.000	0.170	0.050	-	-	-
Total Kjeldahl Nitrogen (TKN), mg/L	0.78	0.32	1.70	0.95	-	-	-
Un-ionized Ammonia (calculated), mg/L	0.0019737	0.0000004	0.1700000	0.0021861	0.0164 as N	0.0152 as N	
Bacteria, E. coli per 100 mL	1034	0	25000	540	100 E. coli per 100 mL	-	Exceeds PWQO
Biological Oxygen Demand (BOD), mg/L	--	--	--	--	-	-	-
Field Dissolved Oxygen*, mg/L	11.62	6.34	16.83	10.05	Derived from Saturation	6.0 mg/L, warm-water early life stages 5.5 mg/L, warm-water other life stages	-
Dissolved Oxygen* (calculated)*, % Sat.	109.16%	74.26%	161.11%	99.68%	57% Saturation, Cold Water Biota @ 20°C	-	-
Nitrate-N, mg/L	6.8	2.7	13.4	8.1	-	2.9 as N	Exceeds CWQG
Nitrite-N, mg/L	0.064	0.020	0.160	0.100	-	0.06 as N	Exceeds CWQG
Field pH	7.9	4.9	8.5	8.2	6.5 - 8.5	6.5 - 9.0	-
Dissolved Phosphorus, mg/L	0.02256	0.00000	0.05100	0.02875	-	-	-
Total Phosphorus, mg/L	0.049	0.000	0.145	0.071	0.03	-	Exceeds PWQO
Total Suspended Solids, mg/L	--	--	--	--	-		-
Total Dissolved Solids, mg/L	337	142	498	385	-		
Conductivity, mS/cm	480	219	735	585			
Field Water Temperature, °C	13.6	0.2	24.4	19.7	10°C Increase, Max 30°C	(Only marine limits specified)	-

* Note. Dissolved Oxygen evaluated at 25th percentile (and not 75th percentile)
N/D - Below Detection Limit

Table 7:
Lower Parkhill Creek Water Quality at Desjardine Drain Monitoring Station

Parameter	Jan 1972 to Nov 2007				MOE PWQO, (Appendix A, 1999) mg/L except as noted	CCME CWQG, (1999 with Update 7, 2007) mg/L except as noted	Water Quality Comment (75th Percentile)
	Average	Min	Max	75th Percentile			
Total Ammonia-N, mg/L	0.053	0.001	0.452	0.063	-	-	-
Total Kjeldahl Nitrogen (TKN), mg/L	--	--	--	--	-	-	-
Un-ionized Ammonia (calculated), mg/L	0.0014990	0.0000013	0.0123399	0.0018844	0.0164 as N	0.0152 as N	-
Bacteria, E. coli per 100 mL	349	16	2600	450	100 E. coli per 100 mL	-	Exceeds PWQO
Biological Oxygen Demand (BOD), mg/L	--	--	--	--	-	-	-
Field Dissolved Oxygen*, mg/L	9.03	0.50	15.83	7.50	Derived from Saturation	6.0 mg/L, warm-water early life stages 5.5 mg/L, warm-water other life stages	-
Dissolved Oxygen* (calculated)*, % Sat.	82.40%	3.54%	141.01%	67.62%	57% Saturation, Cold Water Biota @ 20°C	-	-
Nitrate-N, mg/L	5.1	0.0	16.2	7.2	-	2.9 as N	Exceeds CWQG
Nitrite-N, mg/L	0.055	0.003	0.260	0.070	-	0.06 as N	Exceeds CWQG
Field pH	7.8	4.96	8.39	8.08	6.5 - 8.5	6.5 - 9.0	-
Dissolved Phosphorus, mg/L	--	--	--	--	-	-	-
Total Phosphorus, mg/L	0.139	0.032	0.440	0.164	0.03	-	Exceeds PWQO
Total Suspended Solids, mg/L	--	--	--	--	-	-	-
Total Dissolved Solids, mg/L	311	122	427	348	-	-	-
Conductivity, mS/cm	532	247	810	585			
Field Water Temperature, °C	11.6	0.0	26.4	19.5	10°C Increase, Max 30°C	(Only marine limits specified)	-

* Note. Dissolved Oxygen evaluated at 25th percentile (and not 75th percentile)
N/D - Below Detection Limit

Table 8:
Grand Bend Sewage Treatment Facility Effluent Quality

Parameter	Jan 2002 to Nov 2007				MOE PWQO, (Appendix A, 1999) mg/L except as noted	CCME CWQG, (1999 with Update 7, 2007) mg/L except as noted	Water Quality Comment (75th Percentile)
	Average	Min	Max	75th Percentile			
Total Ammonia-N, mg/L	1.176	0.080	8.900	1.148	-	-	-
Total Kjeldahl Nitrogen (TKN), mg/L	2.02	0.08	8.40	2.25	-	-	-
Un-ionized Ammonia (calculated), mg/L	--	--	--	--	0.0164 as N	0.0152 as N	
Bacteria, E. coli per 100 mL	23	1	95	29	100 E. coli per 100 mL	-	Below PWQO
Biological Oxygen Demand (BOD), mg/L	7.1	1.0	19.1	9.9	-	-	-
Field Dissolved Oxygen*, mg/L	--	--	--	--	Derived from Saturation	6.0 mg/L, warm-water early life stages 5.5 mg/L, warm-water other life stages	-
Dissolved Oxygen* (calculated)*, % Sat.	--	--	--	--	57% Saturation, Cold Water Biota @ 20°C	-	-
Nitrate-N, mg/L	1.4	0.8	2.6	1.8	-	2.9 as N	Below CWQG
Nitrite-N, mg/L	0.051	0.006	0.450	0.015	-	0.06 as N	Below CWQG
Field pH	8.1	7.2	9.3	8.4	6.5 - 8.5	6.5 - 9.0	-
Dissolved Phosphorus, mg/L	--	--	--	--	-	-	-
Total Phosphorus, mg/L	0.658	0.090	2.000	0.820	0.03	-	Exceeds PWQO
Total Suspended Solids, mg/L	12.3	3.0	22.5	18.3	-	-	-
Total Dissolved Solids, mg/L	--	--	--	--			
Conductivity, mS/cm	--	--	--	--			
Field Water Temperature, °C	--	--	--	--	10°C Increase, Max 30°C	(Only marine limits specified)	-

* Note. Dissolved Oxygen evaluated at 25th percentile (and not 75th percentile)
N/D - Below Detection Limit

- Nitrite Nitrogen: The CWQG recommends a maximum nitrite concentration of 0.006 mg/L as nitrogen. Observed nitrite concentrations in Parkhill Creek at Stations 2 and 3 exceed the CWQG at the 75th percentile.

- Total Phosphorus: The PWQO includes a phosphorus limit of 0.030 mg/L to avoid excessive plant growth. Water quality data for Parkhill Creek and the STF indicate that this limit is exceeded at the average and 75th percentile.

Lower Parkhill Creek is considered a Policy 2 Receiver with respect to E. coli and Total Phosphorus, since its water quality does not presently meet PWQO parameters. Policy 2 of MOE's Water Management Policies Guidelines, and the PWQO states:

> "Water quality which presently does not meet the PWQOs shall not be further degraded and all practical measures shall be undertaken to upgrade the water quality to the objectives… Where new or expanded discharges are proposed, no further degradation will be permitted and all practical measures shall be undertaken to upgrade water quality."
>
> (MOE, 1994)

Flow Conditions

The Lower Parkhill Watershed drains a total area of approximately 310 km^2. According to the Fish Habitat Management Plan, tributaries within the Lower Parkhill Watershed have highly variable run-off ranging from extremely low base flows to short periods of high discharge (ABCA, 2001).

Hourly flow monitoring of the Parkhill Creek has been completed by the ABCA since 2000 at Elliot Drive, east of Roddick Road. This station is located upstream of the Grand Bend STF. Flow data for this station from 2000-2007 was provided by ABCA. As shown by the data, there were several days when Parkhill Creek had no base flow at this location, including days in the following months:

- July, August, September and October of 2002
- September of 2003
- October of 2004
- July of 2005
- July and August of 2007.

Many of the Parkhill Creek tributaries, between the flow monitoring station at Elliot Drive and the Grand Bend STF, are municipal drains that only seasonally discharge flow. It is assumed that when there is no base flow in Parkhill Creek at the monitoring station, there is no additional flow from the municipal drains, which discharge to Parkhill Creek, upstream of the monitoring station.

The 7Q20 flow can be considered as the minimum 7-day average low flow with a recurrence period of 20 years. The 7Q20 flow is used as the basic design flow for the receiving water body for *continuous point source discharges*, according to MOE "Procedure B-1-5: Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters" (1994). According to MOE's procedure for *non-continuous point source discharges*, the 7Q20 for the specific discharge period is ideally used as the basic design flow for the receiving water body.

The Grand Bend STF is currently operated by discharging the lagoons seasonally, anywhere from one to four times a year. The Grand Bend STF effluent discharges from 2000 to 2007 did not coincide with a period of zero base flow in Parkhill Creek.

If the upgraded Grand Bend STF is a continuous point source discharge, the 7Q20 flow that will be applied on a conservative basis will be 0 m^3/d, or the equivalent of no base flow.

3.7 Fish and Aquatic Habitat

A variety of sources were reviewed pertaining to the aquatic environment within the vicinity of the STF. Relevant sources of biological information included:

- Fish and benthic data from the ABCA
- Lower Parkhill Creek Watershed Report Card (ABCA, 2007)
- Fish Habitat Management Plan (ABCA, April 2001)
- Rare species occurrences and significant natural features from the Natural Heritage Information Centre (NHIC) database
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
- Ausable River Recovery Team, March 2004. Draft Recovery Strategy for Species at Risk in the Ausable River: An Ecosystem Approach, 2004-2009.

Both Parkhill Creek and Shipka Drain are considered warmwater systems by the ABCA. Shipka Drain is currently managed as a Type F watercourse (e.g., warmwater regime with intermittent or ephemeral flows). Downstream in Parkhill Creek, the system is classified as warmwater and natural, and as such, is not managed under the ABCA/Fisheries and Oceans Canada (DFO) Drain Classification System. According to the Lower Parkhill Watershed Report Card (ABCA, 2007), the main channel of Parkhill Creek supports a warmwater sport and baitfishery and its tributaries support baitfish. At the time of writing, background fisheries information had not been received from MNR.

Fish species listed in **Table 9** for the upper portions of Parkhill Creek indicate a mixed and diverse fishery within the watercourse, and possibly Shipka Drain on a seasonal basis. Generally speaking, this community can be characterized as being dominated by small-bodied baitfish with a small top-level predator contingent (e.g., largemouth bass). There appears to be a strong presence of bottom-dwelling species (e.g., suckers, bullhead, darters, sculpins, gobies, stonecats and madtoms). All of the species listed in the Table are typically found in abundance in warmwater habitats in southern Ontario.

Table 9: Fish Species of Upper Parkhill Creek, 2002

Common Name	Scientific Name
white sucker	*Catostomus commersoni*
white crappie	*Pomoxis annularis*
Brown bullhead	*Ameiurus nebulosus*
Yellow bullhead	*Ameiurus natalis*
Yellow perch	*Perca flavescens*
common carp	*Cyprinus carpio*
golden redhorse	*Moxostoma erythrurum*
spottail shiner	*Notropis hudsonius*
rock bass	*Ambloplites rupestris*
largemouth bass	*Micropterus salmoides*
creek chub	*Semotilus atromaculatus*
bluntnose minnow	*Pimephales notatus*
striped shiner	*Luxilus chrysocephalus*
johnny darter	*Etheostoma nigrum*
stonecat	*Noturus flavus*
mottled sculpin	*Cottus bairdii*
central mudminnow	*Umbra limi*
Round goby	*Neogobius melanostomus*
hornyhead chub	*Nocomis biguttatus*
brindled madtom	*Noturus miurus*
Source: ABCA database (2002)	

In addition to the fish species listed in **Table 9**, anecdotal fish community information from ABCA indicates that other species are also present in Parkhill Creek near Grand Bend. This information is shown on **Table 10**.

Table 10: Anecdotal Fish Species List for Parkhill Creek near Grand Bend

Common Name	Scientific Name
chinook salmon	*Oncorhynchus tshawytscha*
rainbow trout	*Oncorhynchus mykiss*
northern pike	*Esox lucius*
walleye	*Stizostedion vitreum*
freshwater drum	*Aplodinotus grunniens*
channel catfish	*Ictalurus punctatus*
Source: Angela Baitz, ABCA, Personal Communication, Feb. 15, 2008	

The list includes lake-dwelling predatory fish species that may enter the downstream reach of Parkhill Creek from Lake Huron.

There is no historical fish community data for the Shipka Drain.

Benthic Community

Benthic invertebrates are small animals without backbones that live in stream or lake sediments. Benthic invertebrate communities are well suited for use as biomonitoring tools because different benthic organisms have differing sensitivities to environmental stressors and can provide insight into the level of human impacts on the aquatic system.

The Family Biotic Index (FBI) summarizes information on the numbers and types of benthic invertebrates in a sediment sample. FBI values indicate stream health, with values ranging from 1 (healthy) to 10 (degraded). Based on a FBI score of 5.6, the Lower Parkhill Creek benthic community was graded as "fair."

3.8 Species at Risk

In March of 2004, the Ausable River Recovery Team completed a Recovery Strategy to define actions required to protect and recover aquatic species at risk in the Ausable Basin. In summary, the watershed contains seven (7) fish, four (4) freshwater mussel, and three (3) reptile species that currently are protected under the *Species at Risk Act*. These species are shown on **Table 11**.

Table 11: Aquatic Species at Risk in the Ausable River

Common Name	Scientific Name	Provincial Rank	COSEWIC Status
FISH			
greenside darter	*Etheostoma blennioides*	S4	Special Concern
black redhorse	*Moxostoma duquesnei*	S2	Threatened
river redhorse	*Moxostoma carinatum*	S2	Special Concern
lake chubsucker	*Erimyzon sucetta*	S2	Threatened
eastern sand darter	*Ammocrypta pellucida*	S2	Threatened
pugnose shiner	*Notropis anogenus*	S2	Endangered
bigmouth buffalo	*Ictiobus cyprinellus*	SU	Special Concern
MUSSELS			
northern riffleshell	*Epioblasma torulosa rangiana*	S1	Endangered
Snuffbox	*Epioblasma triquetra*	S1	Endangered
wavy-rayed lampmussel	*Lampsilis fasciola*	S1	Endangered
Kidneyshell	*Ptychobranchus fasciolaris*	S1	Endangered
REPTILES			
queen snake	*Regina septemvittata*	S2	Threatened
eastern spiny softshell turtle	*Apalone spinifera spinifera*	S3	Threatened
map turtle	*Graptemys geographica*	S3	Special Concern
S1 – Extremely rare in Ontario S2 – Very rare in Ontario S3 – Rare to uncommon in Ontario S4 – Common and apparently secure in Ontario SU – Uncertain rank			

According to the Lower Parkhill Watershed Report Card, only river redhorse is known to occur in Parkhill Creek and no rare aquatic mussels are known to inhabit the watercourse. No aquatic element occurrences are indicated directly on or immediately adjacent to the Study Area based on a review of the NHIC database.

3.9 Terrestrial Resources

The Grand Bend STF site is near the northern boundary of the Carolinian Deciduous vegetation zone. The Boundary Zone, a narrow band between the Deciduous and Mixed Woods zone, is just north of the Grand Bend STF site. As a result, the lands surrounding the STF have species from both the northern and southern regions. Southern species such as oak, hickory, tulip, sassafras, hop-tree, hackberry, magnolia and chinquapin oak are some of the species that have spread into this area. Northern species include hardwoods, such as sugar maple, white elm, yellow birch and red oak. The softer woods are represented by white pine, red pine, hemlock, spruce and balsam fir. Conifers in wetter areas include eastern white pine, tamarack, eastern red cedar and eastern hemlock.

Lands surrounding the Grand Bend STF are dominated by agricultural uses, with common crops (i.e. corn) to the east and north, and an active cattle pasture, within the site property south of the Shipka Drain. To the west, the landscape is dominated by the lowlands and floodplain of Lower Parkhill Creek. The Shipka Drain is located along the southern boundary of the facility, within the pasture, and receives treated effluent when the lagoons are seasonally discharged.

The STF site has been extensively modified due to the construction of the lagoon cells in the 1970s and subsequent upgrades. As a result, all of the on-site vegetation has either been planted or "self seeded" from local sources. The outside slopes of all lagoon cells have been seeded with a pasture mix consisting of tall fescue (*Festuca arundinacea*), red fescue (*F. rubra)*, red clover (*Trifolium pratense*), birdsfoot trefoil *(Lotus corniculatis*), Kentucky bluegrass *(Poa pratensis)* and perennial rye (*Lolium perenne).* Other common plants include teasel, sweet white clover (*Melilotus alba*), sweet yellow clover *(M. Officinalis)*, common reed grass (*Phragmites communis)*, reed canary grass (*Phalaris arundinacea*), daisy fleabane *(Erigeron annuus)*, blueweed *(Echium vulgare*), common plantain *(Plantago major)* and prostrate knotweed (*Polygonum aviculare*). **Table 12** lists the plants found during site visits in 1992 and 2008.

The site has a limited amount of woody cover, but a scattered hedgerow of planted white cedar (*Thuja occidentalis)* occurs along the northern boundary. Red ash *(Fraxinus pennsylvanica),* cottonwood (*Populus deltoides*) and black walnut (*Juglans nigra)* trees have been planted to the west of Lagoon Cell No. 4.

The lagoon cells are numbered from 1 to 4 (from Parkhill Creek to Mollard Line). The inside slopes of Lagoon Cells 3 and 4 have no woody cover, but scattered shrubs of red ash, sandbar willow (*Salix exigua*), autumn olive and white elm (*Ulmus americana*) can be found in Lagoons Cell Nos. 1 and 2. Since Lagoon Cells 1 and 2 are usually only half- filled with effluent, the side slopes are now covered in a thick cover of cocklebur and water smartweed *(Polygonum amphibium*).

Wildlife Communities

Since the site is located in an agricultural area and has a constant source of water, wildlife activity in the area was high with tracks or scat of several species, including raccoon, white-tailed deer, coyote, eastern cottontail and groundhog observed in the mudflats surrounding Lagoon Cells 1 and 2 near the outfall structures along the southern perimeter. Leopard frogs were also noticed swimming along the edges of all lagoons or foraging within the long grass around the site limits.

Table 12:
Master List of Vascular Plants Observed in Grand Bend Lagoons
Field Dates – June 10, 11, 12, 1992 and October 21, 2008

Family	Scientific Name	Common Name	Status N = Native I = Introduced	Site
EQUISETACEAE	*Equisetum arvense*	Field Horsetail	N	✓
CUPRESSACEAE	*Juniperus virginiana*	Red Cedar	N	✓
	Thuja occidentalis	White Cedar	N	✓
ARACEAE	*Arisaema triphyllum*	Jack-in-the-pulpit	N	✓
CYPERACEAE	*Scirpus validus*	Soft-stem Bulrush	N	✓
GRAMINEAE	*Agropyron repens*	Quack grass	I/N	✓
	Agrostis gigantean	Redtop	I	✓
	Festuca arundinacea	Tall Fescue	I/N	✓
	Lolium perenne	Perennial Rye Grass	I	✓
	Panicum capillare	Witch Grass	N	✓
	Phalaris arundinacea	Reed Canary Grass	N	✓
	Phragmites australis	Common Reed	N	✓
IRIDACEAE	*Iris versicolor*	Wild Blue Flag	N	✓
LEMNACEAE	*Lemna minor*	Common Duckweed	N	✓
LILIACEAE	*Asparagus officinalis*	Garden Asparagus	I	✓
	Trillium grandiflorum	White Trillium	N	✓

Family	Scientific Name	Common Name	Status N = Native I = Introduced	Site
TYPHACEAE	*Typha angustifolia*	Narrow-leaved Cattail	N	✓
	Typha latifolia	Common Cattail	N	✓
ACERACEAE	*Acer negundo*	Manitoba Maple	N	✓
	Acer rubrum	Red Maple	N	✓
	Acer saccharinum	Silver Maple	N	✓
	Acer saccharum	Sugar Maple	N	✓
ANACARDIACEAE	*Rhus typhina*	Staghorn Sumach	N	✓
ASCLEPIADACEAE	*Asclepias incarnate*	Swamp Milkweed	N	✓
	Asclepias syriaca	Common Milkweed	N	✓
BALSAMINACEAE	*Impatiens capensis*	Spotted Jewelweed	N	✓
BERBERIDACEAE	*Podophyllum peltatum*	May-apple	N	✓
BORAGINACEAE	*Cynoglossum Officinale*	Hounds Tongue	I	✓
	Echium vulgare	Blueweed	I	✓
CAPRIFOLIACEAE	*Sambucus Canadensis*	Common Elder	N	✓
CARYOPHYLLACEAE	*Cerastium fontanum*	Mouse-eared Chickweed	I	✓
	Saponaria officinalis	Bouncing Bet	I	✓
	Silene latifolia	White Cockle	I	✓
COMPOSITAE	*Achillea millefolium*	Common Yarrow	N/I	✓
	Ambrosia artemisiifolia	Common Ragweed	N	✓
	Ambrosia trifida	Giant Ragweed	N	✓
	Arctium minus	Burdock	I	✓
	Aster ericoides	Heath Aster	N	✓
	Aster novae-angliae	New England Aster	N	✓
	Cichorium intybus	Chicory	I	✓
	Cirsium vulgare	Bull Thistle	I	✓
	Erigeron philadelphicus	Philadelphia Fleabane	N	✓
	Hieracium caespitosum	Yellow Hawkweed	I	✓
	Prenanthes altissima	Tall White Lettuce	N	✓
	Solidago altissima	Late Goldenrod	N	✓
	Solidago caesia	Blue-stem Goldenrod	N	✓
	Taraxacum officinale	Common Dandelion	I	✓
	Xanthium strumarium	Cocklebur	N/I	✓
CONVOLVULACEAE	*Convolvulus arvensis*	Field Bindweed	I	✓
	Cuscuta gronovii	Common Dodder	N	✓
CORNACEAE	*Cornus alternifolia*	Alternate-leaved Dogwood	N	✓

Family	Scientific Name	Common Name	Status N = Native I = Introduced	Site
	Cornus foemina racemosa	Grey Dogwood	N	✓
	Cornus stolonifera	Red-osier Dogwood	N	✓
CRUCIFERAE	*Barbarea vulgaris*	Yellow Rocket	I	✓
	Hesperis matronalis	Dame's Rocket	I	✓
	Lepidium campestre	Field Pepper-grass	I	✓
	Nasturtium officinale	Water Cress	I	✓
DIPSACACEAE	*Dipsacus fullonum*	Teasel	I	✓
ELAEAGNACEAE	*Elaeagnus umbellate*	Autumn Olive	I	✓
FAGACEAE	*Quercus macrocarpa*	Bur Oak	N	✓
	Quercus rubra	Red Oak	N	✓
GERANIACEAE	*Geranium maculatum*	Wild Geranium	N	✓
GROSSULARIACEAE	*Ribes americanum*	Wild Black Currant	N	✓
JUGLANDACEAE	*Carya cordiformis*	Bitternut Hickory	N	✓
	Juglans nigra	Black Walnut	N	✓
LABIATAE	*Leonurus cardiaca*	Motherwort	I	✓
LEGUMINOSAE	*Medicago lupulina*	Black Medic	I	✓
	Medicago sativa	Alfalfa	I	✓
	Melilotus alba	White Sweet-clover	I	✓
	Melilotus officinalis	Yellow Sweet-clover	I	✓
	Trifolium repens	White Clover	I	✓
OLEACEAE	*Fraxinus Americana*	White Ash	N	✓
OXALIDACEAE	*Oxalis stricta*	European Wood-sorrel	N	✓
PLANTAGINACEAE	*Plantago lanceolata*	English Plantain	I	✓
	Plantago major	Broad-leaved Plantain	I	✓
POLYGONACEAE	*Polygonum aviculare*	Prostrate Knotweed	I	✓
	Rumex crispus	Curly Dock	I	✓
	Rumex obtusifolius	Bitter (Broad) Dock	I	✓
PRIMULACEAE	*Lysimachia ciliate*	Fringed Loosestrife	N	✓
	Lysimachia nummularia	Moneywort	I	✓
RANUNCULACEAE	*Anemone virginiana*	Tall Anemone	N	✓
	Ranunculus acris	Tall Buttercup	I	✓
	Ranunculus repens	Creeping Buttercup	I	✓
	Thalictrum dioicum	Early Meadow-rue	N	✓
RHAMNACEAE	*Rhamnus cathartica*	Purgine Buckthorn	N	✓
ROSACEAE	*Crataegus crus-galli*	Cockspur Hawthorn	N	✓

Family	Scientific Name	Common Name	Status N = Native I = Introduced	Site
	Crataegus punctata	Dotted Hawthorn	N	✓
	Fragaria virginiana	Common Strawberry	N	✓
	Geum aleppicum	Yellow Avens	N	✓
	Malus pumila	Apple	I	✓
	Prunus serotina	Wild Black Cherry	N	✓
	Rosa multiflora	Multiflora Rose	I	✓
	Rubus idaeus	Wild Red Raspberry	N	✓
SALICACEAE	*Populus alba*	White Poplar	I	✓
	Populus balsamifera	Balsam Poplar	N	✓
	Populus deltoids	Cottonwood	N	✓
	Populus tremuloides	Trembling Aspen	N	✓
	Salix fragilis	Crack Willow	I	✓
SOLANACEAE	*Solanum dulcamara*	Climbing Nightshade	I	✓
ULMACEAE	*Ulmus Americana*	White Elm	N	✓
UMBELLIFERAE	*Daucus carota*	Wild Carrot	I	✓
URTICACEAE	*Urtica dioica*	Stinging Nettle	N	✓
VITACEAE	*Parthenocissus inserta*	Virginia Creeper	N	✓

Scientific names according to:
Morton, J.K. and J.M. Venn. 1990. A Checklist of the Flora of Ontario Vascular Plants. University of Waterloo Biology Series No. 34.

During Dillon's site visit in October 2008, a large number of migratory and resident waterfowl was observed swimming in all four lagoons or resting on the grass adjacent to the cells (see **Table 13**). This observation is not surprising. Sewage lagoons often attract birds in large numbers as the habitat is usually warmish, open water; has a great deal of insect life; often has submergent, emergent and/or free floating vegetation and has surrounding manicured or low growing plant material that does not conceal predators or hunters.

A review of the ONTBIRDS website's weekly birding reports from January 3, 2005 to October 27, 2008 found that the Grand Bend sewage lagoons are visited by bird enthusiasts. **Table 13** lists species observed by the enthusiasts. Other species are likely, but opportunities for on-site breeding are limited.

During a site visit by Dillon's biologist in June 1992, Lagoon Cell No. 1 had been drained and the remnants (i.e., bones) of many large carp were observed stranded in the mud. Similarly, in 2008, bones and skulls of carp were also found scattered around the slopes of Lagoons 1 and 2.

It was very likely that animals such as raccoon, crows, and other scavengers had moved this material around.

While birds and wildlife do visit lagoons, they are not considered to be a "natural environment". According to CCME (2006), raw municipal wastewater (depending on the level of treatment) typically contains human and other organic waste, nutrients (i.e., nitrogen and phosphorous), pathogens, microorganisms, suspended solids and household and industrial chemicals. These compounds and organisms can be consumed by foraging wildlife. Adverse impacts can include tumours, organ damage, physical deformities, behavioural changes, reproduction disorders and population decline. These compounds and organisms can also be excreted by wildlife on nearby beaches, farm fields and grasslands, thus increasing the potential of transmission to humans.

Table 13: Bird species observed at Grand Bend STF October 2008

Scientific Name	Common Name	Notes	COSEWIC	COSSARO	G rank	S rank
Actitis macularia	Spotted Sandpiper	Observed – lagoons	NAR	NAR	G5	S5B, S2N
Agelaius phoeniceus	Red-winged Blackbird	Observed – nesting	NAR	NAR	G5	S5B, S2N
Aix sponsa	Wood duck	Pair swimming in Parkhill Creek	NAR	NAR	G5	S5B,SZN
Anas platyrhynchos	Mallard	Observed several pairs	NAR	NAR	G5	S5B, S2N
Ardea Herodias	Great Blue Heron	Within Parkhill Creek	NAR	NAR	G5	S5B, S2N
Aythya valisineria	Canvasback	Swimming in lagoon	NAR	NAR	G5	S1B,SZN
Bombycilla cedrorum	Cedar waxwing	Observed foraging	NAR	NAR	G5	S5
Branta canadensis	Canada Goose	Observed. Feeding on grass or in corn fields. 100s flew over site. old nest	NAR	NAR	G5	S5B, S2N
Bucephala albeola	Bufflehead	Many individuals on all four lagoons	NAR	NAR	G5	S3B, SZN
Buteo jamaicensis	Red-tailed hawk	Observed flyover (2)	NAR	NAR	G5	S5
Butorides striatus	Green heron	Observed pair, lagoon	NAR	NAR	G5	S4B, S2N
Cardinalis cardinalis	Northern Cardinal	Calling – Parkhill Creek (1)	NAR	NAR	G5	S5
Carduelis tristis	American Goldfinch	Observed – hedgerow (6)	NAR	NAR	G5	S5B, S2N
Charadrius vociferus	Killdeer	Observed – lagoon area mudflats(3+)	NAR	NAR	G5	S5B, S2N
Cistothorus palustris	Marsh Wren	Calling –	NAR	NAR	G5	S5B, S2N

Scientific Name	Common Name	Notes	COSEWIC	COSSARO	G rank	S rank
Columba livia	Rock Dove	Fly over (2)	NAR	NAR	G5	SE
Corvus brachyrhynchos	American crow	Observed flyover (4)	NAR	NAR	G5	S5
Cyanocitta cristata	Blue jay	Observed, Parkhill Creek (2)	NAR	NAR	G5	S5
Dendroica coronata	Yellow-rumped warbler	Parkhill Creek area	NAR	NAR	G5	S5B,SZN
Dumetella carolinensis	Grey catbird	Calling near Lagoon 4	NAR	NAR	G5	S5
Hirundo rustica	Barn Swallow	Flyover, entire site (5+)	NAR	NAR	G5	S5B, S2N
Larus philadelphia	Bonapartes Gull	Many individuals see in October, 2008	NAR	NAR	G5	S4B, SZN
Leterus galbula	Northern oriole	Observed pond area (4)	NAR	NAR	G5	S5B, S2N
Melanitta nigra	Black scoter	Many individuals seen in October, 2008	NAR	NAR	G5	SZN,SUB
Melospiza melodia	Song Sparrow	Calling oldfield (2)	NAR	NAR	G5	S5B, S2N
Passer domesticus	House sparrow	Many individuals (20+)	NAR	NAR	G5	SE
Picoides pubescens	Downy Woodpecker	Observed, Parkhill Creek pond area (2)	NAR	NAR	G5	S5
Sitta canadensis	Red-breasted nuthatch	Parkhill Creek area	NAR	NAR	G5	S5B, SZN
Spizella passerina	Chipping Sparrow	Calling, observed (6)	NAR	NAR	G5	S5B, S2N
Tachycineta bicolor	Tree Swallow	Flyover, wetland (10+)	NAR	NAR	G5	S5B, S2N
Turdus migratorius	American Robin	Observed hedgrerow (5)	NAR	NAR	G5	S5B, S2N
Zenaida macroura	Mourning Dove	Nesting entire site (8)	NAR	NAR	G5	S5B, S2N

Note: NAR = Not at risk

Table 14: Lists of Birds at Grand Bend Lagoons, Ontario Bird website

Scientific Name	Common Name	Notes	COSEWIC	COSSARO	G rank	S rank
Anas crecca	Green-winged teal		NAR	NAR	G5	S4B, SZN
Aythya collaris	Ringed-necked duck		NAR	NAR	G5	S5B, SZN
Branta canadensis	Canada goose		NAR	NAR	G5	S5B, SZN
Calidris alpina	Dunlin		NAR	Sensitive	G5	S3B, SZN
Calidris bairdii	Bairds sandpiper		NAR	Undetermined	G5	SZN
Calidris ferruginea	Curlew sandpiper		NAR	NAR	G5	SAN
Calidris minutilla	Least sandpiper		NAR	NAR	G5	S4B, SZN
Carus minutus	Little gull		NAR	May be at risk	G5	S1SZB, SZN
Charadrius vociferous	Killdeer		NAR	NAR	G5	S5B SZN
Charadrivs semipalmatus	Semi-palmated plover		NAR	NAR	G5	S3B, SZN
Chen caerulescens	Snow goose		NAR	NAR	G5	S4B, SZN
Dolichonyx oryzivorus	Bobolink		NAR	NAR	G5	S4B, SZN
Fulica Americana	American coot		NAR	NAR	G5	S4B, SZN
Gallinago gallinago	Common snipe		NAR	NAR	G5	S5B, SZN
Larus Philadelphia	Bonapartes gull		NAR	NAR	G5	S4B SZN
Limnodromus griseus	Short-billed dowitcher		NAR	Sensitive	G5	S2S3B, SZN
Limosa haemastica	Hudsonian godwit		NAR	May be at risk	G4	S2S3B, SZN
Lophodytes cugullatus	Hooded merganser		NAR	NAR	G5	S5B, SZN
Mergus merganser	Common merganser		NAR	NAR	G5	S5B, SZN
Oxyura jamaicensis	Ruddy duck		NAR	May be at risk	G5	S2B, SZN
Phalaropus tricolour	Wilson's phalarope		NAR	Sensitive	G5	S3B, SZN
Podiceps nigricollis	Eared grebe		NAR	NAR	G5	SZB, SZN
Recurvirostra Americana	American avocet		NAR	NAR	G5	SZB, SZN
Tringa flavipes	Greater yellow legs		NAR	NAR	G5	S4B, SZN

Note: NAR = Not at risk

3.10 Existing and Future Land Uses

3.10.1 Existing Land Uses

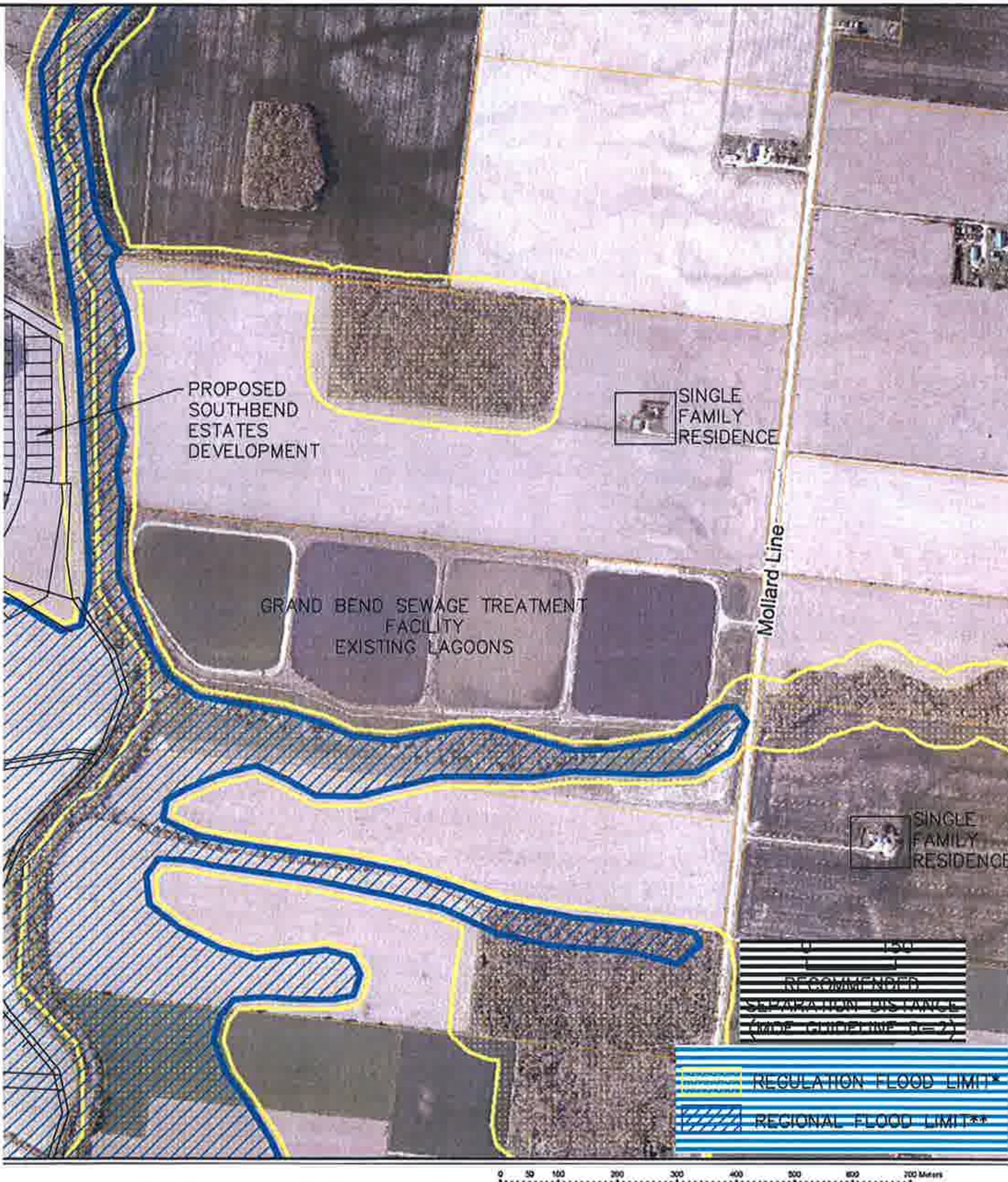
As mentioned, the Grand Bend STF is located in a primarily agricultural area on Mollard Line in South Huron. Two farm related single-family houses are located in the vicinity of the STF, as shown on **Figure 5**. One is located on the west side of Mollard Line, approximately 265 metres north of the northern edge of Lagoon Cell No. 4. The other is located on the east side of Mollard Line, approximately 350 metres southeast of Lagoon Cell No. 4.

The lowlands and floodplain of Parkhill Creek are located west of the STF. The proposed Southbend Estates development, a residential community with almost 600 units centred around a golf course, is located further west, across Parkhill Creek.

3.10.2 Official Plans and Zoning By-law

The Municipality of South Huron Official Plan designates the Grand Bend STF site and surrounding area as “Agriculture”. Infrastructure and utilities, such as sewage treatment plants, are permitted in the “Agriculture” area. The Shipka Drain and Parkhill Creek are designated “Natural Environment (River, Creek)” and are part of a large area designated “Klondyke Special Policy Area”. The Policy Area includes lands lying below the 180.65 metre common Regional Storm flood elevation. According to the plan, the intent of this designation is to recognize the Klondyke as a “developing and intensifying agricultural district”, while recognizing flooding hazards.

The Grand Bend STF site is zoned “Disposal (DS) Zone” on Key Map 57 to the Township of Stephen Zoning By-law (South Huron is currently updating the by-law). Sewage treatment works are permitted in the DS Zone, subject to applicable MOE regulations. Lands adjoining Parkhill Creek on the western edge of the site are zoned “Natural Environment (NE1) Zone” and “Klondyke Special Policy Area (SP1) Zone”. All new buildings in the SP1 Zone must conform to the ABCA’s flood-proofing standards or be located at a higher elevation than the regional storm flood level of 180.7 metres.



* The Regulation Limit was prepared for use in conjunction with Ontario Regulation 147/06 and was determined from available studies, information and mapping. Please refer to the text of the regulation for a full legal description of all regulated lands. The Regulation Limit depicted on this map is subject to change Property boundaries are a representation only and are not a legal survey.

**Flood limits are representative only. Please refer to Flood Study to determine flood elevation.*

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DILLON CONSULTING

Grand Bend Sewage Treatment Facility Expansion and Upgrade Class Environmental Assessment

FIGURE 5: EXISTING LAND USES

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

Lands across Parkhill Creek in the Municipality of Lambton Shores are designated "Hazard and Environmental Protection" (floodplain of Parkhill Creek) and "Residential" (future Southbend Estates) in the Lambton Shores Official Plan. Section 22.7.1 of the Official Plan includes policies for buffers around "Sewage Lagoons". The plan states that "new residential development and other sensitive land uses will not be permitted within 100 metres of any existing sewage lagoons within the Municipality or an adjoining municipality, in order to provide an odour buffer."

Relevant Schedules from the Official Plans and the Zoning By-law are included in **Appendix D**.

3.10.3 Provincial Policies

Provincial Policy Statement

The *Planning Act* requires that any municipal decisions affecting a planning matter "shall be consistent with" the Provincial Policy Statement (PPS) issued in 2005. As required by the PPS, municipalities shall ensure that sewage services are provided in a manner that:

- can be sustained by the water resources upon which such services rely
- is financially viable and complies with all regulatory requirements
- protects human health and the environment
- promotes water conservation and water use efficiency
- integrates servicing and land use considerations in all stages of the planning process.

Infrastructure and public service facilities shall be provided in a coordinated, efficient and cost-effective manner to accommodate projected needs. The PPS also requires that planning for these facilities shall be integrated with planning for growth to meet current and projected needs.

MOE Guideline D-2: Compatibility between Sewage Treatment and Sensitive Land Use

Guideline D-2 applies to all Certificate of Approval applications for new and expanding municipal and private sewage treatment facilities. The Guideline includes recommended separation distances and other control measures to minimize the impact of odours and noise on "sensitive land uses" adjacent to municipal and private sewage treatment facilities. "Sensitive land uses" are defined in Procedure D-1-3 and include residential, institutional, certain recreational uses and some agricultural operations, including cattle raising, cash crops and orchards.

The Guideline recommends that adequate land surrounding a proposed facility or buffer zone be acquired as part of a plant expansion and upgrade. When acquisition is not possible, future sensitive uses on adjacent lands should be discouraged through appropriate Official Plan and Zoning By-law constraints. More effective noise and odour control mitigation is also required to provide an optimum level of protection between the STF and adjacent sensitive land uses.

The following separation distances from sensitive land uses are required by Guideline D-2 for sewage treatment plants with a capacity from 500 m^3/d to 25,000 m^3/d, including the expanded and upgraded Grand Bend STF:

- Minimum separation distance of 100 metres
- Recommended separation distance of 150 metres, as shown on **Figure 5**

The separation distance is measured from the periphery of the noise/odour-producing source/structure, to the property/lot line of the sensitive land use.

4. DESIGN OPTIONS

4.1 Design Criteria

4.1.1 Projected Population and Sanitary Sewage Flows

The expansion and upgrade of the Grand Bend STF has been designed to treat projected sanitary sewage flows for the year 2031, as summarized in Section 3.3 of this ESR.

4.1.2 Project Phasing

The full build-out of the Grand Bend STF could be completed in phases. The Service Area for the expanded and upgraded Grand Bend STF will be confirmed by the individual Class EA projects for the collection systems to be undertaken by the three municipalities.

Financing of the Grand Bend STF expansion and upgrade was calculated for the ultimate build-out (2031) of the plant to service the entire Study Area.

4.1.3 Effluent Criteria

Proposed effluent discharge limits and objectives were presented to MOE at a meeting held on March 19, 2008, based on Dillon's assessment of background receiver information. The effluent criteria were considered reasonable by MOE for the STF expansion and upgrade.

Proposed effluent objectives and limits for a future plant expansion are shown on **Table 15**. Effluent objectives and non-compliance limits are based on the average of monthly concentration data. The loadings shown on **Table 15** correspond to the loading under the ultimate 2031 annual average day flow.

Table 15:
Grand Bend STF Effluent Concentration & Loading Objectives and Non-Compliance Limits (Corresponding to a Rated Capacity of 4,659 m^3/d)

	Concentration		Loading
Parameter	**Effluent Objective**	**Effluent Non-Compliance Limit**	**Effluent Non-Compliance Limit**
BOD	5 mg/L	10 mg/L	17,005 kg/year
TSS	5 mg/L	10 mg/L	17,005 kg/year
Ammonia-Nitrogen	summer: 1 mg/L winter: 2 mg/L	summer: 2 mg/L winter: 4 mg/L	summer: 3,401 kg/year winter: 6,802 kg/year
Total Phosphorus	0.1 mg/L	0.15 mg/L	255 kg/year
Escherichia Coli (monthly geometric mean density)	100 organisms/100mL	150 organisms/100mL	--

A monitoring program will likely be included in the MOE Certificate of Approval for the upgraded Grand Bend STF to monitor the water quality in Parkhill Creek, upstream and downstream of Shipka Drain. Such a program will likely be required for two to three years once the plant is operational, to assess any impacts associated with the discharge from the expanded plant. The monitoring program will probably include water quality parameters such as Total Suspended Solids (TSS), five-day Biochemical Oxygen Demand (BOD_5), Total Phosphorus (TP), and Total Kjeldahl Nitrogen (TKN), as well as benthic invertebrates. By comparing the historical water quality data in Parkhill Creek to the data collected through the monitoring program, any improvements in water quality will be verified.

4.1.4 Treatment Process Components

The expanded and upgraded Grand Bend STF requires certain process components to ensure that the plant can meet the effluent criteria presented in Section 4.1.3. The following treatment process components will be required to ensure that effluent quality is met:

- Inlet works or headworks:
    - Screening to remove large solids
    - Potentially grit removal

- Biological treatment:
    - Removal of organic material through oxidation of dissolved and particulate biodegradable constituents
- Secondary clarification (potentially)
- Tertiary filtration:
    - Further treatment to ensure effluent meets criteria for Total Suspended Solids and Total Phosphorus
- Ultraviolet (UV) irradiation disinfection:
    - Removal of microbial contaminants before effluent is discharged to Shipka Drain/Parkhill Creek.

4.2 Sustainable Design Concepts

Various sustainable design concepts were considered for incorporation into the expansion and upgrade of the Grand Bend STF. The following concepts were evaluated for the project:

- reduce energy consumption and provide energy efficient process design through:
    - recovery of heat from effluent
    - recycling of blower waste heat
- provide an innovative approach to sludge management
- reduce energy demand from the grid through onsite renewable source(s) of power, including:
    - solar photovoltaic (PV) system
    - wind turbine system
    - bioenergy/biogas system
    - geothermal system.

A Sustainable Design Feasibility Study was completed to evaluate and identify the preferred sustainable design components to be included in the expansion and upgrade of the STF. The report on the study is included in **Appendix B**.

4.3 Expansion and Upgrade Alternatives

4.3.1 Alternative 1: Lagoon Upgrade – New Hamburg Process

Figure 6 is a site plan for an upgrade to the Grand Bend STF using the New Hamburg process.

The New Hamburg Process is an alternative process to conventional lagoon treatment, and consists of aerated or facultative lagoons, with the lagoon effluent sprayed intermittently over sand filters. The New Hamburg Process results in significant improvement in effluent quality, in comparison to a conventional lagoon treatment process. The concept was first introduced in the community of New Hamburg, Region of Waterloo, Ontario.

The New Hamburg Process considered for the lagoon upgrade consists of screening and aeration of raw sewage, facultative polishing and storage of pre-treated sewage, seasonal filtration of effluent using intermittent slow sand filters, and UV disinfection. As shown on **Figure 6**, this alternative involves the purchase of additional land to accommodate a sludge containment wetland, new facultative lagoon cell, aerated lagoon, and intermittent sand filter.

4.3.2 Alternative 2: Lagoon Upgrade – Wetland/Natural Treatment

A site plan for this alternative is shown on **Figure 7**. A wetland/natural treatment system considered for the lagoon upgrade consists of a conventional engineered wetland or a controlled wetland, such as a proprietary wetland system. Conventional engineered wetlands and certain proprietary systems generally consist of one or more vegetated shallow basins or channels, with a barrier to prevent seepage, and soil to support emergent vegetation. The root systems of the vegetation provide the surface for microbial activity required for wastewater treatment. As shown on **Figure 7**, additional land is required for the sludge containment wetland and conventional engineered wetland.

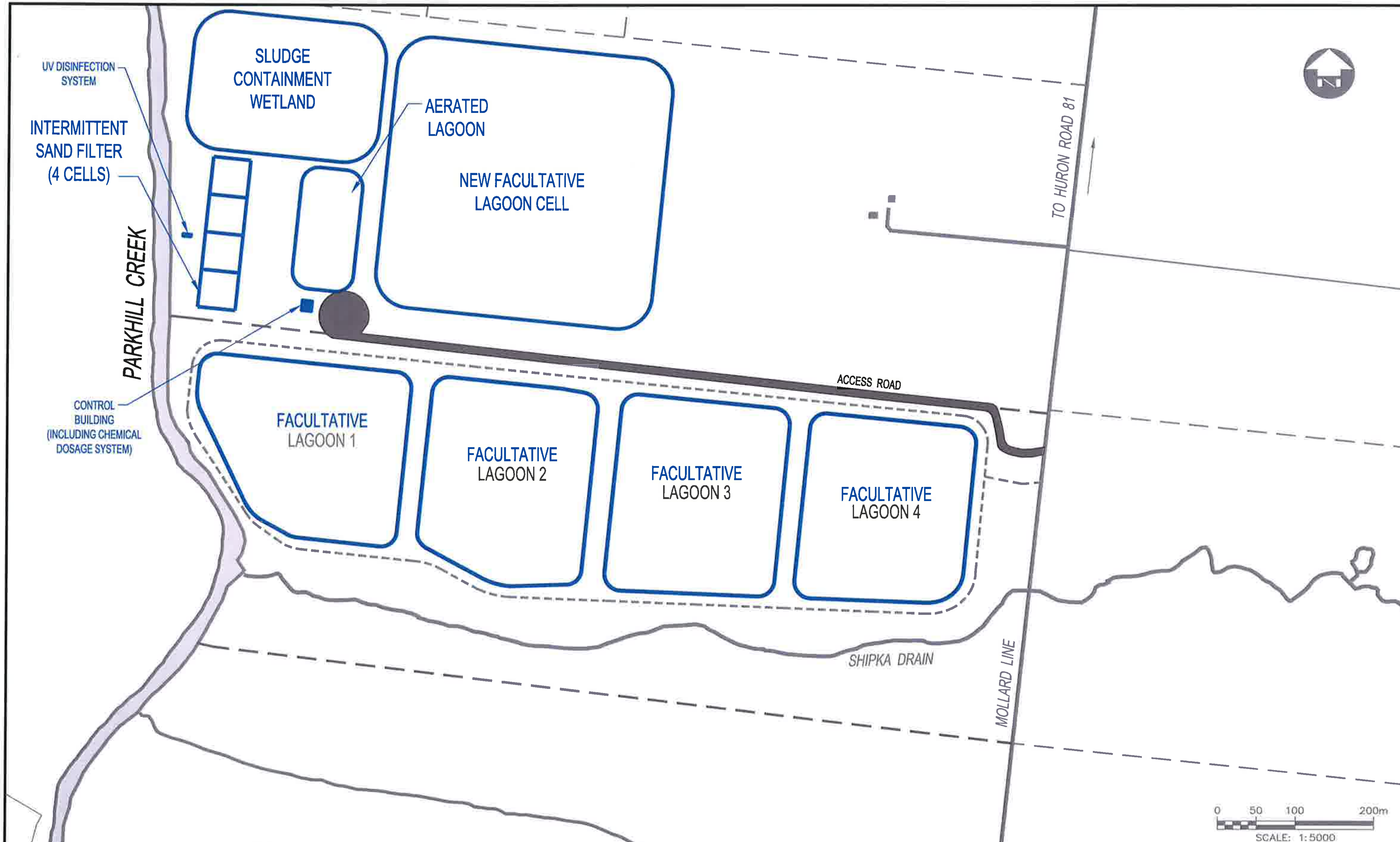

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FIGURE 6: LAGOON UPGRADE - NEW HAMBURG PROCESS SITE PLAN

Lambton Shores | Municipality of South Huron | Municipality of Bluewater 2001

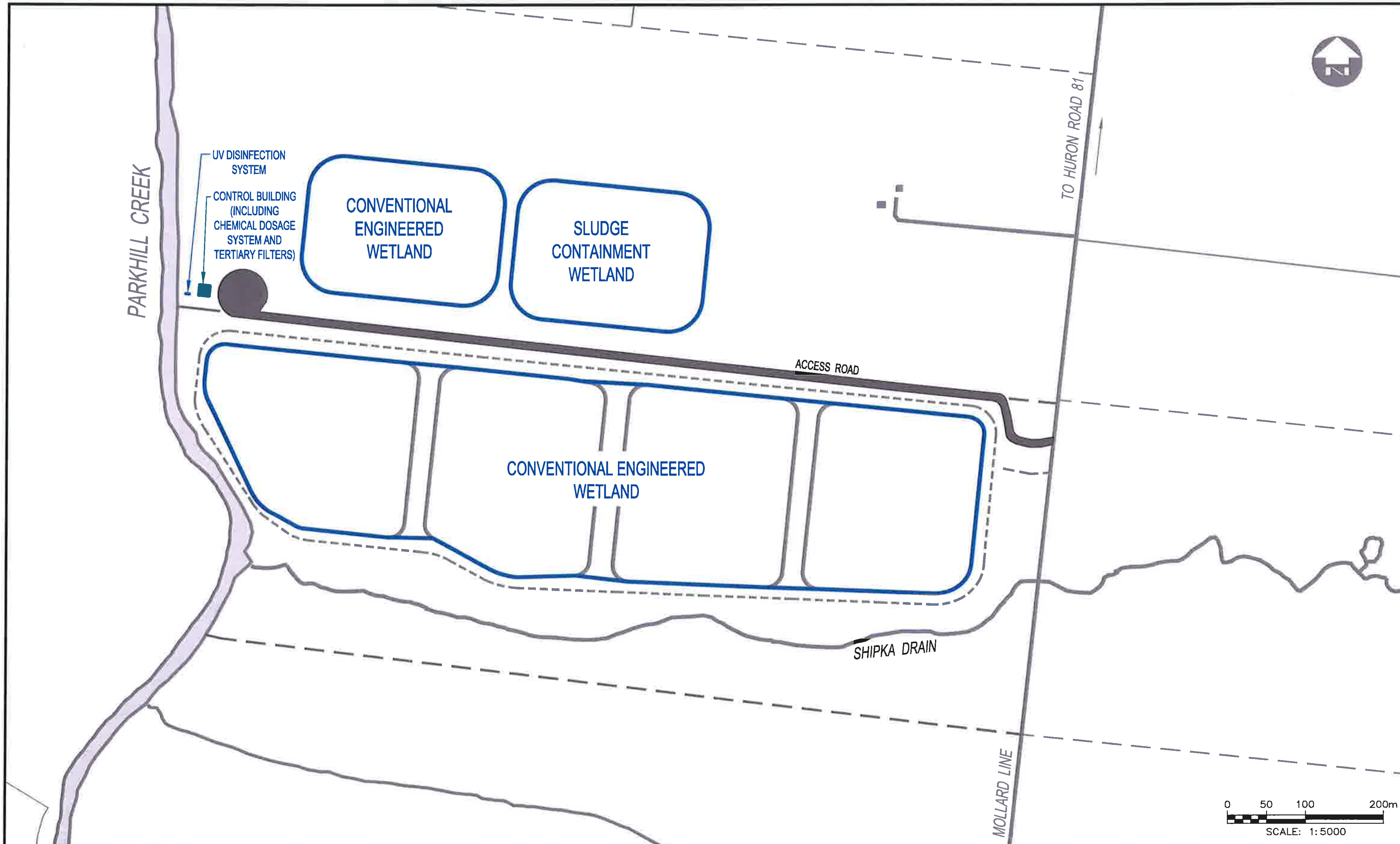

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FIGURE 7: LAGOON UPGRADE - WETLAND / NATURAL TREATMENT SYSTEM SITE PLAN

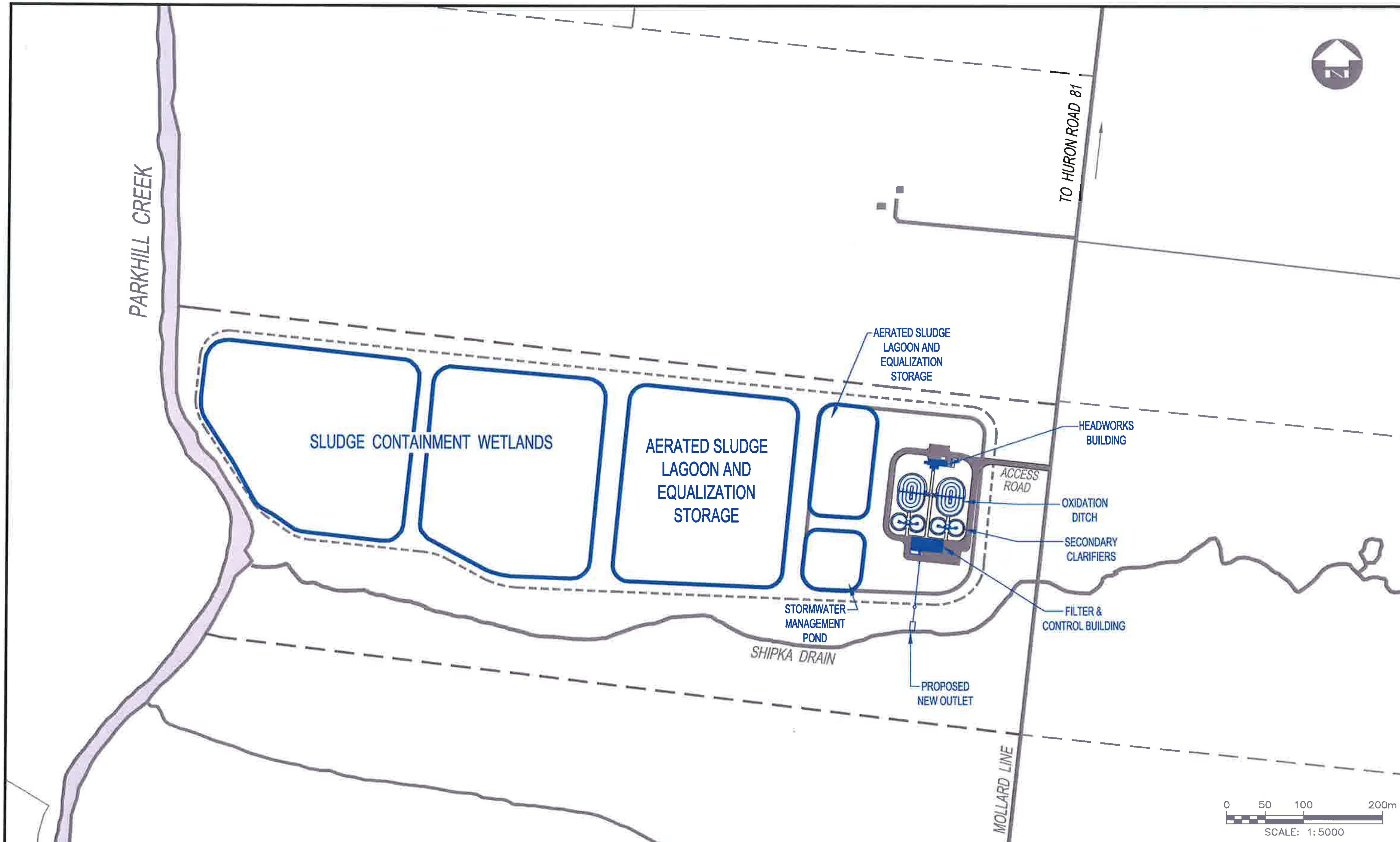

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FIGURE 8: MECHANICAL TREATMENT PLANT UPGRADE SITE PLAN

There are two types of conventional engineered wetland systems:

- free water surface systems: water surface is exposed to the atmosphere
- subsurface flow systems: includes porous media (usually gravel) with the water surface maintained at, or below, the media surface (reducing the potential for freezing in the winter).

This natural treatment process is followed by tertiary filtration and UV disinfection.

4.3.3 Alternative 3: Mechanical Treatment Plant Upgrade

Figure 8 shows a site plan for a mechanical treatment plant upgrade at the Grand Bend STF.

This alternative requires decommissioning the lagoon system so that a mechanical treatment plant can be constructed. A mechanical treatment process includes modular individual unit processes configured in series. The treatment system may include one or more process trains, consisting of various tankage and equipment, to treat wastewater flows. A mechanical treatment plant for the Grand Bend STF will include headworks processes, including screening and grit removal, a biological treatment process, tertiary filtration, and disinfection. A sludge management and treatment system is also required to handle the lagoon sludge dredged from the former lagoons, and sludge generated through the mechanical treatment processes.

Table 16:
Comparative Evaluation of Expansion and Upgrade Alternatives 1, 2 and 3

Evaluation Factors & Indicators	**Alternative 1 Lagoon Upgrade New Hamburg Process**	**Alternative 2 Lagoon Upgrade Wetland/Natural Treatment**	**Alternative 3 Mechanical Treatment Plant Upgrade *Recommended***	**Preferred Alternative**
Description				
Treatment Process Description	Existing lagoons modified and expanded to provide modified lagoon treatment known as New Hamburg process	Existing lagoons modified and expanded to either conventional engineered wetland or controlled wetland, such as a proprietary wetland system	Existing lagoons decommissioned and replaced with mechanical treatment plant	--
Service & Reliability				
Flexibility of Service	Process can handle variable flows, but process flexibility limited by storage and retention time	Same as Alternative 1	Process can handle variable flows and loading rates. Highly flexible with no limitations	Alternative 3
Reliability of Service	Provides reliable treatment, but chemical precipitation is required for reliable removal of phosphorus	May not provide reliable year-round ammonia removal by nitrification due to cold climate. Can be addressed by : - covering lagoon cells (Lemna proprietary wetland system) - adding attached growth media. Chemical precipitation required for reliable phosphorus removal. Considered an innovative technology (limited use in Ontario and Canada). Requires MOE monitoring for 3 years before effluent can be discharged – limits development in Study Area	Provides reliable treatment with no limitations	Alternative 3

Evaluation Factors & Indicators	**Alternative 1 Lagoon Upgrade New Hamburg Process**	**Alternative 2 Lagoon Upgrade Wetland/Natural Treatment**	**Alternative 3 Mechanical Treatment Plant Upgrade *Recommended***	**Preferred Alternative**
Treatment Capacity (next 20 years)	Cannot be efficiently operated for treatment systems with larger capacities. Generally suitable for systems with flow capacities of less than about 3,000 m^3/day (less than Study Area's projected 20-year design flow)	Typically in Ontario, systems generally have flow capacities less than 1,500 m^3/day (less than Study Area's 20-year design flow)	Mechanical Treatment Plants can be effectively operated over a range of treatment capacities. Modular plant design allows treatment capacity to be increased in phases	Alternative 3
Ease of Construction, Operation & Maintenance (O&M)	Simple construction involving mainly civil/earthwork type activities. O&M simple due to simplicity of process, but less control over plant performance and effluent quality	Same as Alternative 1	Multi-disciplinary plant construction. More complex system to operate and maintain, but provides increased process flexibility and more consistent plant performance	Alternative 3
Land Use Compatibility				
Compatibility with adjacent/surrounding Existing & Planned Land Uses	New facilities displace: • farmhouse and buildings on Mollard Line • a significant amount of "prime agricultural land"	Same as Alternative 1	No additional land required	Alternative 3
Potential to Service Future Growth (beyond 20 years)	Due to technical limitations and costs, not suitable for beyond 20 year design horizon	Same as Alternative 1	Modular plant design allows for cost-effective future upgrades. No process components likely require decommissioning – can be used beyond 20 year design horizon	Alternative 3

Evaluation Factors & Indicators	**Alternative 1** **Lagoon Upgrade** **New Hamburg Process**	**Alternative 2** **Lagoon Upgrade** **Wetland/Natural Treatment**	**Alternative 3** **Mechanical Treatment Plant Upgrade** ***Recommended***	**Preferred Alternative**
Protection of Natural Environment				
Potential Loss/Adverse Impacts on Natural Environmental Features	No site specific features displaced. Any potential adverse impacts can be avoided/mitigated	Unreliable ammonia removal could cause adverse environmental impacts	No additional land required. Unused land can be returned to the environment by naturalization. Other potential adverse impacts can be avoided/mitigated	Alternative 3
Protection of Cultural, Socio-Economic Environment				
Potential Impacts on Cultural Resources	Additional land required affects more land with high archaeological potential	Same as Alternative 1	Minimizes potential impacts by affecting less land with archaeological potential	Alternative 3
Potential Impacts on Socio-Economic Environment	Greater potential for odour impacts from open lagoons	Same as Alternative 1	Plant's enclosed process components minimize impacts. Tankage can be covered for odour control	Alternative 3
Sludge Management				
Sludge Management Requirements	Requires dredging once every 10 years for further treatment and disposal. Sludge containment wetland provides sludge storage/treatment with natural habitat features	Same as Alternative 1	Existing lagoon sludge and sludge generated by plant requires handling and treatment. Sludge containment wetland provides sludge storage/treatment with natural habitat features	Alternative 3
Cost				
Relative Capital Costs	High to moderate capital costs of approximately $12 M (or potentially equivalent to mechanical treatment plant, depending on required lagoon upgrades). Additional land is an added cost	Moderate capital cost of approximately $9M Additional land is an added cost	High capital cost of approximately $24 M(potentially equivalent to Alternative 1) Costs could be phased in over time (i.e. 3 phases of plant expansion over 20 years)	Alternative 2

Evaluation Factors & Indicators	**Alternative 1** **Lagoon Upgrade** **New Hamburg Process**	**Alternative 2** **Lagoon Upgrade** **Wetland/Natural Treatment**	**Alternative 3** **Mechanical Treatment Plant Upgrade** ***Recommended***	**Preferred Alternative**
Relative Operating & Maintenance Costs	Higher O&M costs than existing lagoon system. Lower than mechanical treatment plant alternative	Same as Alternative 1	Higher O&M costs Costs could be reduced through innovative design features	Alternatives 1 & 2

4.4 Comparative Evaluation of Expansion and Upgrade Alternatives and Recommended Alternative

Table 16 is a comparative evaluation of Expansion and Upgrade Alternatives 1, 2 and 3.

As shown on **Table 16**, both Lagoon Upgrade Alternatives (Alternative 1, New Hamburg Process, and Alternative 2, Wetland/Natural Treatment) are not suitable for treatment systems with larger capacities. Alternative 1 is generally suitable for systems with flow capacities of less than about 3,000 m^3/day, which is less than the Study Area's projected design flow. Typically in Ontario, wetland/natural treatment systems (Alternative 2) generally have flow capacities less than 1,500 m^3/day, which is significantly less than the Study Area's design flow. Another significant disadvantage of Alternative 2 is that MOE requires three years of monitoring before effluent can be discharged.

Alternatives 1 and 2 have other disadvantages compared to Alternative 3 (Mechanical Treatment Plant Upgrade):

- both Alternatives 1 and 2 can handle variable flows, but process flexibility is limited by storage and retention time
- Alternative 2 may not provide reliable year-round ammonia removal, potentially causing adverse environmental impacts
- the additional land required for Alternatives 1 and 2 for new wetlands and lagoon cells displace a farmhouse and buildings and a significant amount of "prime agricultural land" on Mollard Line
- both alternatives have greater potential for odour impacts from the open lagoons.

Based on the evaluation of alternative treatment plant expansion and upgrade alternatives, Alternative 3, Mechanical Treatment Plant Upgrade was identified as the preferred alternative. Despite the higher capital and operating and maintenance costs, Alternative 3 is preferred for the following reasons:

- small footprint and does not require additional land
- process flexibility and capability to handle variable flows and loadings
- modular unit processes which would allow a phased upgrade
- can be more easily expanded and upgraded at the 20-year design horizon.

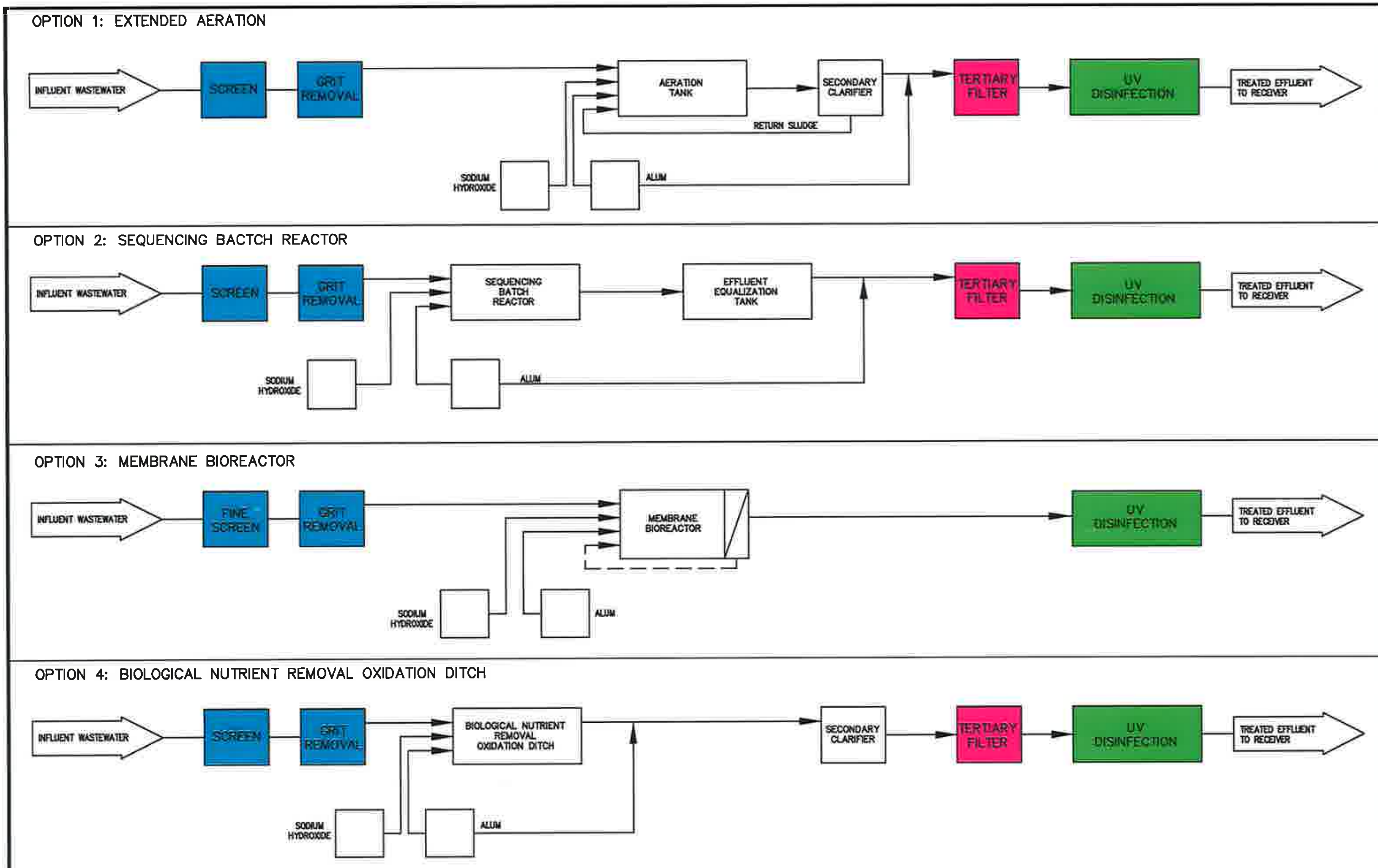

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FIGURE 9: MECHANICAL TREATMENT PLANT DESIGN OPTIONS
PROCESS FLOW SCHEMATICS (LIQUID TRAIN)

Lambton Shores

Municipality of South Huron

Municipality of BLUEWATER 2001

This evaluation confirms the Master Plan recommendation that the Grand Bend STF be upgraded from a lagoon system to a mechanical treatment plant.

4.5 Biological Treatment Options for Mechanical Treatment Plant

A mechanical treatment plant will include a biological treatment system. Various processes and technologies can provide this treatment. The following four biological treatment options were considered for a mechanical treatment plant upgrade:

- Option 1: Extended Aeration
- Option 2: Sequencing Batch Reactor
- Option 3: Membrane Bioreactor
- Option 4: Biological Nutrient Removal Oxidation Ditch.

Process flow diagrams for these options are shown on **Figure 9**.

The sludge generated by these treatment systems will be handled by a sludge management and treatment system, as outlined in Section 4.7.

4.5.1 Option 1: Extended Aeration

Headworks processes, including screening and grit removal, are required prior to this biological treatment process. The extended aeration process consists of an aeration tank and a secondary clarification tank. Tertiary filtration and ultraviolet (UV) disinfection is required following the biological treatment system.

This option consists of an aeration tank divided into parallel sections, with each section consisting of two compartments: an anoxic zone and an aerated zone. Wastewater entering the aeration tank is mixed in the anoxic compartment with return sludge pumped from the bottom of the secondary clarifiers. Sodium hydroxide is added to increase the alkalinity of the wastewater and alum is added to precipitate phosphorus. Aeration is provided by fine bubble diffusers.

Two secondary clarifiers would be provided to separate the biological solids from the treated effluent prior to discharge. The biological solids settle to the bottom of the clarifiers and are pumped back to the head of the aeration tank via pumps for sludge recirculation. The supernatant liquid undergoes further treatment prior to discharge, including tertiary filtration and UV disinfection. Additional alum is added prior to filtration to reduce the effluent phosphourus concentration of the discharge.

4.5.2 Option 2: Sequencing Batch Reactor (SBR)

Headworks processes, including screening and grit removal, are required prior to the SBR biological treatment process. Typically, a minimum of two SBR tanks are required.

Wastewater enters one of the SBR tanks, while the other tank undergoes consecutive treatment stages, such as aeration and decant/discharge. During the fill cycle, aeration is started and stopped to provide aerobic and anoxic conditions. Once the tank is filled, the react cycle begins. Sodium hydroxide is added to increase the alkalinity of the wastewater and alum is added to precipitate phosphorus. The tank contents are then aerated and mixed. A positive displacement blower and mixer provides aeration for each tank. Aeration may be shut off periodically during the react cycle. At the end of the react cycle, the aeration and mixing is shut off and the mixed liquor is settled. Approximately one third of the volume is decanted as clean supernatant for each cycle to an effluent equalization basin. The supernatant liquid undergoes further treatment prior to discharge, including tertiary filtration and UV disinfection. Additional alum is added prior to filtration to reduce the effluent phosphourus concentration of the discharge.

4.5.3 Option 3: Membrane Bioreactor (MBR)

Membrane bioreactor (MBR) systems provide treatment within a small footprint as it achieves activated sludge treatment, secondary clarification and tertiary filtration, in a single process step, thereby maximizing the hydraulic volume available for biological treatment. The MBR system's advantages over conventional technologies include a smaller footprint, ease of retrofit, operational flexibility, and the ability to produce a high-quality effluent.

Headworks processes, including screening and grit removal, are required prior to this biological treatment process. Fine screening (< 2mm) is generally required upstream of a MBR system. Sodium hydroxide is added to increase the alkalinity of the wastewater and alum is added to precipitate phosphorus. The MBR includes a mixed anoxic zone where denitrification takes place. From the anoxic zone, the wastewater overflows to the aerated membrane tank where biological treatment is achieved. The supernatant from the MBR process does not typically require any further filtration, due to the effluent quality achieved. The supernatant requires UV disinfection prior to discharge.

4.5.4 Option 4: Biological Nutrient Removal (BNR) Oxidation Ditch

Headworks processes, including screening and grit removal, are required prior to this biological treatment process. The oxidation ditch system is an activated sludge system and consists of an aeration tank and secondary clarifiers.

The ORBAL™ process is a variation of the oxidation ditch and uses a series of concentric channels within the same structure. The ORBAL™ aeration tank is configured as an oxidation ditch consisting of three concentric sections. Wastewater and return sludge enter the first section, which is anoxic, then pass through the middle and outer sections, which are aerated with rotating disk aerators mounted on shafts. The mixed liquor is then discharged from the outer section to the secondary clarifiers. Sodium hydroxide is added to increase the alkalinity of the wastewater and alum is added to precipitate phosphorus.

Two secondary clarifiers per ORBAL™ tank would be provided to separate the biological solids from the treated effluent. The biological solids settle to the bottom of the clarifiers and are pumped back to the oxidation ditch via sludge recirculation pumps. The supernatant liquid undergoes further treatment prior to discharge, including tertiary filtration and UV disinfection. Additional alum is added prior to tertiary filtration to reduce the effluent phosphourus concentration of the discharge.

4.6 Evaluation of Biological Treatment Options and Recommended Option

Table 17 is a comparative evaluation of Biological Treatment Options 1, 2, 3 and 4 for a mechanical treatment plant expansion and upgrade.

The four biological treatment options for the mechanical treatment plant provide reliable treatment and can handle variable contaminant loads. There are many municipal installations of these treatment systems in Canada, with the exception of the Membrane Bioreactor system that is gradually gaining more acceptance in wastewater treatment applications. Although the Biological Nutrient Removal Oxidation Ditch system (Option 4) has a higher relative capital cost than the Extended Aeration (Option 1), or SBR (Option 2), it offers the following advantages:

- simplest treatment system to operate and control
- lowest relative annual operating and maintenance cost.

Based on the evaluation of biological treatment options, Option 4, Biological Nutrient Removal Oxidation Ditch System, was identified as the preferred treatment option for the mechanical treatment plant upgrade.

4.7 Sludge Management Options

The four existing waste stabilization lagoons will be decommissioned as part of the Grand Bend STF Expansion and Upgrade. Sludge has accumulated at the base of the four lagoons since they became operational in 1980. Sludge has not been removed since this time.

The sludge in the existing lagoon cells must be removed and managed as part of a plant expansion and upgrade. Also, waste sludge generated in the future through biological treatment at the mechanical treatment plant must be managed onsite or offsite.

The following sludge management options were considered as part of the Grand Bend STF Expansion and Upgrade:

- Option 1: Land Filling of Sludge
- Option 2: Land Application of Sludge on Agricultural Land
- Option 3: Aerated Sludge Lagoon and Sludge Containment Wetland.

Table 17: Evaluation of Grand Bend STF Mechanical Treatment Plant Biological Treatment Options

Criteria	Option 1: Extended Aeration	Option 2: Sequencing Batch Reactor (SBR)	Option 3: Membrane Bioreactor (MBR)	Option 4: Biological Nutrient Removal (BNR) Oxidation Ditch
Description				
Biological Treatment Process Description	- biological treatment process, immediately following screening and grit removal - requires longer aeration time than other options - fine bubble aeration is typically used - higher BOD_5 removal efficiency than conventional activated sludge process	- a fill-and-draw type reactor system with a singe complete-mix reactor where all steps of the activated sludge process occur - operating cycles include fill, react/aeration, solids settling, and effluent withdrawal - at least 2 basins are used with one basin in fill mode, while the other goes through the react, solids settling, and effluent withdrawal stages - fine bubble aeration is typically used	- requires fine screening - small footprint achieves activated sludge treatment and tertiary filtration in one step, thus avoiding the need for separate aeration, secondary clarification and tertiary filtration steps - elevated biomass concentration effectively removes contaminants at higher loading rates - fine bubble aeration is typically used	- oxidation ditch consists of ring- or oval-shaped channels equipped with mechanical aeration and mixing devices - ORBAL™ process is a variation of oxidation ditch using a sequence of concentric channels within the same structure - disk aerators mounted on a horizontal shaft provide aeration
Service and Reliability				
Flexibility of Service	- flexible process - operates optimally at lower loading rates - can handle variable loads by adjusting operating parameters - a treatment train can be shut down during low flow conditions	- highly flexible process - can handle variable loads without impacting performance - a treatment train can be shut down during low flow conditions	- most flexible process in terms of handling variable loads with limited adjustment of operating parameters - a treatment train can be shut down during low flow conditions	- highly flexible process - can handle variable loads without impacting performance - sections of concentric channels can be shut down during low flow conditions
Reliability of Service	- provides reliable treatment - many installations in Canada	- provides reliable treatment - many installations in Canada	- provides reliable treatment - a major process limitation of early systems was membrane fouling (decrease in filtration performance over time, as soluble and particulate materials deposited on membrane) - process may need built-in redundancy to provide contingency - fewer installations in Canada than Options 1, 2 and 4	- provides reliable treatment - many installations in North America and Canada
Potential for Infrastructure Expansion in Phases	- additional tankage has to be provided to accommodate flows beyond 20+ years	- future loads can be accommodated in increments relatively easily by constructing at least 2 SBR basins at a time	- future loads can be accommodated in small increments more easily than other options	- additional tankage has to be provided to accommodate flows beyond 20+ years
Relative Ease of Construction, Operation and Maintenance	- treatment system, including aeration tank, can be constructed in modules - more complex system to operate than SBR and Oxidation Ditch (Orbal™) system - requires skilled operators to adjust parameters	- treatment system can be constructed in modules - requires skilled operators to monitor and adjust parameters	- treatment system can be constructed in modules - requires skilled operators to monitor and adjust parameters	- biological treatment system cannot be constructed in modules, due to large tank size of Oxidation Ditch. However, ultimate capacity can be phased in over 2 main phases - simplest system to operate and control
Sludge Management				
Sludge Management Requirements	- sludge management requirements are similar for Options 1, 2, and 4	- sludge management requirements are similar for Options 1, 2, and 4	- potentially more solids handling required due to fine screening - older sludge age in MBR reduces generation of waste activated sludge	- sludge management requirements are similar for Options 1, 2, and 4
Cost				
Relative Capital Costs (excluding sludge management costs)	- approximately \$19.4 M, excluding sludge management costs	- approximately \$18.9 M, excluding sludge management costs	- approximately \$22.8 M, excluding sludge management costs	- approximately \$21 M, excluding sludge management costs
Relative Operating and Maintenance Costs	- approximately \$517,000/year, excluding sludge management costs	- approximately \$595,000/year, excluding sludge management costs	- approximately \$692,000/year, excluding sludge management costs	- approximately \$500,000/year, excluding sludge management costs

4.7.1 Option 1: Land Filling of Sludge

Option 1 involves decommissioning the existing lagoon cells and draining them, allowing the sewage sludge to dry and removing it for transfer to a landfill. Waste sludge generated at the mechanical treatment plant would likely have to be thickened, stabilized and dewatered prior to transportation and disposal at a municipal landfill.

4.7.2 Option 2: Land Application of Sludge on Agricultural Land

This option would only be feasible if the stabilized waste sludge or "bisolids" has heavy metal concentrations no greater than the criteria outlined in the MOE's Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land (1996). Based on the lagoon sludge quality data obtained as part of the sludge sampling work completed by Golder Associates, the lagoon weighted average sludge data had heavy metal concentrations below MOE criteria. The Municipality must obtain approval to spread or apply the biosolids on agricultural land. The heavy metal content of the soil to receive the biosolids, and specific crop requirements must also be considered in relation to the 1996 MOE Guidelines.
Once the biosolids are judged suitable for land application, a specific site must be approved and receive a Certificate of Approval from the MOE for an "Organic Soil Conditioning Site", before the biosolids can be spread. The soil conditions, suitability of crops to receive sewage biosolids, application rates, required separation distances from sensitive land uses and watercourses, and the time of application must all be considered prior to land application.

Land application of biosolids is regulated under Ontario Regulation 347 of the *Environmental Protection Act* and Regulation 267/03 of the *Nutrient Management Act*. The Municipality, or the generator of the biosolids, must have a Nutrient Management Strategy and ensure that land-applied biosolids meet the Regulations. The hauler/applicator of the biosolids is responsible for ensuring the maximum application rate is not exceeded.

This option involves decommissioning and draining the existing lagoon cells, allowing the sludge to dry and removing the sewage sludge for transfer to an approved site. Waste sludge generated at the mechanical treatment plant would have to be thickened, and stabilized or digested prior to transportation and land application at an approved "Organic Soil Conditioning Site". MOE approved municipal anaerobic and aerobic digestion processes provide appropriate stabilization. Other stabilization methods would be reviewed by MOE on an individual basis.

4.7.3 Option 3: Aerated Sludge Lagoon and Sludge Containment Wetland

Option 3 involves decommissioning and draining the existing lagoon cells, allowing the sludge to dry and removing the sewage sludge. This would result in a sufficient volume of sludge that could be applied over the new wetland cells (former Lagoon Cells 1 and 2) to provide a good base material for wetland plant propagation. A diverse mix of wetland plants, such as cattail and bulrush will be planted, and shallow earthern berms and pools constructed to provide a mixed aquatic habitat. Water levels in the wetland will be maintained by diverting treated and disinfected effluent from the new mechanical treatment plant. Effluent from the wetland is diverted back to the mechanical treatment plant for treatment.

The waste sludge generated at the mechanical treatment plant would have to be stabilized prior to application in the sludge containment wetland. Aerobic digestion or stabilization of the sludge could be accomplished in an aerated sludge lagoon. The footprint of the recommended mechanical treatment plant only requires a portion of existing Lagoon Cell 4 (at Mollard Line). Existing Lagoon Cell 3, as well as a portion of Lagoon Cell 4, could be used for equalization storage, and as an aerated sludge lagoon. Alternatively, anaerobic digestion could be used for sludge stabilization in a closed digester tank. A co-generation system, including a reciprocating engine, could be used to generate heat and electricity. As part of the Sustainable Design Feasibility Study, the bioenergy alternative, including an anaerobic sludge digestion co-generation system was not considered financially viable based on an evaluation of capital costs, life cycle costs, and energy savings of various sustainable design alternatives. The stabilization of sludge through aerobic digestion is preferred for the Grand Bend STF Expansion and Upgrade.

4.8 Evaluation of Sludge Management Options and Recommended Option

Table 18 is a comparative evaluation of Sludge Management Options 1, 2, and 3 for the Grand Bend STF Expansion and Upgrade.

Table 18: Evaluation of Grand Bend STF Mechanical Treatment Plant Sludge Management Options

	Option 1: Land Filling	Option 2: Land Application	Option 3: Aerated Sludge Lagoon and Sludge Containment Wetland
Description			
Process Description – Lagoon Decommissioning	- existing sludge could be transported to a landfill, without requiring thickening, stabilization, or dewatering - backfill imported to cover lagoon cell clay liner and sufficient topsoil applied to allow former Lagoon Cell 1 and 2 to be re-naturalized to a field	- existing sludge could be transported to a landfill, without requiring thickening, stabilization, or dewatering - backfill imported to cover the lagoon cell clay liner and sufficient topsoil would be applied to allow former Lagoon Cell No. 1 and 2 to be re-naturalized to a field	- backfill imported to cover the lagoon cell clay liner and sufficient topsoil would be applied to support plant growth - Lagoon Cell No. 4 to be completely decommissioned - former Lagoon Cell 3 to remain a lagoon cell, with the addition of mixers to become an aerated sludge lagoon cell - former Lagoon Cells 1 and 2 to be rehabilitated with shallow earthen berms and pools to allow various operating water depths - sludge to be applied to wetland to provide a good base material for plant propagation
Process Description – Sludge Management for the Mechanical Treatment Plant	- sludge thickened, stabi®lized, and potentially dewatered onsite prior to transport, and disposal at a landfill	- sludge thickened, and stabilized onsite prior to transport, and land application at an approved site	- sludge stabilized onsite in an aerated lagoon and transferred to a sludge containment wetland for further treatment and storage
Service and Reliability			
Flexibility of Service	- provides flexible decommissioning of lagoons - re-naturalized land could potentially be reused - permitting and approvals may become more stringent with respect to offsite disposal of sludge - depends on availability of land for application	- provides flexible decommissioning of lagoons - re-naturalized land could potentially be reused - permitting and approvals could become more stringent with respect to offsite land application of biosolids/stabilized sludge - depends of availability of land	- provides flexible decommissioning of lagoons - no land on site available for reuse - wetland provides further treatment and storage of stabilized sludge

	Option 1: Land Filling	**Option 2: Land Application**	**Option 3: Aerated Sludge Lagoon and Sludge Containment Wetland**
Relative Ease of Construction, Operation and Maintenance	- relatively easy to decommission lagoons - transportation and landfill tipping fees	- relatively easy to decommission lagoons - transportation and associated fees for land application of biosolids/stabilized sludge	- relatively easy to decommission lagoons - wetland vegetation must be maintained - pumping station required to transfer wetland effluent back to treatment plant headworks
Land Use Compatibility			
Compatibility with adjacent/surrounding Existing & Planned Land Uses	- all three options are compatible with the adjacent/surrounding existing and planned land use - positive impact as land is re-naturalized	- all three options are compatible with the adjacent/surrounding existing and planned land use - positive impact as land is re-naturalized	- all three options are compatible with the adjacent/surrounding existing and planned land use - positive impact as wetland includes a diverse mix of wetland plants and provides a mixed aquatic habitat
Protection of Natural Environment			
Potential Loss/Adverse Impacts on Natural Environmental Features	- all three options have very low potential for disturbance of natural environment features	- all three options have very low potential for disturbance of natural environment features	- all three options have very low potential for disturbance of natural environment features
Cost			
Relative Capital Costs – Lagoon Decommissioning	$ 2.7 M	$ 2.0 M, excluding any storage	$ 1.6 M
20-year Life Cycle Cost – Including Lagoon Decommissioning and Ongoing Sludge Management	$ 10. 8 M	$ 7.6 M, excluding any storage	$ 2.0 M

Each sludge management option provides a flexible means of decommissioning the existing lagoons. Lagoon sludge quality data was obtained by Golder Associates as part of the sludge sampling work completed. The data indicated that the lagoon sludge could be applied to agricultural land, since it complied with the MOE's Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Lands. Permitting and approvals related to land filling (Option 1) or land application of sludge (Option 2) could potentially become more stringent in the future. The aerated sludge lagoon and sludge containment wetland (Option 3) offers the following advantages:

- available onsite land is used to accommodate the sludge management system
- does not require the transport of sludge off-site
- disposal costs, such as landfill tipping fees or agricultural land application fees, are avoided
- provides the lowest 20-year life cycle cost to manage the existing lagoon sludge and future waste sludge generated by the mechanical treatment plant.

Based on the evaluation of sludge management options, Option 3, Aerated Sludge Lagoon and Sludge Containment Wetland, was identified as the preferred option.

4.9 Septage Handling and Treatment

The Province of Ontario does not currently have a regulation requiring municipal wastewater treatment plants to provide septage handling and treatment. The Province does, however, encourage municipalities to ensure septage is properly managed within their jurisdiction.

The Provincial Policy Statement, issued under the *Planning Act* in 2005, includes several requirements for municipal sewage services. Municipalities may only allow the creation of new lots when sufficient sewage system reserve capacity is available. According to the Policy Statement, "the determination of sufficient reserve capacity shall include treatment capacity for hauled sewage from private communal sewage services and individual on-site sewage services" (septic systems).

Septage handling and treatment equipment is not proposed for the Grand Bend STF Expansion and Upgrade, due to the uncertainty associated with future septage needs in the Grand Bend area. Septage handling and treatment equipment could be added in the future to the proposed mechanical treatment plant, if warranted. Septage could be accepted during the winter months when the plant is anticipated to operate below its capacity.

4.10 Summary of Preferred Design

Figure 10 shows a layout of the preferred design for the expansion and upgrade of the Grand Bend STF. The preferred design includes:

- a mechanical treatment plant with the following process design components:
    - headworks, including screening and grit removal
    - biological nutrient removal oxidation ditch system and secondary clarifiers
    - chemically dosing systems, including sodium hydroxide and aluminium sulphate (alum)
    - tertiary filtration
    - ultraviolet disinfection
- aerated sludge lagoon and sludge containment wetland
- sustainable design concepts including solar photovoltaic system and an effluent heat recovery system.

5. PUBLIC AND AGENCY CONSULTATION

This section summarizes the public and agency consultation undertaken by Dillon during the Class EA process. Consultation was undertaken in accordance with the requirements of the "Municipal Class EA". All consultation materials are included in **Appendix C**.

5.1 Contact List

The Contact List for this project includes potentially interested/affected Federal agencies, First Nations, Provincial Ministries, municipalities, local agencies, interest groups, utilities and property owners within the future Service Area of the upgraded STF. The list also includes individuals who attended the July 15 and August 16, 2008 Public Information Centres.

5.2 Project Initiation Notice

A Project Initiation Notice appeared in the March 5 and 12, 2008 issues of the Lakeshore Advance and Forest Standard. Dillon mailed a copy of the notice to the Contact List on March 5, 2008, along with a comment form requesting comments by April 4.

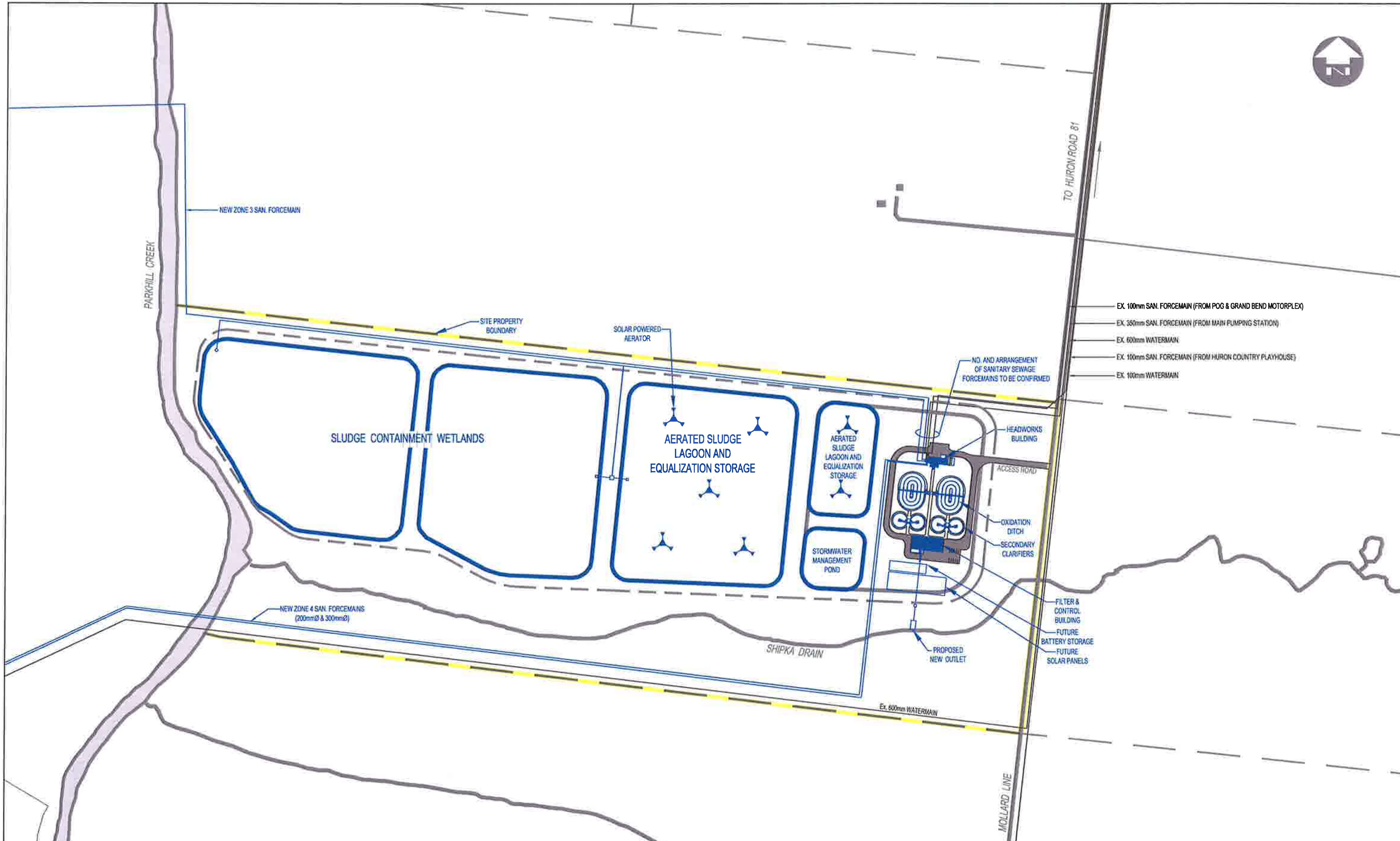
A total of 177 completed comment forms and letters were received, with most just requesting to be kept informed. Comments were received from the following:

Federal and Provincial Agencies

- Transport Canada (TC) stated that if any project related elements or activities cross or affect a potentially navigable waterway, Dillon must prepare and submit an application under the *Navigable Waters Protection Act* in accordance with the requirements of the Application Guide
- Supervisor of Environmental & Design Services, Ministry of Natural Resources, requested to be kept informed.

Municipalities & Local Agencies

- Community Health Services Department, County of Lambton
- Chief Administrative Officer, Municipality of South Huron
- Operations Manager – Water & Sewer, Municipality of South Huron
- County of Huron Planners for the Municipalities of South Huron and Bluewater



Grand Bend Sewage Treatment Facility Expansion and Upgrade
Class Environmental Assessment

FIGURE 10: PREFERRED SITE PLAN

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MUNICIPALITY OF BLUEWATER 2001

- County Engineer, County of Huron, stated that the project has no impact on the County highway system and, therefore, does not wish to be kept informed.

Utilities

- Lake Huron Primary Water Supply Systems requested to be kept informed on this project and any plans to service the Lake Huron Water Treatment Plant, north of Grand Bend
- Hay Communications Co-operative Limited requested to be kept informed and involved in all design and preliminary planning for the project. It also informed Dillon of a large fibre and distribution network within the Study Area.

Local Interest Groups, Ratepayers Associations & Developers

- Grand Bend Chamber of Commerce
- McIlwraith Field Naturalists
- Rice Development Company Incorporated
- Southcott Pines Park Association
- Klondyke Trailer Park is concerned about the cost of hook-ups since this may negatively affect business
- Lambton Area Builders Exchange requested to be considered during the project tender stage
- Country Side Group Investments requested that future correspondence be sent to property owners
- Grand Bend Women's Institute does not wish to be kept informed.

Residents

One hundred fifty-eight residents replied to the notice, with most requesting to be kept informed. Forty-two included comments, questions and concerns mostly pertaining to the timing and cost of the project. Additional comments, questions, and concerns included:

- Ten residents approve of the project, primarily due to its environmental benefits, and would like to see it move forward quickly
- Five residents disapprove of the project, due to the cost of individual hook-up and municipal costs
- One resident asked about approvals for new septic systems in the Study Area while the extension of municipal services is debated

- One resident asked for a copy of the Grand Bend and Area Sanitary Sewage Master Plan
- One resident who recently moved close to the STF asked if there will be any noticeable odours originating from the plant
- One resident expressed concern about the impacts of the project on storm sewers and drainage.

5.3 Receiver Background Review Meeting with Ministry of the Environment

A meeting was held with Western Region MOE staff at the Ministry's office on March 19, 2008 to establish effluent quality criteria for an expansion and upgrade of the Grand Bend STF.

Dillon provided a Receiver Background Review Memorandum dated March 17, 2008 to MOE staff in advance of this meeting. The Memorandum provided an overview of background information on Parkhill Creek, including water quality, flow conditions, the fish community, species at risk, and the benthic community. At the meeting, MOE staff indicated that Dillon's background review of the receiver was sufficient and no additional field work will be required. Dillon also outlined the proposed effluent quality concentration objectives and limits at the meeting, as included in the Memorandum. MOE staff was satisfied with the effluent quality criteria presented at the meeting. Minutes from the meeting are included in **Appendix C.**

5.4 Public Information Centres

Public Information Centres (PICs) were held on July 15, 2008 from 4:00 to 8:00 p.m. at the Grand Bend Public School, and on August 16 from 10:00 a.m. to 1:00 p.m. at the Dashwood Memorial Community Centre. The purpose of both PICs was to obtain public and agency input on the design options developed for the STF expansion and upgrade. A mechanical sewage treatment plant was presented as the recommended design option.

5.4.1 Distribution of PIC Notice

A notice advertising both the Grand Bend and Dashwood PICs appeared in the July 2 and July 9, 2008 editions of the Exeter Times Advocate, Clinton News-Record, Lakeshore Advance and Forest Standard. Dillon mailed a copy of the notice to the project Contact List on July 2, 2008. A second notice was published in advance of the Dashwood PIC in the August 13, 2008 edition of the Exeter Times Advocate, Clinton News-Record, Lakeshore Advance and Forest Standard. The notice also appeared in the July 30 and August 5 editions of the Clinton News-Record.

A digital copy of the PIC notice was available on the Lambton Shores, South Huron and Bluewater Municipal websites.

5.4.2 Presentation and Attendance

The PIC was an informal session with displays summarizing the work completed on the project to date. A copy of the displays and comment form requesting comments by September 2, 2008 were handed out to all in attendance.

The displays summarized:

- Grand Bend & Area Sanitary Sewage Master Plan (2006)
- Municipal Class Environmental Assessment (EA) Planning and Design Process
- public/agency replies to the Project Initiation Notice (April 2008)
- design criteria, including projected population and sewage flows and effluent criteria
- treatment process components
- sustainable design concepts
- comparative evaluation of alternatives, including:
    - Alternative 1 – lagoon upgrade, New Hamburg process
    - Alternative 2 – lagoon upgrade, wetland/natural treatment
    - Alternative 3 – mechanical treatment plant upgrade (recommended)
- sludge management and treatment options and the preferred approach
- capital and operating costs estimates
- Service Area, phasing & timing of the project
- remaining steps in the Class EA process.

The Grand Bend PIC was attended by approximately 65 people, including members of the public and local agency representatives. Approximately 30 people were in attendance at the Dashwood PIC, including members of the public and local media.

5.4.3 Informal Discussions

Overall, the response to the project was positive and most residents, including Bluewater residents, appeared to accept the need to expand and upgrade the STF and agreed with the recommended alternative of upgrading the STF to a Mechanical Treatment Plant. Many residents were pleased to see that sustainable design concepts are being integrated into the project. Bluewater residents indicated that some subdivisions are experiencing septic system failures and asked about the timing of construction of the collection system in Bluewater.

Most questions pertained to the timing of construction, individual household costs and municipal costs. Several concerns were expressed by those in attendance, including:

- one resident felt that the project was not justified and the current septic systems are sufficient
- some residents felt that septage capacity should be included in the expansion and upgrade of the Grand Bend STF
- the owner of the property adjacent to the STF is concerned about odour control. In the past, there have been few problems with odour from the lagoons, but the resident is worried about the potential for increased odour with the proposed increase in STF capacity
- one resident stated that the developer of Southbend Estates should be responsible for the majority of the costs to expand and upgrade the STF. The resident also asked about the availability of Federal and/or Provincial grants
- one resident of Oakwood Park in South Huron is concerned that construction of a collection system in her area could block access to her home. Dillon advised that these concerns will be addressed in the future Class EA of the South Huron collection system.

5.4.4 Written Submissions

By letter dated July 22, 2008, Dillon mailed a copy of the PIC displays to the agencies included on the Contact List, along with a comment form requesting comments by September 2. A copy of the PIC presentation material was also available on the Lambton Shores municipal website. Approximately 25 written submissions were received:

Provincial Agencies

- Ministry of Municipal Affairs and Housing recommended that the Provincial Policy Statement (PPS) be considered in the ESR. Additional recommendations included ensuring that local Official Plan policies are integrated into the preferred design recommendation.

- Pertaining to the Pinery Provincial Park Sanitary Sewage Collection System, MNR asked that the Municipality confirm the validity of the previous cost sharing formula and provide an updated accounting of potential MNR costs based on recent construction estimates.
- Ministry of Transportation (MTO) asked about potential impacts on Provincial Highway 21. Dillon explained that Highway 21 will not be impacted by the expansion and upgrade of the Grand Bend STF. The collection systems for Pinery Park and Zone 4, both in the Detailed Design stage, are being designed to avoid the Highway 21 right-of-way (ROW).

Utilities

- Lake Huron Primary Water Supply System indicated that a draft Intake Protection Zone (IPZ) has been delineated for the Lake Huron Water Treatment Plant at 71155 Bluewater Highway. IPZ-2, as delineated in draft, currently extends into the Grand Bend area and may have future implications for land use planning, as well as various point and non-point sources of potential contamination, including septic systems. Once finalized, the protection zone designation will become part of a Source Protection Plan for the plant, as required under the *Clean Water Act.*

Interest Groups, Ratepayers Associations, Developers and Trailer Parks

- Bluewater Shoreline Residents Association supports the project, as well as the servicing of the Bluewater shoreline
- Maple Grove Syndicate Limited indicated that it owns approximately 45 acres of lakefront land with 12 cottages immediately north of Oakwood Park in South Huron. It requested information about the Dashwood PIC and asked for an online source of further information on the project
- Pinery Antique Flea Market asked about the timing and cost of the project, as it affects the market
- Rice Development indicated that it owns approximately 50 acres of land on the north side of Huron Road 81, currently zoned for mixed residential and commercial development. As part of the subdivision process, Council allocated 120 m^3 of sewage capacity to the proposed development for a two year period, ending in September 2008. Rice Development supports the expansion and upgrade of the Grand Bend STF and agrees that Alternative 3 is the preferred option, but expressed concern that the cost of the project will result in development charge increases.

- Tru Land Developments indicated that it owns approximately 42 acres of land on the south side of Huron Road 81, in the Municipality of Lambton Shores, and approximately 52 acres west of Mollard Line, in the Municipality of South Huron. The developer authorized Sharen Realty to attend the PIC on July 15 to request that these lands be included in the Service Area for the project.

Local Residents

- Several residents support the project.
- One resident requested that odour be reduced as much as possible.
- Another resident asked about the timing of construction of the collection systems in Bluewater and South Huron.
- One resident requested a digital copy of the PIC boards and later provided general suggestions about the content of the presentation. This resident also asked about the timing of construction of the upgrade and future collection systems.
- One resident feels that the STF should have septage handling capacity.
- One resident is opposed to the servicing of Dashwood.
- One resident asked about the ability of the upgraded STF to extract heavy metals and metallic compounds dissolved and/or mechanically suspended in the raw sewage. Also, has Dillon considered the option of treating the solids and sludge for safe use as nursery soil, potting soil and solid fertilizer for farmland?
- Two residents asked about project costs, including the estimated costs for the lagoon upgrade alternatives (Alternatives 1 and 2).
- Another resident requested a copy of the Grand Bend and Area Sanitary Sewage Master Plan (February 2006).
- The property owners adjacent to the existing STF site support Alternative 3, but believe that the Municipality should first look at increasing water rates and encouraging the use of low flush toilets to discourage wasteful water usage, potentially eliminating the need for a plant expansion. If a new Mechanical Treatment Plant is selected as the preferred alternative, the owners requested that the existing buffer zone, as currently applied to their property (Lot 5), be removed and will seek compensation for being located in a buffer zone. They are also opposed to the lagoon upgrade alternatives that involve the purchase of their property on Lot 5.

In addition to these comments, four residents submitted questions and concerns pertaining to the proposed South Grand Bend 'Zone 3' Sanitary Sewage Collection System project. These comments were addressed at the PIC held on September 30, 2008 for the Zone 3 project.

5.4.5 Media Coverage

Newspaper articles appeared in the Lakeshore Advance, following both the Grand Bend and Dashwood PICs. In total, three articles were published, including:

- "Year end deadline for phase one" by Linda Hillman-Rapley on July 24, 2008.
- "Sewers will become reality" by Linda Hillman-Rapley on July 24, 2008 (editorial).
- "Sewer project on target: looking towards the future" by Jordan Barker on August 21, 2008.

These articles are included in **Appendix C**.

5.5 Notice of Completion

This ESR will be placed on the "public record" for the required 30-day public and agency review period. During the review period, the Class EA entitles any person who has significant concerns, which cannot be resolved, to request the Minister of Environment to change the status of the project from a Class EA to an individual EA by issuing a Part II Order under the *EA Act*.

If there are no Part II Order requests, and following the receipt of other required approvals, the proposed STF expansion and upgrade may proceed to construction.

6. PROJECT DESCRIPTION

Section 6 describes the selected design of the proposed STF expansion and upgrade, including its benefits, potential impacts and the environmental protection and mitigating measures which must be implemented during Phase 5 of the Class EA process. Phase 5, which has yet to be completed, consists of the Detailed Design and construction of the STF.

6.1 Selected Design

The selected design meets existing and future servicing needs in a timely and cost-effective manner, is environmentally sound and allows future growth in the Study Area.

Lagoon Cell 4 (which is closest to Mollard Line) will be taken off line and a mechanical treatment plant will be built in its place. Lagoon Cell 3 will be kept as an open surface system and upgraded to include mixers so that it acts as an aerated sludge lagoon. Lagoon Cells 1 and 2 (nearest to Parkhill Creek) will be converted to a sludge containment wetland.

The selected design for the Grand Bend STF Expansion and Upgrade includes:

- a mechanical treatment plant, including the following process design components:
    - headworks, including screening, grit removal, and a biofilter to control odour emissions
    - biological nutrient removal oxidation ditch system and secondary clarifiers
    - chemically dosing systems, including sodium hydroxide, aluminium sulphate (alum), and polymer
    - tertiary filtration
    - ultraviolet disinfection
- effluent heat recovery system
- aerated sludge lagoons and sludge containment wetlands.

Energy efficient process design equipment, to be included as part of the upgrade, will include: dissolved oxygen control to reduce the output of aerators, variable speed sludge return pumping to allow pumps to operate at a lower speed and output when flows are low, and flow pace features for the UV system to reduce the number of lamps in service.

The following sustainable design considerations were included as part of the Preliminary Design of the Grand Bend STF Expansion and Upgrade:

- solar walls for the south-facing walls, and a "green" roof for each onsite building
- an effluent heat recovery system
- solar powered mixers for the aerated sludge lagoons (Solarbee mixers)
- use of building products that incorporate recycled content materials, such as the use hydraulic slag to reduce the Portland cement content in concrete
- use of building materials that are fabricated within a 800 km radius and use of durable design materials with a lengthy design life
- use of high efficiency interior fixtures and exterior fixtures with photocell and time of day controls
- occupancy sensors for unit sensors interior lighting.

A solar photovoltaic system was also recommended for the Grand Bend STF Expansion and upgrade.

The full build-out of the Grand Bend STF Expansion and Upgrade to a Mechanical Treatment Plant can be completed in phases, depending on the servicing needs of the Study Area and the availability of funding.

The selected design for the Grand Bend STF Expansion and Upgrade is documented in Dillon's Draft Pre Design Report, dated January, 2009.

6.2 Plant Operation

An operating agreement is being prepared for the upgraded Grand Bend STF. Ownership of the infrastructure will be shared among the three municipalities. The Municipality of Lambton Shores, which requires the largest portion of wastewater capacity at the upgraded Grand Bend STF, will continue to act as the "Operating Authority", or the administering municipality, and have responsibility for the operation and maintenance of the facility.

6.3 Capital and Operating Costs

Financing of the Grand Bend STF expansion and upgrade will be considered on a full cost recovery basis to ensure that user rates include ongoing operation and maintenance costs associated with the upgraded STF. This will support the long-term sustainability of wastewater infrastructure. **Table 19** provides Dillon's opinions of probable capital costs for the Grand Bend STF Expansion and Upgrade, in 2009 dollars.

Table 19: Opinion of Probable Capital Costs

Centre	Cost Estimate
Mechanical Treatment Plant	$ 16,139,500
Development of sludge containment wetlands (including removal of existing lagoon sludge)	$ 605,000
Subtotal (Direct Costs)	**$ 16,744,500**
Indirect costs including contractor mobilization and demobilization (3%), insurance and bonds (3.5%), start-up and trial operation (1%)	$ 1,260,000
Contingency (20%)	$ 3,350,000
Engineering (15%)	$ 2,510,000
TOTAL	**$ 23.86 M (excl. taxes)**

These costs are an opinion of probable costs based on preliminary-level cost estimates. The project costs will be further refined upon the completion of the detailed design.

The three municipalities pursued various funding opportunities for the Grand Bend STF Expansion and Upgrade project to lessen the burden of project costs for the residents of Grand Bend and surrounding area. The following funds have been approved for the project:

- Building Canada Fund – Communities Component: investment of two-thirds of project capital cost of approximately $14.9 M, with $7.45 M provided through provincial government and $7.45 M provided through federal government. (Approved February 13, 2009)
- Federation of Canadian Municipalities Green Municipal Fund: $2 M loan in combination with a grant of $400,000. (Approved February 23, 2009)

The participating municipalities are each financially responsible for their portion of capital costs for the project, based on their respective ultimate wastewater flow contributions to the upgraded STF, as provided in Section 3.3, **Table 5**. The proposed capital cost contribution for each municipality is provided in **Table 20**.

Table 20: Municipal Capital Cost Contribution

Centre	Cost Estimate
Municipality of Lambton Shores (43% for Lambton Shores and 5.4% for Pinery)	$ 11.55 M
Municipality of South Huron (30.2 %)	$ 7.20 M
Municipality of Bluewater (21.4 %)	$ 5.11 M
TOTAL	**$23.86 M**

The annual operating and maintenance costs for the full build-out of the expanded and upgraded Grand Bend STF is provided in **Table 21**. This cost includes annual chemical consumption, labour, and utility costs, such as electricity.

Table 21: Annual Operating and Maintenance Costs (2009 dollars)

Component	Cost
Estimated cost (no solar PV system)	$ 500,000/year
Estimated cost with a 200 kW solar PV system	$ 436,000/year

An opinion of probable cost per homeowner in the Study Area for the Grand Bend STF Expansion and Upgrade is provided in **Table 22**. These costs are based on an estimated total of more than 4,600 households in the Study Area by 2031. Household or homeowner costs exclude the costs associated with the new sanitary collection system, any grants or funds that may be provided, or any existing municipal reserves. The three municipalities will determine the method of cost recovery for the project.

Table 22: Opinion of Probable Costs for Homeowners

Centre	Cost per household
Capital Costs	$ 5,100 /household
Operating and Maintenance Cost	$ 100/household

6.4 Benefits, Impacts and Mitigating Measures

The Grand Bend STF Expansion and Upgrade is anticipated to provide the following benefits:

- An improvement in the level of treatment of the wastewater effluent.
- An increased number of households can be connected/serviced by municipal sewage services as a result of the STF expansion and upgrade.
- A more reliable form of wastewater treatment that can accommodate variable flows and loads will be achieved through the expansion and upgrade of the Grand Bend STF to a mechanical treatment plant.
- A reduced annual effluent loading of Total Phosphorus to the receiver Shipka Drain/Parkhill Creek/Lake Huron.
- An improvement in the water quality of affected subwatersheds is anticipated as private septic systems are decommissioned.
- Environmental benefits associated with the sustainable design concepts to be incorporated as part of the project including an energy efficient process design, the use of on-site renewable energy sources, and an innovative approach to sludge management.

An assessment of the benefits and impacts of the proposed STF expansion and upgrade is provided in **Table 23**.

Table 23: Benefits, Impacts and Mitigating Measures

Environmental Feature	Benefits, Impacts and Mitigation
1. Wastewater/Civil Engineering	
Long-term Servicing of Study Area	Provides a long-term, environmentally sustainable sanitary sewage servicing solution for existing and future development in the entire Lambton Shores, South Huron and Bluewater Study Area
Ability to Phase STF Expansion and Upgrade	Modular plant design allows treatment capacity to be increased in phases, if necessary
Utility Extensions	Requires extension of Ontario Hydro electric power to site Requires a water connection Requires telephone and potentially cable service to site
2. Cultural Resources	
Lands with Archaeological Potential	Potential destruction of cultural resources avoided by completion of Stage 2 assessment of lands with archaeological potential. Archaeological clearance required prior to construction
Deeply buried archaeological material	Potential destruction avoided by construction contract provisions requiring immediate contact with MCL. The *Ontario Cemeteries Act* applies to the discovery of human remains
3. Fisheries and Aquatic Habitat	
Shipka Drain: - water quality - flow/stream morphology	STF's effluent criteria will lessen water quality degradation New or modified outfall; best practices to be used for new outfall or outfall modification to Shipka Drain (e.g., sediment and erosion control, scour protection) Work associated with the new or modified outfall to be undertaken during dry conditions in Shipka Drain (July or August) Constant discharge from plant would add more continuous flow to this currently intermittent drain. Although ABCA considers Shipka Drain a Class F drain, the Municipality of South Huron indicated that the municipal drain ends approximately 1 km upstream of Mollard Line

Parkhill Creek (formerly Ausable River) - water quality - flow/stream morphology - Species at Risk	STF's effluent criteria will lessen water quality degradation and provide increased protection of habitat for the watercourse's warmwater sport and bait fishery Constant discharge from the upgraded plant will add more continuous flow to Parkhill Creek during base flow conditions River Redhorse (Species at Risk) is known to occur in Parkhill Creek, but has not been documented in the vicinity of STF. If present, the upgraded STF will not conflict with ABCA Recovery Strategy since: - effluent criteria will lessen water quality degradation - no anticipated water temperature impacts to the warmwater system
4. Terrestrial Resources	
Vegetation	Expansion and upgrade will likely require removal of: - pasture mix vegetation on outside slopes of lagoons - scattered red ash, sandbar willow, autumn olive and white elm in Lagoons 1 and 2 - scattered hedgerow of planted white cedar along northern boundary of lagoons. Loss of vegetation mitigated by riparian plantings around lagoons to provide tertiary treatment of effluent. Also, a site Landscaping Plan will be prepared during Detailed Design
Migratory and Protected Birds	Existing site provides habitat for a large number of various species of migratory and resident waterfowl. However, site is not considered to be a "natural environment" since raw municipal wastewater has adverse impacts on birds and other wildlife. The sludge containment wetlands include habitat features and have been found to provide a natural environment for various bird species
Wildlife	Wildlife activity is high on existing site. Expansion and upgrade may reduce wildlife activity. However, site is not considered to be a "natural environment" since raw municipal wastewater has adverse impacts on wildlife. Site may be fenced to restrict access to mammals and avoid adverse impacts

5. Existing and Future Land Uses	
Existing Residential Uses (defined as "sensitive land uses" in MOE Guideline D-2, "Compatibility between Sewage Treatment and Sensitive Land Use")	Noise, odour and aesthetic impacts on two existing farmhouses north and south of site on Mollard Line minimized by: - distance between closest noise/odour producing source and farmhouses (approx. 265 metres to farmhouse to north, approx. 350 metres to farmhouse to south) - noise impacts minimized by enclosing equipment with motors inside buildings - odour impacts minimized through proper operating practices, including a biofilter unit to control odour emissions - aesthetic impacts minimized by a Landscape Plan (to be prepared during Detailed Design) and enclosing plant in an architecturally designed building
Future Residential Uses	No lands are designated for future residential development in the local municipal Official Plans within 150 metres of plant's closest noise/odour producing source
Conformity to Municipality of South Huron Official Plan	Conforms to Official Plan: - infrastructure and utilities, such as sewage treatment plants, are permitted in "Agriculture" areas - based on the ABCA' s regulatory flood elevation of 181.0 m, any proposed buildings at the site should be constructed above this elevation
Compliance with South Huron Zoning By-law	Complies with zoning: - "Disposal (DS) Zone" permits sewage treatment works, subject to applicable MOE regulations - new sludge containment wetland partially located within Klondyke Special Policy Area (SP1) Zone. All other improvements are located outside this area - buildings should be above 180.7 metre common Regional
Conformity to Lambton Shores Official Plan	Conforms. Expanded site is not located within 100 metres of an existing residential or sensitive land use in Lambton Shores
6. Provincial Guidelines and Policies	
Compliance with 150 metre Separation Distance recommended by MOE Guideline D-2,	Complies with recommended 150 metre separation distance for residential uses, but not for other "sensitive land uses":

"Compatibility between Sewage Treatment and Sensitive Land Use")	- cash crops fields adjoin the northern lot line of the site - "cattle raising" (a pasture) adjoins the southern lot line of the site. Lambton Shores will apply to the Municipality of South Huron to add a buffer area around the site to South Huron's Official Plan and Zoning By-law, as recommended by MOE Guideline D-2
Consistency with Provincial Policy Statement (PPS)	Expansion and upgrade is consistent with PPS: - the impacts associated with private water systems on water resources will be reduced, allowing for future development and growth to proceed in a sustainable manner - is financially viable and complies with all regulatory requirements - protects human health and the environment through an improved level of wastewater treatment - integrated servicing and land use considerations in all stages of the planning process
7. Costs	
Capital Cost	Capital costs to future homeowners in the Study Area will form part of the development levy. Various funding applications have been submitted for this project to reduce the cost to homeowners.
Operating and Maintenance Cost	Operating and maintenance costs have been minimized through the proposed sustainable design concepts which reduce energy demand

6.5 Project Schedule

The proposed project schedule is:

- Preparation of Detailed Design Drawings and Contract Documents for the construction of Phase 1 of the expansion and upgrade. The drawings and documents will incorporate the environmental provisions and mitigating measures identified in this ESR to avoid/mitigate any negative impacts. This stage is tentatively planned for April – November of 2009.
- The receipt of all necessary design and construction related approvals, including a Sewage Works - Certificate of Approval from MOE. Other design related approvals are outlined in Section 6.6.
- Tendering of the project and construction. Construction is tentatively scheduled for 2010.

6.6 Approvals

The following approvals are required prior to construction:

- "Sewage Works" Certificate of Approval – from MOE for the expanded and upgraded treatment facility (required under Section 53 of the Ontario Water Resources Act).
- "Air and Noise" Certificate of Approval – from MOE, in particular for the standby diesel generator associated with the expanded and upgraded treatment facility (required under Section 9 the Environmental Protection Act).
- Archaeological clearance from the Ministry of Culture.
- Minor Works Permit Permission from Ausable Bayfield Conservation Authority regarding impacts to watercourses of plant construction and new or modified outfall
- Building Permits and Site Plan Approvals – Municipality of South Huron and the County of Huron.
- Site approval for electrical design from the Electrical Safety Authority or Hydro One.
- Permission from Ontario Ministry of Natural Resources prior to stocking wetlands with minnows.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

Louis Tasfi, Ph.D., P.Eng
Project Manager

Janet Smolders, MCIP
Project Planner

APPENDIX A
SCREENING OF ON-SITE TERTIARY TREATMENT SYSTEMS

Screening of On-Site Tertiary Treatment Systems

Table C-1 EcoFlo	
Factors	**Treatment Specifications**
EcoFlo Treatment System	
Design Criteria	• Model ST-500 or STB-500 (1and 2 bedroom): 1 500 L/d (peak daily design flow rate) • Model ST-650 or STB-650 (3 and 4 bedroom): 2 200 L/d (peak daily design flow rate) • Note: There are two configurations, ST having an open bottom and STB with a submersible collecting bottom
Treatment Capacity (L/d)	For residential units capacity ranges up to 2 200 L/d
Treatment Performance for Nitrate (mg/L)	• 50-60% Nitrate reduction in cold weather 60-75% reduction in warm weather with recirculation (based on performance letter) • < 50% with no recirculation
Treatment Performance for BOD, TSS and TP (mg/L)	• BOD: <10 mg/L, 95% removal (approx. 2 mg/L) • TSS: < 10 mg/L, 90% removal (approx. 2 mg/L) • TP: no removal • Fecal coliforms: < 25 000/100 mL, 99% removal (approx. 1250 mg /100 mL)
System Reliability	• Provided excessive flows don't occur, excessive chemicals not dumped down the drain, etc. (according to manufacturer)
Potential for Odour Formation	• Potential odour issue if vent stack not properly connected to house/septic tank or improper installation causing unit malfunction • If odour detected, EcoFlo installs a carbon filter until cause is determined • Remediation is easy in 99% of cases
Maintenance Requirement	• Requires cleaning effluent filter, raking peat • All maintenance done by a trained technician certified by the manufacturer (Premier Tech Environmental) • No maintenance required by owner
Frequency for Media Replacement	Once approximately every 8 years peat must be replaced
Monitoring Requirement	**Area Bed:** Conduct sampling and testing in accordance with the requirements of the Ontario Building Code (OBC): • once during first 12 months • thereafter every 48-month period **Shallow Buried Trench:** • Once during first 12 months, thereafter once every 12 months (and between 10 to 18 months of previous sampling event)
Order of Magnitude Capital Cost	$12 000-$17 000 Installed depending on pre-existing conditions (included: septic tank and 2-year annual maintenance contract which has a value of $260)

Table C-1 EcoFlo	
Factors	**Treatment Specifications**
Order of Magnitude Operating Costs	• If no pump, $0 for first 2 years (incl. in capital cost above) except for regular pumping costs associated with cleaning out septic tank • If pump is installed the cost of operating a 0.3 kW effluent pump must be considered • Annual maintenance contract of $130 per yr for single system varies for multiple systems (peat change-out extra)
Acceptance by MOE and Heath Units	• Ontario Building Code Approval of EcoFlo Biofiltration Treatment Unit for meeting secondary effluent quality criteria (based on MOE letter dated Feb. 9, 1998) • Building Material Evaluation Commission (BMEC) Approval of EcoFlo ST-650 Biofilter System for tertiary level treatment- April, 1999 • MOE acceptance based on approved C of A's • Health Unit acceptance based on Building Materials Evaluation Commission (BMEC) approval
Number of Installations and Service Life	• Ontario: close to 5,000 as of 2006 • Started in 1988 in Ontario, first installed in 1994 • Service life is approximately 8 years; replace peat, and it will be good for another 8 years, etc. • 10 year warranty on system • Total Lifespan approx. 30 years
EcoFlo Sub-surface Discharge	
Type Sub-surface Discharge System based on Soil Type	**Sand:** • shallow buried trench for percolation times (T) of 125 min/cm or less **Clay:** • to avoid a mound, put bottom on EcoFlo and pipe to an absorption system below grade (EcoFlo no longer on top of absorption system) • shallow buried trench for percolation times (T) of 125 min/cm or less • raised absorption system

Table C-1 EcoFlo	
Factors	**Treatment Specifications**
Design Criteria for Sub-surface System (based on Part 8 of OBC)	**Absorption System:** • Stone layer of 200 mm (minimum) over 250 mm (minimum) of sand (with percolation time of 6-10 min/cm) • Provided that the underlying native soil has a percolation time of less than 6 min/cm, the water table shall be a minimum of 600 mm below the bottom of the stone layer required **Stone Layer** • $Q \leq 3\ 000$ L/d: the loading on the surface of the stone layer should not exceed 75L/m^2 per day • $Q > 3\ 000$ L/d: the loading on the surface of the stone layer should not exceed 50 L/m^2 per day • minimum area of crushed stone is 27 m^2 **Sand Layer** • The sand layer shall have a minimum area that is the greater of: the area of the stone layer required, and • A = QT/850 where, A = the area of contact, m^2 Q = the total daily design flow, L and, T = the lesser of 50 and the percolation time of the underlying soil, min/cm • In a raised absorption system, the sand layer shall extend at least 15 m beyond the perimeter of the system, in any direction which the effluent entering the soil will move horizontally **Shallow Buried Trench:** • Length of distribution pipe (L) shall not be less than 30 m when constructed as a shallow buried trench
Bed Size based on soil type (analysis utilized hydraulic loading rate and Q = 2500L/d)	1 min/cm < T ≤ 20 min/cm, Area = 250 m^2 20 min/cm < T ≤ 35 min/cm, Area = 313 m^2 35 min/cm < T ≤ 50 min/cm, Area = 417 m^2 T > 50 min/cm, Area = 625 m^2
Minimum Lot Area required for Treatment System per Soil Category (sum of disposal system and treatment unit area)	1 min/cm < T ≤ 20 min/cm, Area = 275 m^2 20 min/cm < T ≤ 35 min/cm, Area = 338 m^2 35 min/cm < T ≤ 50 min/cm, Area = 442 m^2 T > 50 min/cm, Area = 650 m^2
Does the system meet MOE reasonable use policy requirements?	• Yes, if a solution is devised to treat nitrates (recycle, etc.) • Yes, if based on travel through absorption bed
Life Expectancy of Sub-surface System	• Indefinite, if system working effectively to reduce nutrients • Only treated water is discharged so life expectancy is "indefinite"
Acceptance of Sub-surface System by MOE and Health Unit	• MOE developed sizing calculations • Health Unit relies on MOE/Building Code evaluation
Maximum Observed Life of Sub-surface system	First installed system in 1994
Potential for Treatment System	• An EcoFlo could malfunction due to misuse by owner

Table C-1 EcoFlo	
Factors	**Treatment Specifications**
Failure	• Moving parts limited to tray and pumps, therefore cause for failure is easily identified and can be easily fixed
Remedial Step to Correct Equipment Failure	• Pump out peat and replace • If system was installed incorrectly, dig up and replace
Overall Impact of Equipment Failure on System Performance	If equipment fails, system performance will likely halt until equipment is remediated
Potential for Sub-surface System failure	• Provided system is working properly, sub-surface system should last indefinitely • If owner misuses systems (dumping chemicals down drain, etc.), sub-surface system could temporarily fail or in the worst case permanently fail
Remedial step to correct system failure without contingency for sub-surface system replacement	• Attempt to remediate by fixing source of problem • Dig up area bed and replace with new media
Remedial step to correct system failure with contingency for sub-surface system replacement	• Attempt to remediate by fixing source of problem • Dig up area bed and replace with new media • Add new area bed or new shallow pressure trench and divert flow to this system. May have to install bottom on system to allow for diversion of flow if system was previously sitting on top of the area bed

Table C-2: Waterloo Biofilter	
Factors	**Treatment Specifications**
Waterloo Biofilter Treatment System	
Design criteria	Model # 11 - 1100 L/d (2 bedroom) system Model # 16 - 1600 L/d (3 bedroom) system Typical domestic wastewater: • 500 L/m^2/day or 50 cm/day for a 0.9 m deep bed • Treatment improves if 50-66% of the effluent is re-circulated to the septic system (must account for this additional flow in the design) • For residential sewage maximum loading rate of 750 L daily design flow per m^3 of biofilter medium (specified by OBC)
Treatment Capacity (L/d)	For residential units capacity ranges from 1 100 to 10 000 L/d
Treatment Performance for Nitrate (mg/L)	• 20 – 40% TN removal single pass • 50 – 65% TN removal with recirculation • Nitrate: < 5 mg/L
Treatment Performance for BOD, TSS and TP (mg/L)	• BOD < 10 mg/L, 90 -99 % removal • TSS < 10 mg/L, 90 -99 % removal • Fecal coliforms: < 25 000/100mL, 99% removal • TP: no removal but an upflow chemical filter can be added as a module to remove P
System Reliability	System is reliable, provided: • owner should not use excessive disinfectant, bleach or fats during cooking • nozzles can become plugged
Potential for Odour Formation	• Optional ventilation system • Passive air vents through enclosure • Activated carbon filter can be used • Odour control necessary, if septic tank is unhealthy • Odour problems can occur if water supply is from black shale or limestone containing iron sulphide
Maintenance Requirement	• Persons authorized by manufacturer are required to service and maintain Biofilter • Annual maintenance • Owner not permitted to maintain Biofilter
Frequency for Media Replacement	• May need to replace • In 2009, expected warranty on foam bed of 20 yrs • If used correctly should only have to replace foam bed once every 20 yrs • May need minimal replacement of foam on a year to year basis depending on flows

Table C-2: Waterloo Biofilter	
Factors	**Treatment Specifications**
Monitoring Requirement	**Area Bed:** Conduct sampling and testing in accordance with the requirements of the OBC: • once during first 12 months • thereafter every 48-month period **Shallow Buried Trench:** • Once during first 12 months, thereafter once every 12 months (and between 10 to 18 months of previous sampling event)
Order of Magnitude Capital Cost	• 1 100 L/d (2 bedroom) and 1 600 L/d (3 bedroom) systems typically cost from $14 000 to $16 000 fully installed • this capital cost estimate incl. the septic tank, effluent filter, Biofilter, pumps, disposal bed, etc. • Varies based on existing conditions
Order of Magnitude Operating Costs	• $200 - $400 per year for maintenance agreement • Electrical consumption have been report to be 451 kWh per year
Acceptance by MOE and Health Units	• Ontario Building Code Approval of Waterloo Biofilter for meeting secondary effluent quality criteria (based on MOE letter dated June 26, 1996 and March 12, 1996) • Building Material Evaluation Commission (BMEC) Approval of Waterloo Biofilter Area Bed System for tertiary level treatment-April, 1999 • Health Units accept provided technology is approved under the BMEC. After BMEC approval, Health Unit checks distances, percolation times, etc. • MOE has accepted system as per C of A applications
Number of Installations and Service Life	• Number of systems in Ontario is greater than 1 300 • First installations in Ontario began in 1991 with many still in operating condition
Waterloo Biofilter Sub-surface Discharge	
Type of Sub-surface Discharge System based on Soil Type	See Below

Table C-2: Waterloo Biofilter	
Factors	**Treatment Specifications**
Design Criteria for Sub-surface System (based on Part 8 of OBC)	**Absorption System:** • Stone layer of 200 mm (minimum) over 250 mm (minimum) of sand (with percolation time of 6-10 min/com) • Provided that the underlying native soil has a percolation time of less than 6 min/cm, the water table shall be a minimum of 600 mm below the bottom of the stone layer required **Calculations for bed sizes are as follows:** • Minimum area of Sand layer: $A = QT/850$ • Minimum area of Stone layer: $A = Q/75$ for $Q \leq 3000$ L/d or $A = Q/50$ for $Q < 3000$ L/d Q = design flow (L/d) T = soil percolation rate (min/cm) • For Model #16 – 1600 L/d A = (1600 L/d)(50 min/cm) / 850 = 94 m^2 of Sand A = (1600 L/d) / 75 = 21 m^2 of Stone Therefore the bed area will be 94 m^2 • For Model #11 – 1100 L/d A = (1100 L/d)(50 min/cm) / 850 = 65 m^2 of Sand A = (1100 L/d) / 75 = 15 m^2 of Stone Therefore the bed area will be 65 m^2
Bed size (m/d) based on Soil Type. (Analysis used hydraulic load calculations for determining area)	1 min/cm < T $\leq$ 20 min/cm, Area = 250 m^2 20 min/cm < T $\leq$ 35 min/cm, Area = 313 m^2 35 min/cm < T $\leq$ 50 min/cm, Area = 417 m^2 T > 50 min/cm, Area = 625 m^2
Minimum Lot Area required for Treatment System per Soil Category (sum of disposal system and treatment unit area)	1 min/cm < T $\leq$ 20 min/cm, Area = 275 m^2 20 min/cm < T $\leq$ 35 min/cm, Area = 338 m^2 35 min/cm < T $\leq$ 50 min/cm, Area = 442 m^2 T > 50 min/cm, Area = 650 m^2
Does the system meet MOE reasonable use policy requirements?	• Typically obtains 10 - 15 mg/L TN or 75-80% removal of TN (including both Biofilter and Septic Tank operations) by recycling flows 20-30 times the design flow/day back to septic tank • If removal through disposal system is included, may meet reasonable use
Life Expectancy of Sub-surface System	• Manufacturer predicts that >90% of systems will last +20 years and 5% will last 5 years
Acceptance of Sub-surface System by MOE and Health Unit	• MOE developed sizing calculations • Health Unit relies on MOE/Building Code evaluation
Maximum Observed Life of Sub-surface System	• Bed: 20-30 yrs, if installed and designed in align with capacity and soil conditions • Shallow Buried Trench: more maintenance required but still capable of 20+ yr sub-surface system life

Table C-2: Waterloo Biofilter	
Factors	**Treatment Specifications**
Waterloo Biofilter Risk Assessment	
Potential for Treatment System Failure	Mostly related to use of disinfectant in a household (or other chemicals)
Remedial Step to Correct Equipment Failure	• Remove source of chemicals, fats, etc. • Pump failure, replace pump
Overall Impact of Equipment Failure on System Performance	• Equipment failure does not affect bed because system stops putting water through bed • Backed up sewage into yard is possibility but this is a "quick fix"
Potential for Sub-surface System Failure	• Bed fails based on excessive flows (ponding in bed)
Remedial Step to Correct System Failure without Contingency for Sub-surface System Replacement	• Remove bed and put new bed in soil underneath, Bed should be fine provided it was not disturbed • Remediate bed • Shallow buried (pressurized) trenches, no options if remediation efforts fail
Remedial Step to Correct System Failure with contingency for Sub-surface System Replacement	• Remove bed and put new bed in soil underneath, Bed should be fine provided it was not disturbed • Remediate bed • Shallow buried (pressurized) trenches, remediate or replace in another location

Table C-3: FAST Canada	
Factors	**Treatment Specifications**
FAST Treatment System	
Design Criteria	Fixed film, aerated system using combo of attached and suspended growth Pre-engineered, therefore flows are calculated and system is specified based on flow • MicroFAST 0.5 flow range: 1 300 to 1 900 L/d • MicroFAST 0.75 flow range: 1 900 to 2 800 L/d • MicroFAST 0.9 flow range: 1 900 to 3 400 L/d • MicroFAST 1.5 flow range: 2 850 to 5 700 L/d
Treatment Capacity (L/d)	For residential units capacity ranges from 1 900 to 10 000 L/d
Treatment Performance for Nitrate (mg/L)	• TN: <10 mg/L, >70% reduction (Note: all models include recirculation) • TKN: < 10 mg/L • Nitrate: < 5 mg/L
Treatment Performance for BOD, TSS and TP (mg/L)	• BOD: < 10 mg/L • TSS: < 10 mg/L • P: no removal
System Reliability	Smith & Loveless System Certifications: • U.S. Coast Guard • Canadian Great Lakes • UK Department of Trade • National Sanitation Foundation (NSF) International Standard 40, Class I • International Maritime Organization (IMO) • 2 year warranty available, will soon be upgraded to 5 years • If chemicals dumped, or other misuse by owner, warranty may be void • If treatment system fails, can pump out solids and will remediate itself • Can also easily replace media if necessary • No pumps required, system on grade
Potential for Odour Formation	• Chemicals flushed into system in sufficient quantity, could kill off bacteria and cause odour • If blower fails, no oxygen, anaerobic, could result in odour
Maintenance Requirement	**Area Bed:** Conduct sampling and testing in accordance with the requirements of the OBC • once during first 12 months • thereafter every 48-month period **Shallow Buried Trench:** • Once during first 12 months, thereafter once every 12 months (and between 10 to 18 months of previous sampling event)
Frequency for Media Replacement	• PVC media, does not corrode • Never have to replace

Table C-3: FAST Canada	
Factors	**Treatment Specifications**
Monitoring Requirement	Yearly for shallow buried trench
Order of Magnitude Capital Cost	• \$11 000 to \$13 000 for 1 900 L/d (MicroFAST 0.5) system installed • \$12 000 to \$14 000 for 2400 L/d (MicroFAST 0.75) system installed • both vary based upon pre-existing conditions • these capital cost estimates also include the cost of a two (2) year inspection plan
Order of Magnitude Operating Costs	• Electricity: 0.25 kw blower (for MicroFAST 0.5, 0.75 and 0.9 systems) • No chemicals • 2 visits per year at \$75 per visit for total of \$150 per year is typical after 2nd year for maintenance • Blower has 2-yr warranty, 7-yr life expectancy, and a \$525 replacement cost
Acceptance by MOE and Heath Units	• Building Material Evaluation Commission (BMEC) Approval of Bio-Microbic Area Bed System (models MicroFAST 0.25, 0.75, 0.9, and 1.5) for tertiary level treatment - November, 2004 • Approved for a Northern Ontario Lodge >10,000 L/d for a C of A by MOE • Prior to BMEC Approval the systems had been approved in certain areas: Ottawa, Lucan, Lambton County
Number of Installations and Service Life	• 130 residential units installed in Ontario (in 2004 and 2005) • Service life of system 25 years • 400-500 installs in Ontario (in 2006 and 2007) • More installations in U.S. where max. observed life is 30 years
FAST Sub-surface Discharge	
Sub-surface System based on Soil Type	**Shallow Buried Trench (Clay):** • majority of systems employ shallow buried trench follow Building Code specifications • shallow buried trench for percolation times 125 min/cm or less • Other disposal systems provided at owner's request

Table C-3: FAST Canada	
Factors	**Treatment Specifications**
Design criteria for sub-surface system (based on Part 8 of OBC)	**Adsorption System:** • Stone layer of 200 mm (minimum) over 250 mm (minimum) of sand • The water table, rock, or soil with a T time of 6 or less or greater than 50 min/cm: • shall be a minimum of 600 mm below the bottom of the stone layer required **Stone** • Q <3 000L/d: the area shall be such that the loading on the stone layer does not exceed 75 L/m^2 per day • Q >3 000L/d: the area shall be such that the loading on the stone layer does not 50 L/m^2 per day **Sand** • Area of sand layer: • A = QT/850 where A = the area of contact, m^2 Q = the total daily design flow, L and T = the lesser of 50 and the percolation time of the underlying soil, min/cm • Calculations from BMEC. Suggested that the dimensions of the bed be in a 2:1 or 3:1 ratio in order to encourage best flow characteristics for moving effluent away from the bed and into surrounding soil. • When the sand layer is installed in or on soil having a T time of greater than 15 min/cm, the sand layer shall extend at least 15 m beyond the perimeter of the system or distribution pipes if utilized, in any direction which the effluent entering the soil will move horizontally **Shallow Buried Trench:** • Length of distribution pipe (L) shall not be less than 30 m when constructed as a shallow buried trench
Bed Size (m/d) based on Soil Type. (analysis utilized hydraulic load calculations for determining area)	1 min/cm < T ≤ 20 min/cm, Area = 250 m^2 20 min/cm < T ≤ 35 min/cm, Area = 313 m^2 35 min/cm < T ≤ 50 min/cm, Area = 417 m^2 T > 50 min/cm, Area = 625 m^2
Minimum Lot Area required for Treatment System per soil category (sum of disposal system and treatment unit area)	1 min/cm < T ≤ 20 min/cm, Area = 275 m^2 20 min/cm < T ≤ 35 min/cm, Area = 338 m^2 35 min/cm < T ≤ 50 min/cm, Area = 442 m^2 T > 50 min/cm, Area = 650 m^2
Does the system meet MOE reasonable use policy requirements?	Yes, see TN removals above
Life Expectancy of Sub-surface System	30 years, will not plug (or can remediate), System is made out of plastic

Table C-3: FAST Canada	
Factors	**Treatment Specifications**
Acceptance of Sub-surface System by MOE and Health Unit	• MOE developed sizing calculations • Health Unit relies on MOE/Building Code evaluation
Maximum Observed Life of Sub-surface System	At least 20 years, 30 years (potentially) in United States
FAST Risk Assessment	
Potential for Treatment System Failure	• Chemicals, paint, etc. discharged by owner could cause death of system • Problem with blower results in no oxygen, therefore anaerobic power outage, no air
Remedial Step to Correct Equipment Failure	Pump out solids
Overall Impact of Equipment Failure on System Performance	• If shallow buried trench used, will no longer meet tertiary effluent requirements and could plug • Can remediate build-up in trench when system is operating properly, as high dissolved oxygen (DO) levels allow for remediation of bed
Potential for Sub-surface System Failure	• If system fails, shallow buried trench could plug • If hydraulic overloading, could have breakthrough
Remedial Step to Correct System Failure without Contingency for Sub-surface System Replacement	• Remediate shallow buried trench by ensuring system working properly. • High DO levels will allow bed to remediate • If conventional bed, can remediate as well
Remedial Step to Correct System Failure with Contingency for Sub-surface System Replacement	• Remediate using existing system with high DO levels inherent in treatment • Install new shallow buried trench disposal system

APPENDIX B
SUSTAINABLE DESIGN FEASIBILITY STUDY REPORT

Grand Bend Sewage Treatment Facility Upgrade – Sustainable Design Feasibility Study

Final Report

October 2008

Municipality of Lambton Shores

Project No. 07-8597-5000

Submitted by

Dillon Consulting Limited

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1. INTRODUCTION

It is anticipated that the Grand Bend Sewage Treatment Facility (STF) would be upgraded and expanded from a lagoon process to a mechanical treatment to accommodate future flows and to provide a high quality effluent. This feasibility study considered various sustainable design concepts for the STF expansion and upgrade to reduce energy consumption and greenhouse gas emissions associated with conventional municipal mechanical sewage treatment facilities. Energy efficient measures tend to focus on the use of existing local resources, as opposed to concentrated energy resources. Renewable energy technologies tend to be environmentally preferable to conventional technologies particularly those conventional technologies that rely on fossil fuel combustion.

The following sustainable design concepts were considered for the expansion and upgrade of the Grand Bend STF:

- Reduce energy demand from the grid through the use of on-site renewable source(s) of energy, including:
    - Solar photovoltaic (PV) system
    - Wind turbine system
    - Bio-energy / biomass system
    - Geothermal system.
- Reduce energy consumption and provide energy efficient process design, such as:
    - Recovery of heat from treated effluent
    - Recycling of blower waste heat (if blowers are included in the biological treatment process).
- Reduce energy consumption and provide greenhouse gas emission savings by including an innovative approach to sludge management.

Assumptions used in this feasibility study include the following:

- The upgraded Grand Bend STF will include a new treatment plant building.
- Energy efficient process design equipment to be included as part of the upgrade will likely include: dissolved oxygen control to reduce the output of blowers, variable speed sludge return pumping to allow pumps to operate at a lower speed and output when flows are low, and flow pace features for the UV system to reduce the number of lamps in service. These systems were not evaluated as part of the study, since the implementation of the systems has become the state-of-the-industry.

- Power generated on-site would be used on-site only, with no excess power supplied back to the grid.
- The heat recovery systems considered, including effluent and blower heat recovery systems, were evaluated based on a heat requirement of 140 kW for the new treatment plant building.
- The solar photovoltaic system and wind turbine system were evaluated based on the following power requirements:
  - 400 kW – estimated power demand associated with the upgraded Grand Bend STF.
  - 200 kW – minimum power demand considered for the upgraded Grand Bend STF, which would likely require the use of another energy source.
- The biomass or bio-energy system would be a co-generation system, specifically a reciprocating engine, associated with an anaerobic sludge digestion system. The co-generation system would convert the methane generated in the anaerobic sludge digestion process into carbon dioxide, which is a much less potent greenhouse gas. The co-generation system would produce heat and power. The digester gas, or biogas, from the anaerobic sludge digester was assumed to be 60% methane by volume.
- The current cost of electricity is considered to be $0.1113 per kWh. This is based on Ontario Hydro's Regulated Price Plan as well as charges including delivery, regulatory and debt retirement. It is assumed that the price of electricity will increase by 3% per year over the next 20 – 30 years.
- If successful, any funding for the capital cost of the Grand Bend STF Expansion and Upgrade could be used to cover the cost of the implementing the recommended sustainable design components. For the purposes of this report, the costs presented do not account for any reductions achieved through funding or other incentives.

2. RENEWABLE ENERGY SOURCES

2.1 Solar Photovoltaic System

There are two types of solar energy systems, active and passive systems. Active solar energy involves solar panels, which harvest the energy from the sun and convert it into electricity. Passive solar energy does not involve solar panels, wires or electricity unlike active solar energy. Passive solar heating is the selective use of solar energy to provide space heating in buildings by using building material that can store heat from solar gains during the day and release it at night.

The use of an active solar energy system including photovoltaic cells or solar panels for the STF upgrade was investigated. Photovoltaic cells consist of a thin wafer or strip of semi-conductor material that generates a small current when sunlight strikes them. Solar energy is "free", and as long as the sun is shining it is a viable resource. Photovoltaic systems may have a series of batteries where the electricity is stored until it is needed. These batteries typically provide three days of autonomy, which means the batteries have enough stored electricity to operate for three days without any sunlight. **Figure 1** illustrates a typical solar photovoltaic system.

Two solar photovoltaic system alternatives were considered for the Grand Bend STF upgrade and are outlined in **Table 1.** An average of eight hours of sunlight per day is assumed for both alternatives. The 400 kW wind turbine alternative includes a battery sized for three days of autonomy, or no sunlight.

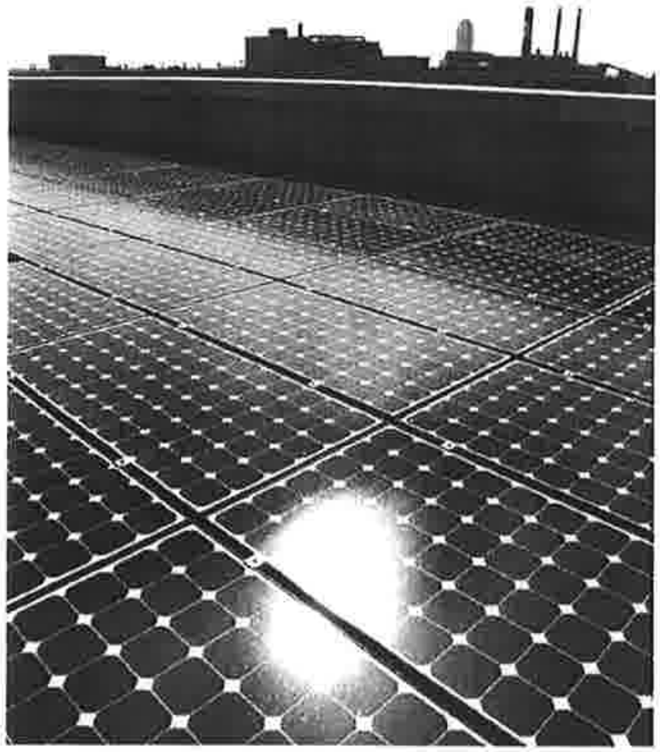
Table 1 – Photovoltaic System Alternatives for the Grand Bend STF Upgrade

System Capacity	Description	Footprint of Panels (m^2)	System Output (kWh/yr)
200 kW	no battery included, only supplies electricity during periods with sunlight	1,370	584,000
400 kW	includes a battery, extra energy is stored to supplement electricity demands during low or no sunlight hours	2,740	1,168,000

A solar photovoltaic system is modular and can be expanded. The 200 kW solar system does not include a battery, but a battery can be added to the system at any time. The systems were sized assuming eight hours of sunlight and a 200 kW demand for the upgraded STF. The 200 kW solar system would feed electricity to the plant as it is harvested from the sun. The 400 kW solar system would be able to harvest extra energy from the sun and store the electricity in a battery for later use. Assuming only eight hours of sunlight, the 400 kW solar system would supply electricity for approximately 16 hours and must be supplemented with power from the grid for the remainder of the day.

Multiple photovoltaic cells can be arranged into modules in an array of any size. **Appendix A** provides technical information regarding proprietary solar photovoltaic systems considered as part of this study.

Figure 1 - Solar Panel System



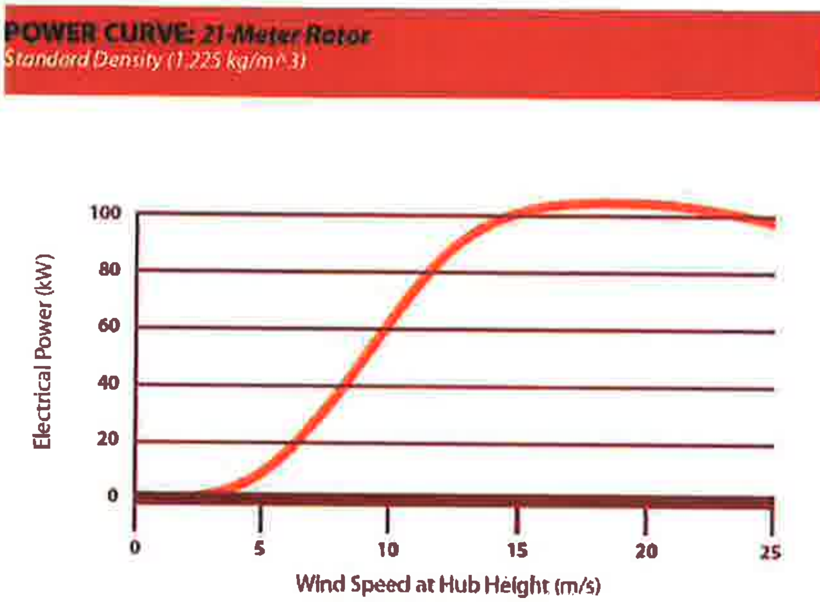
2.2 Wind Turbine System

Wind turbines convert the energy of moving air into electricity. The energy available from the wind increases in proportion to the cube of wind speed, which typically increases with the height above the ground. Therefore, the faster the wind blows, the more energy will be provided to the STF. The average wind speed in Grand Bend is approximately 5 m/s, based on Goderich airport weather data. Typically the wind speeds are higher in the winter than in the summer for the Grand Bend area. **Figure 2** illustrates a typical wind turbine arrangement.

Figure 2 - Wind Turbines

The average wind speed at Grand Bend would provide only a low efficiency for the wind turbine. As shown in **Figure 3**, a wind turbine that is rated to operate at a wind speed of 15 m/s would provide a power output of 100 kW. At a speed of 5 m/s, the power output would only be approximately 10 kW, which is considerably lower.

Figure 3 – Typical Wind Turbine Performance Curve
(Northern Power Northwind 100 Turbine)



VM (m/s)	POWER (kWe)
1	0.0
2	0.0
3	2.2
4	5.2
5	10.1
6	17.3
7	27.3
8	42.1
9	58.1
10	70.4
11	80.7
12	88.7
13	94.2
14	97.6
15	99.6
16	101.3
17	102.3
18	102.6
19	102.5
20	102.0
21	101.3
22	100.3
23	99.3
24	98.3
25	97.5

Wind turbines do not require as much land area as solar photovoltaic cells of the same output. Wind turbines could potentially pose a problem with land use planning due to the typical heights of these systems. The installation of these systems may be restricted from being installed in a certain area by municipal or city by-laws. The Municipality of South Huron has a by-law in place that restricts the installation of wind turbines within a distance of three times the height of the turbine from a residence. This by-law would not affect the use of wind turbines at the Grand Bend STF site.

Battery and other storage systems may be used with wind turbines to store the electricity before it is consumed. A wind turbine at the STF site is anticipated to provide a relatively constant output that is quite low compared to the required load of the upgraded Grand Bend STF. For this study, the use of a battery for a wind turbine was not considered due to the low power output. The STF could consume the electricity directly from the wind turbines, and have an additional source of electricity. The following table, **Table 2,** shows the wind system alternatives considered for the STF upgrade.

Table 2 – Wind Turbine System Alternatives for the Grand Bend STF

System Capacity (kW)	Number of Turbines	System Output (kWh/yr)
200	2	123,000
400	4	245,000

Wind turbines are commercially available in a vast range of sizes. **Appendix B** provides technical information regarding proprietary wind turbine systems considered as part of this study.

2.3 Bio-Energy Cogeneration System

A biomass or bio-energy engine operates similarly to a normal gas powered reciprocating engine, except that it runs on biogas or a biofuel rather than regular unleaded or diesel fuels. It is estimated that approximately 120 kW of power is available in the methane gas that would be produced by an anaerobic sludge digestion system at the upgraded STF. Based on a biogas engine electrical efficiency of approximately 42%, the engine would provide a total power output of 50 kW. Some of the 58% loss of energy would be heat, which would be recovered by an associated heat recovery system. The heat recovered from the engine could be used to heat the new treatment plant building. **Figure 4** illustrates a typical bio-energy reciprocating engine.

The bio-energy system makes use of an available fuel, thus reducing the amount of electricity required from the grid. It also reduces the carbon footprint of the STF by burning the methane as fuel rather than releasing this potent greenhouse gas to the atmosphere. A flare would still be needed in order to burn off the methane, in the event that the reciprocating engine is not in operation.

Appendix C provides technical information regarding a proprietary biogas reciprocating engine.

Figure 4 – Bio-Energy Cogeneration System

2.4 Geothermal System

A geothermal heating system uses the heat that is either in the ground, or a nearby source of water (groundwater or surface water such as a lake, river, pond, treated effluent, etc.) as the source of heat for buildings. It is the most energy efficient method of heating a building on account of the high efficiency. Geothermal systems were considered for heating only, as a geothermal power plant was not considered feasible for this application. Geothermal systems may also be used for the supply of domestic hot water, although this was not investigated as part of this study.

The use of the ground as the source of heat was preferred versus the use of surface water, such as Parkhill Creek. There is risk that Parkhill Creek, which flows west of the STF site, may freeze in the winter and not allow the heat pump to operate properly. The use of Lake Huron as a heat source was also not considered feasible, as it would be difficult and cost prohibitive to run the pipes the distance to the Lake. It would be difficult to install geothermal piping in a surface water source without leaving some environmental impact on the body of water. A ground-source system with a horizontal piping arrangement onsite is preferred due to cost and ease of installation.

Heat recovery of the treated effluent is a geothermal system which uses the effluent as the source of heat. This system is outlined in further detail in Section 3.2.

A ground-source heat pump uses the heat that is located in the ground or the groundwater for both heating and cooling. A series of pipes are laid out underground and typically a fluid, such as glycol, is run through these pipes by a pump. The glycol is cooler than the ground temperature, so the ground heats up the glycol. The glycol then gets pumped through a heat exchanger which extracts the heat from the glycol and uses this heat for the building. The opposite can take place in the summer, where the glycol transfers the heat to the ground which is cooler and the heat exchanger uses the cool glycol for cooling purposes.

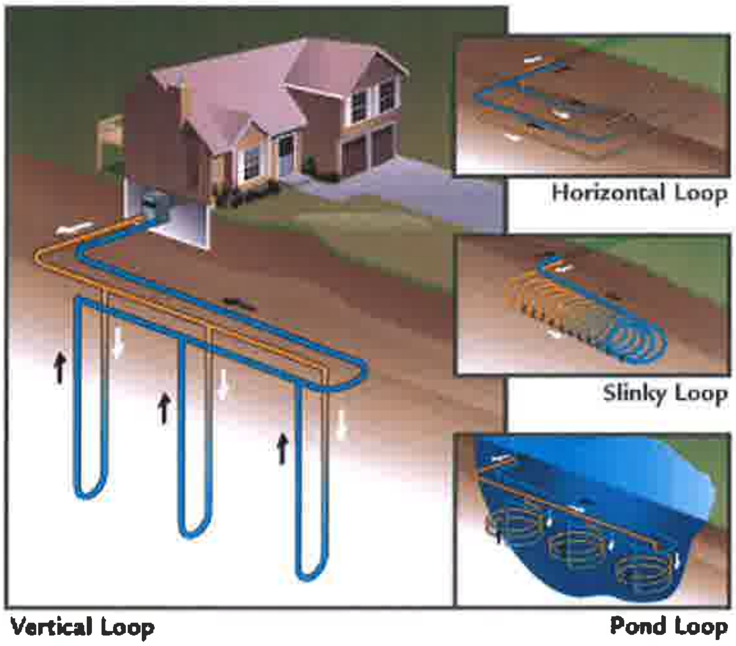
There are two piping configurations for an in-ground geothermal system. The pipes can be laid out horizontally, sitting below the surface of the ground, or they can be inserted vertically at some depth below the ground surface. The horizontal layout requires a large area of land where the pipes can be laid flat underground, which is less expensive and easier to install. A vertical pipe configuration requires digging very deep holes into the ground and inserting the pipes into these holes. This configuration is typically used when there is only a small area of land to work with. A vertical piping configuration may not be feasible if there is rock beneath the surface and it would be too difficult or expensive to drill through. **Figure 5** provides an illustration of vertical and horizontal piping layouts, as well as other less common arrangements for in-ground geothermal heating.

For the upgraded STF, a horizontal piping layout for a geothermal system is feasible as there is sufficient area in either Lagoon Cell No. 3 or Lagoon Cell No. 4 (easterly cell located nearest to Mollard Line), which will be decommissioned as part of the upgrade. An approximate area of 30,000 m^2 is required to arrange the pipes horizontally. Piping in a horizontal arrangement is typically installed 4-6 m below grade.

If a heating demand associated with a building was 100 kW, the same amount of power would be required to heat the building using an electric resistance heater. But if a geothermal heat pump is used with a typical coefficient of performance of 3.0, only 33.3 kW of power would be required to heat the building. Geothermal heating costs are generally 1/3 of traditional heating costs, which would then 'pay-back' the difference in the capital cost and installation of the geothermal equipment. A geothermal system also greatly reduces the carbon footprint on the environment.

The capital cost to install such a system is higher than a traditional furnace or boiler, but the pay-back period would be relatively short for a new building. Geothermal systems have been installed in Canada with pay-back periods of ten years or less. The pay-back period is dependent on the soil conditions at the site.

Figure 5 - Geothermal System Piping Arrangements



Appendix D provides technical information on geothermal heating systems.

3.0 HEAT RECOVERY SYSTEMS

Heat recovery systems were considered for heating the treatment plant building.

3.1 Blower Waste Heat Recovery

Blowers may be required to provide air to the aeration system of the upgraded Grand Bend STF. Blowers would be situated in a room of the new treatment building. It can be assumed that 10% of the power input to the blower will be lost as heat. Installing a heat recovery system can capture this lost heat and use it to heat other portions of the treatment plant building.

3.2 Effluent Heat Recovery

The principal of operation of an effluent heat recovery system is the same as a geothermal ground-source heat pump outlined in Section 2.4. The effluent that is leaving the STF is used as the heat source as opposed to the ground. **Figure 6** illustrates an effluent heat recovery system.

An effluent heat recovery system, consisting of a heat exchanger and heat pump, would remove the heat from the effluent of the sewage treatment facility and use it to heat the digester and the treatment plant building. This type of system is an "environmentally-friendly" alternative to traditional building heating. Effluent heat recovery systems will conserve energy and generally have a pay-back period of less than the expected lifetime of the system. The heat pump can also be reversed and used for cooling during summer months.

Figure 6 – Treated Effluent Heat Recovery System

Appendix E provides technical information on heat exchangers.

4.0 EVALUATION OF SUSTAINABLE DESIGN CONCEPTS

The table below provides an evaluation of the various sustainable design concepts that were considered for the expansion and upgrade of the Grand Bend STF. **Table 4** provides a cost comparison of the various alternatives.

Table 3 – Evaluation of Sustainable Design Concepts

Criteria	Alternative 1: Solar PV Systems	Alternative 2: Wind Turbine Systems	Alternative 3: Bio-Energy System	Alternative 4: Geothermal System	Alternative A: Blower Waste Heat Recovery	Alternative B: Effluent Heat Recovery	Alternative C: Do Nothing	Preferred Alternatives
Service and Reliability								
Flexibility and reliability of service	• A constant supply of electricity can be provided with the use of a battery	• Provides a relatively constant supply of electricity, but at a low output	• Does not provide a constant supply of electricity	• Constant ground temperature allows reliable operation with a constant supply of heat • Can also be used for cooling in the summer	• Does not provide a constant supply of heat (only when blowers are running) • Only required if treatment system includes blowers • Note: preliminary preferred treatment design option does not require blowers	• Provides higher heat content when waste water temperature and flow is greater	• Power supplied from the grid is highly reliable	1, 4 & C
Ease of construction and operation maintenance	• Clean and replace solar cells	• Sophisticated construction compared to other alternatives	• Engine maintenance required	• Pump maintenance required • Sophisticated installation	• Minimal maintenance	• Pump maintenance required • Complex construction as not many systems in operation	• No maintenance required	1, 4, A, B & C
Environmental Impacts and Land Use Compatibility								
Approximate Footprint / size of system	• 2,740m^2 for solar cells	• Typical height of turbines is approximately 40m • Footprint of 90,000m^2	• Footprint of system including engine and digester is approximately 1,400m^2	• 30,000m^2 for piping in a horizontal arrangement	• 10m^2 to be accommodated within building	• 9 m^2 for the heat pump to be accommodated within building • 113m^2 for the heat exchanger for a passive system configured along the effluent discharge pipe	• No footprint	1, 2, 3, A, B & C

Criteria	Alternative 1: Solar PV Systems	Alternative 2: Wind Turbine Systems	Alternative 3: Bio-Energy System	Alternative 4: Geothermal System	Alternative A: Blower Waste Heat Recovery	Alternative B: Effluent Heat Recovery	Alternative C: Do Nothing	Preferred Alternatives
Environmental Impacts and Land Use Compatibility								
Potential loss / adverse impact on natural environment features	--	• Noise generated as a result of turbine operation • Impacts on migration routes of birds	• Noise generated as a result of engine operation • Certificate of Approval (Air/Noise) is likely required	• Large amount of excavation required	• Housed within new building	• Housed within new building or along effluent discharge pipe	• No additional construction required, thus no additional impacts on the environment	1, 4, A, B & C
Permitting / regulatory requirements	• Exempted from Environmental Assessments and Screening due to capacity	• Exempted from Environmental Assessments and Screening due to capacity • Municipality of South Huron by-law puts restrictions on wind turbines	• Exempted from Environmental Assessments and Screening due to capacity	• Building permit approval by Municipality/County to comply with the Ontario Building Code	• Building permit approval by Municipality/County to comply with the Ontario Building Code	• Building permit approval by Municipality to comply with the Ontario Building Code	• No specific requirements	--
Cost and Associated Savings								
Approximate capital cost	$2 M - $5 M	$800,000 - $1,800,000	$125,000 for engine + $3,375,000 for digestion system and building = $3.5 M total	$178,000	Part of building HVAC system design, approximately $50,000	$100,000	No capital cost	2, 4, A, B & C
Approximate operating and maintenance costs	$5,000 -$10,000 per year	$4,000 - $8,000 per year	$4,000 per year	$1,000 per year	N/A	$5,000 per year	No operating and maintenance cost	4, B & C
Funding Opportunities	• More incentives currently available for passive solar thermal heating systems	--	• More incentives for farm-based systems.	• Incentives available for renewable heat	--	• Incentives available for renewable heat	--	Note: Funding opportunities are available to cover the capital cost of the ST upgrade

Table 4 - Cost Comparison of Alternative Sustainable Design Concepts

	200 kW Solar System (no battery)	**400 kW Solar System (with battery)**	**200 kW Wind Turbine System**	**400 kW Wind Turbine System**	**Bio-Energy System with Heat Recovery**	**Blower Heat Recovery**	**Geothermal Heating**	**Heat Recovery from Effluent**	**Do Nothing**
Approximate Capital Cost	$2,000,000	$5,000,000	$900,000	$1,800,000	$3,500,000	$50,000	$178,000	$100,000	$0
Operation and Maintenance Cost per Year	$10,000	$10,000	$4,000	$8,000	$5,000	$500	$1,000	$5,000	$0
Operating Life of System*	25 years	25 years	30 years	30 Years	25 years	25 years	25 years (estimated)	20 years	25 years (for some electrical system components)
Lifecycle Operation and Maintenance Cost	$250,000	$250,000	$120,000	$240,000	$125,000	$12,500	$25,000	$100,000	$0
Lifecycle System Cost	$2,250,000	$5,250,000	$1,020,000	$2,040,000	$3,625,000	$62,500	$203,000	$120,000	$0
Purchasing Power from Grid Over System Operating Life (Savings)**	$2,100,00	$4,700,000	$750,000	$1,500,000	$1,400,000	$122,000	$1,500,000	$900,000	$0
Net Savings for System	($150,000)	($550,000)	($270,000)	($540,000)	($2,225,000)	$59,500	$1,297,000	$780,000	$0
Present Value of Lifecycle Cost Savings***	$3,100,000	$6,900,000	$1,200,000	$2,400,000	$2,000,000	$177,000	$2,100,000	$1,200,000	$0

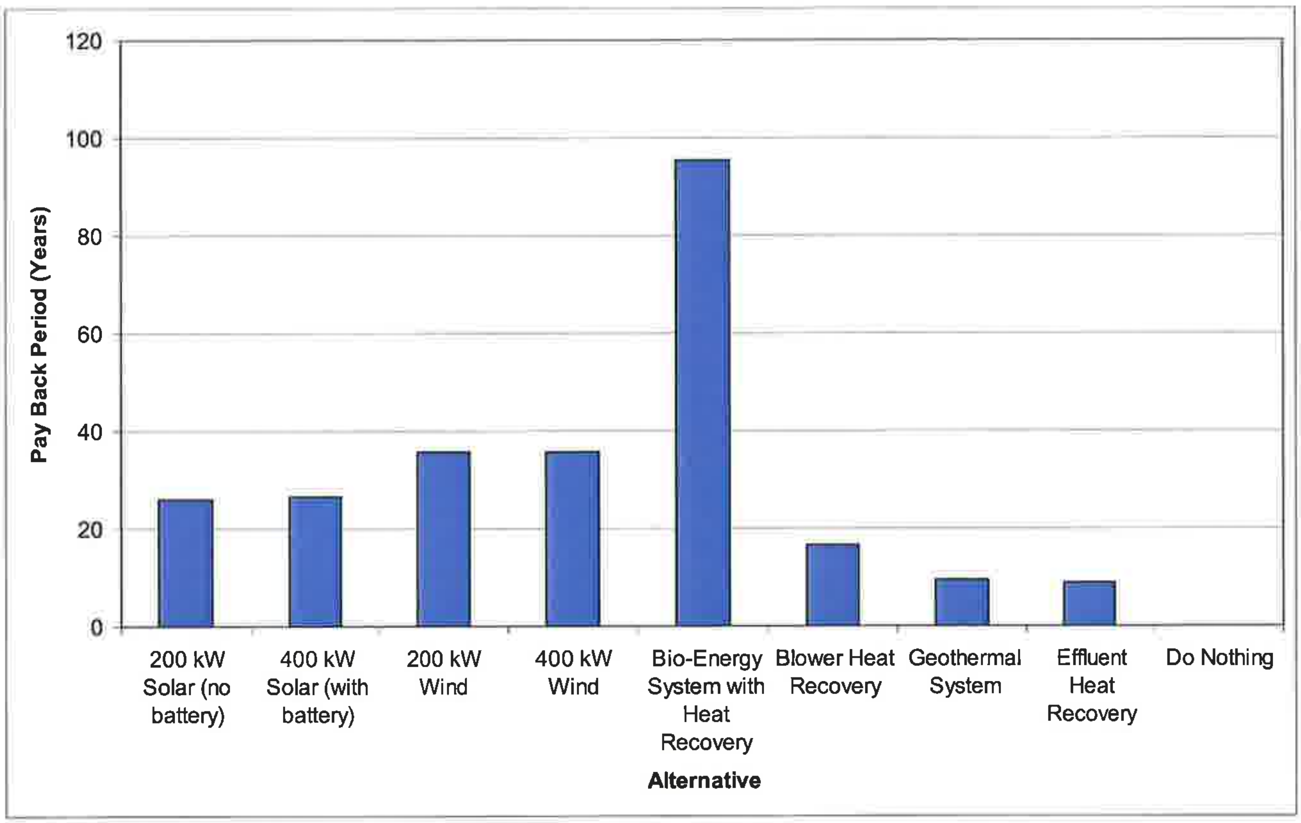
* Operating life of system based on input from equipment manufacturers.

** This is the electricity that would be required if the system was not in place and it assumes a baseline cost of $0.1113 per kWh as the current rate and a price increase of 3% per year.

*** This assumes an inflation rate of 2.5% per year.

Figure 7 provides the pay-back period for each sustainable design alternative. Some of the alternatives, including the wind and bio-energy systems, may not be feasible, as their pay-back period is longer than their anticipated operating life. The solar photovoltaic system has a pay -ack period that is nearly equivalent to their operating life. The geothermal and effluent heat recovery systems, on the other hand, will provide a "pay-back" well before their anticipated operating life is reached.

Figure 7 – Pay-Back Period for Sustainable Design Alternatives



The capital cost associated with each sustainable design alternative varies as shown in **Figure 8**. The biogas engine capital cost includes the cost of the anaerobic sludge digestion system, including digester cells, pumps, heat exchanger, and the flare.

Figure 9 provides the energy savings over a 20 year period vary for each alternative. A high capital investment does not necessarily imply a high degree of energy savings. In the case of the geothermal heating system, the highest energy savings is achieved with one of the lowest capital investments.

Figure 8 – Capital Costs of Sustainable Design Alternatives

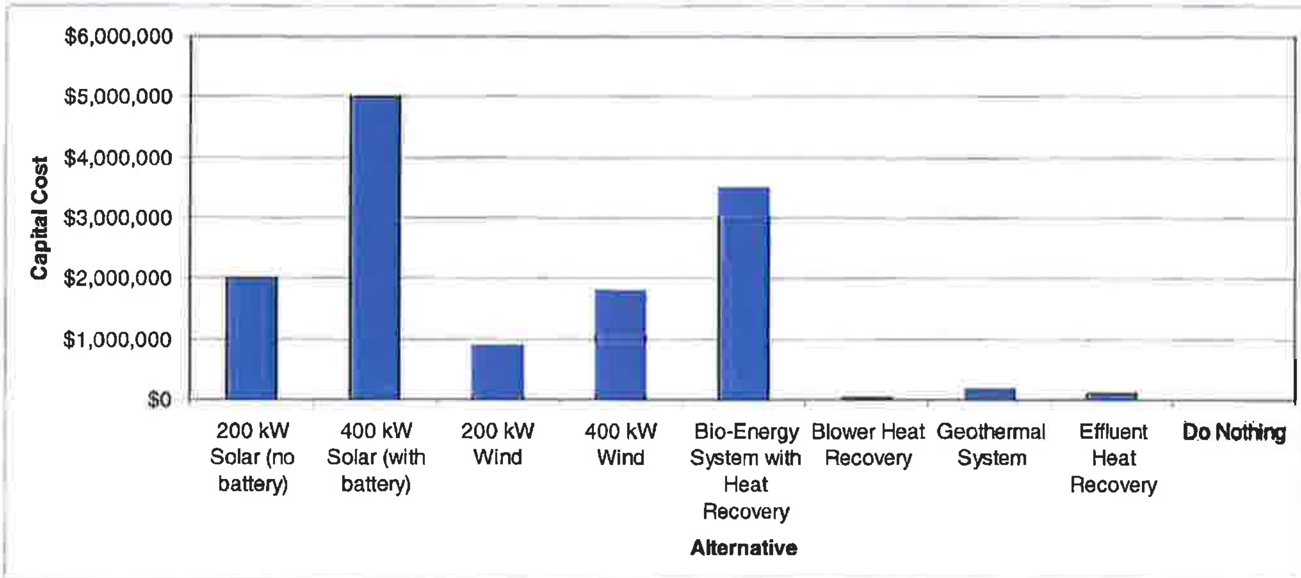


Figure 9 - 20 Year Energy Savings for Sustainable Design Alternatives

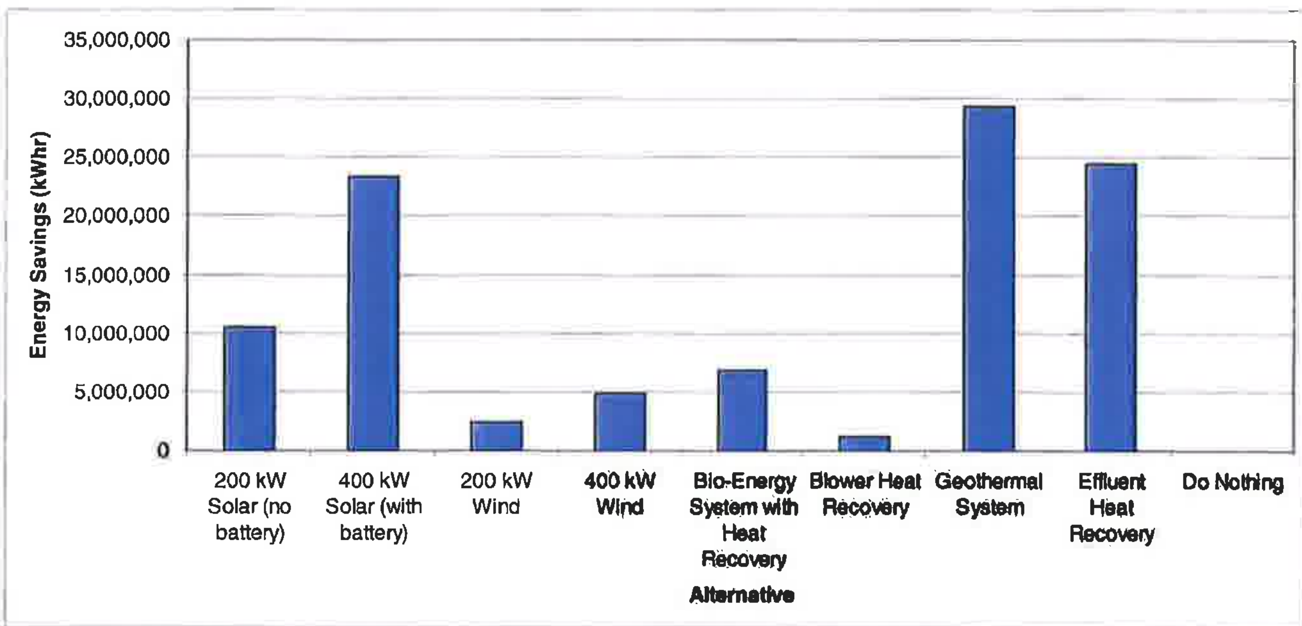
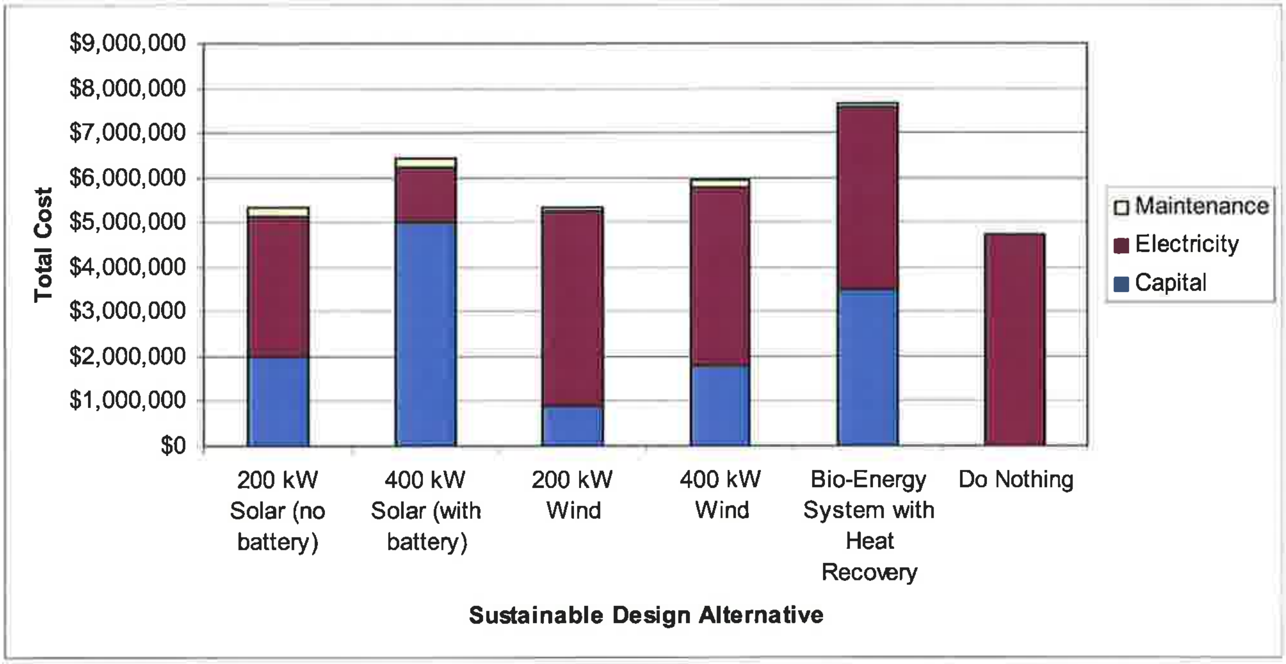


Figure 10 illustrates the 20-year life cycle cost for each renewable energy alternative, which includes capital costs, annual maintenance costs, and supplemental electricity costs from the grid required for the system over 20 years. The heating alternatives were not included in this figure since these systems generate heat only, and not usable electricity.

Figure 10 – 20 Year Life Cycle Cost for Renewable Energy Alternatives



As shown in **Figure 10**, the added capital cost for each sustainable design alternative significantly raises the 20-year life cycle cost. Funding provided through grants or incentives would reduce the capital and life cycle costs. **Figure 11** illustrates the 20-year life-cycle cost, including a fixed carbon tax of $1.00/GJ or $1.00/277.8 kWhr for grid supplied power, which is an approximation of the projected 2010 tax to be used in the province of British Columbia. Similarly to the British Columbia Carbon Tax, there was no tax applied to the sustainable design or renewable energy alternatives.

Figure 12 illustrates the carbon footprint or equivalent grams of carbon dioxide released per kWhr (CO_{2e}/kWhr) for each of the alternatives. The following assumptions were considered for the various types of energy:

- solar: 32 g CO_{2e}/kWhr
- wind: 10 g CO_{2e}/kWhr
- grid-supplied power: 335.7 g CO_{2e}/kWhr (based on Ontario's estimated 2007 electricity generation mix) (Kleiner, 2008 Climate Change News).

Figure 11 - 20 Year Life-Cycle Cost for Renewable Energy Alternatives Including Estimated Carbon Tax

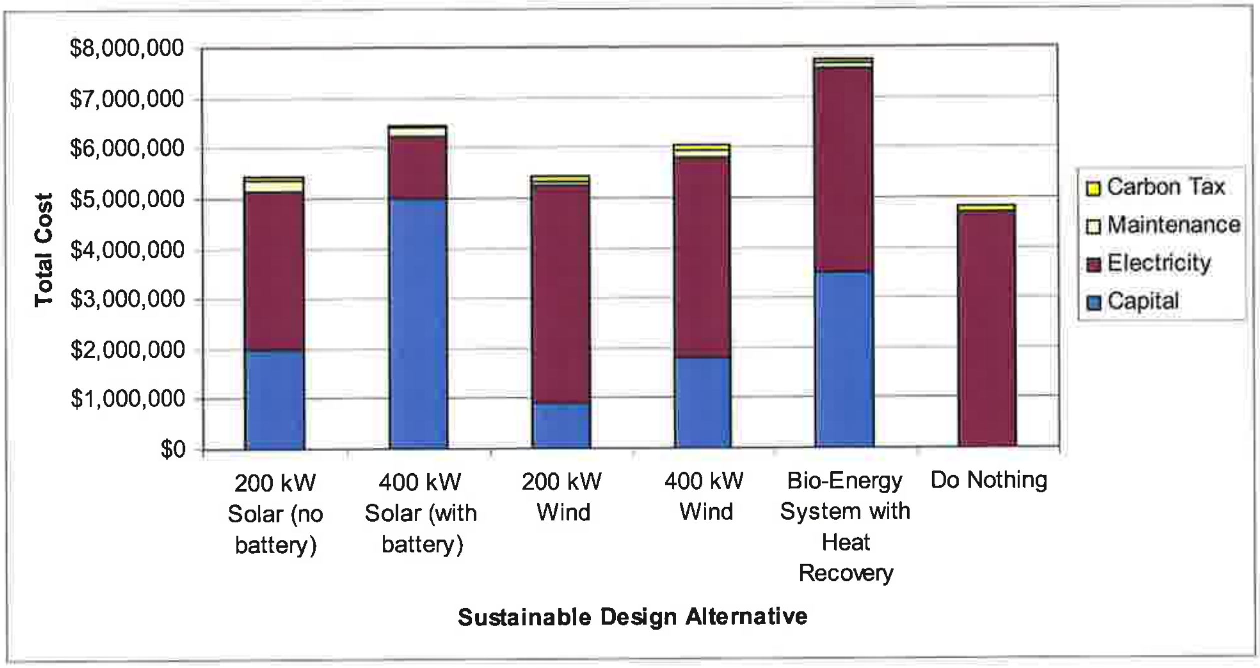
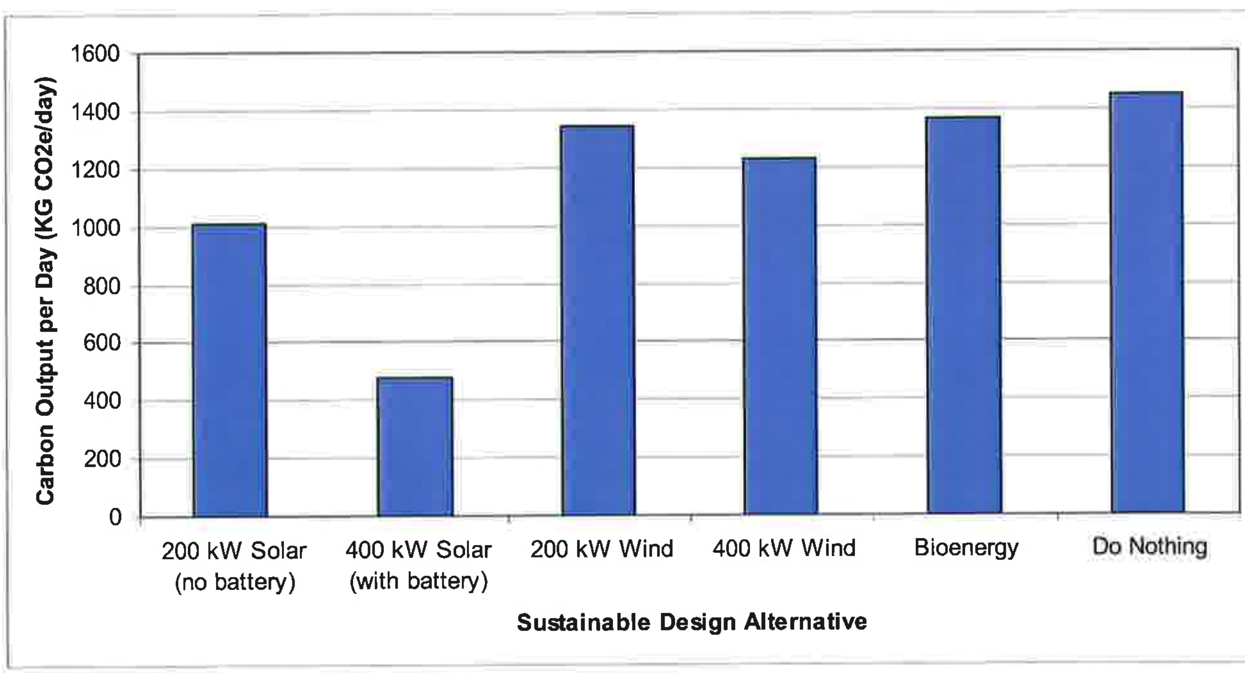


Figure 12 - Carbon Footprint per Day for Renewable Energy Alternatives



Based on the evaluation provided in **Table 3**, the preferred alternatives to consider for

Based on the evaluation provided in **Table 3**, the preferred alternatives to consider for implementation include:

- Solar photovoltaic system
- Geothermal system
- Blower waste heat recovery
- Effluent heat recovery.

Based on an evaluation of pay-back period and unit cost savings per day in **Figures 7 and 9**, the bio-energy alternative is not considered financially viable. The wind turbines also have a rather long pay-back period, which is beyond their design life. The wind turbine systems also have a high capital investment requirement for minimal energy savings. The solar photovoltaic system has a pay-back period that is roughly equivalent to the operating life of the system. This alternative warrants further consideration since the calculation was based on a conservative estimation of use.

Based on a unit cost savings per day, the biogas engine is not considered feasible. The solar capital investment is moderately high, and is around the break even point for the capital investment payoff. Both the geothermal system and effluent heat recovery have a very low capital investment required.

Based on **Figures 10 and 11**, the 200 kW solar (no battery) system and the 200 kW wind turbine system provide the lowest 20-year life cycle cost for the renewable energy alternatives, in comparison to the alternative of "do nothing." The wind turbine systems require a higher reliance on grid electricity, as more electricity is required to supplement these options. **Figure 12** illustrates that the two solar design alternatives have the lowest carbon footprint in terms of gCO_{2e}/kWhr.

The wind turbine systems as well as the bio-energy system were rejected based on the following:

- The capital cost of both systems is too high and not expected to pay off during the operating life of the system.
- Neither system supplies a constant supply of electricity:
  - Wind turbines are dependent on the wind which cannot be controlled;
  - The bio-energy system is dependent on sludge production and digestion rates, which would be variable.

Table 5 - Summary of Short-Listed Sustainable Design Alternatives

Alternative	Advantages/Disadvantages	Recommendation
Solar Photovoltaic System	• Provides a constant supply of electricity with the use of a battery • Modular system which could be increased in the future by adding additional panels and potentially a battery • Land is available within site for solar panels • Pay-back period is nearly equivalent to operating life	• Recommended for further consideration in Preliminary Design as a source of electricity
Effluent Heat Recovery	• Ease of installation in comparison to ground-source geothermal system • Less expensive installation costs in comparison to ground-source geothermal system • Adequate source of heat for the building similarly to the geothermal system • Low-maintenance design • Pay-back period of approximately seven years	• Recommended for further consideration in Preliminary Design to supplement heating requirements
Blower Waste Heat Recovery	• Low-maintenance design with essentially minimal operating and maintenance costs • Provides 5% of building heat requirement • Pay-back period of approximately 17 years	• Recommended for further consideration
Geothermal (ground-source) System	• Provides a constant supply of heat • Land is available within site for in-ground horizontal arrangement • Complex installation which typically involves the installation of pipes 4-6 m below ground for a horizontal piping configuration. • Low-maintenance design, although if any problems were encountered with the in-ground piping, fixing these problems would be difficult. • Pay-back period of ten years	• NOT recommended since effluent heat recovery system preferred form of heat supply

The solar PV system can be implemented in stages over time as the mechanical plant of the Grand Bend STF is expanded in phases. A potential strategy for the staged implementation of the solar PV system is provided in **Appendix F.**

5.0 SLUDGE MANAGEMENT

An innovative approach to sludge management was considered as part of this study. The existing lagoons have not been de-sludged and the sludge in these lagoons must be removed and managed as part of a plant upgrade. Also, waste sludge generated in the future during biological treatment must be treated and disposed of onsite or offsite. Offsite sludge disposal may involve:

- Landfilling: requires the transport of sludge and associated landfill tipping fees.
- Land application: requires the transport of sludge to approved sites
  (Note that waste sludge would likely have to be stabilized and dewatered onsite prior to offsite disposal).

Onsite sludge management could be accommodated through the following unit processes:

- Aerobic treatment:
  - Aerated sludge lagoon – to provide aerobic digestion of sludge
  - Sludge containment wetland – following the aerated lagoon, incorporates vegetation and natural habitat, and provides further treatment and storage of sludge (with no discharge).
- Anaerobic treatment:
  - Anaerobic sludge digestion: digestion in a closed digester tank where the amount of solids is decreased and the solids concentration of the digested sludge is increased, and
  - Co-generation system: a co-generation engine such as reciprocating engine, outlined in **Section 2.3** which generates heat and electricity

A sludge containment wetland is shown in **Figure 13**.

Figure 13 - Sludge Containment Wetlands

Table 6 - Summary of Onsite vs. Offsite Sludge Management

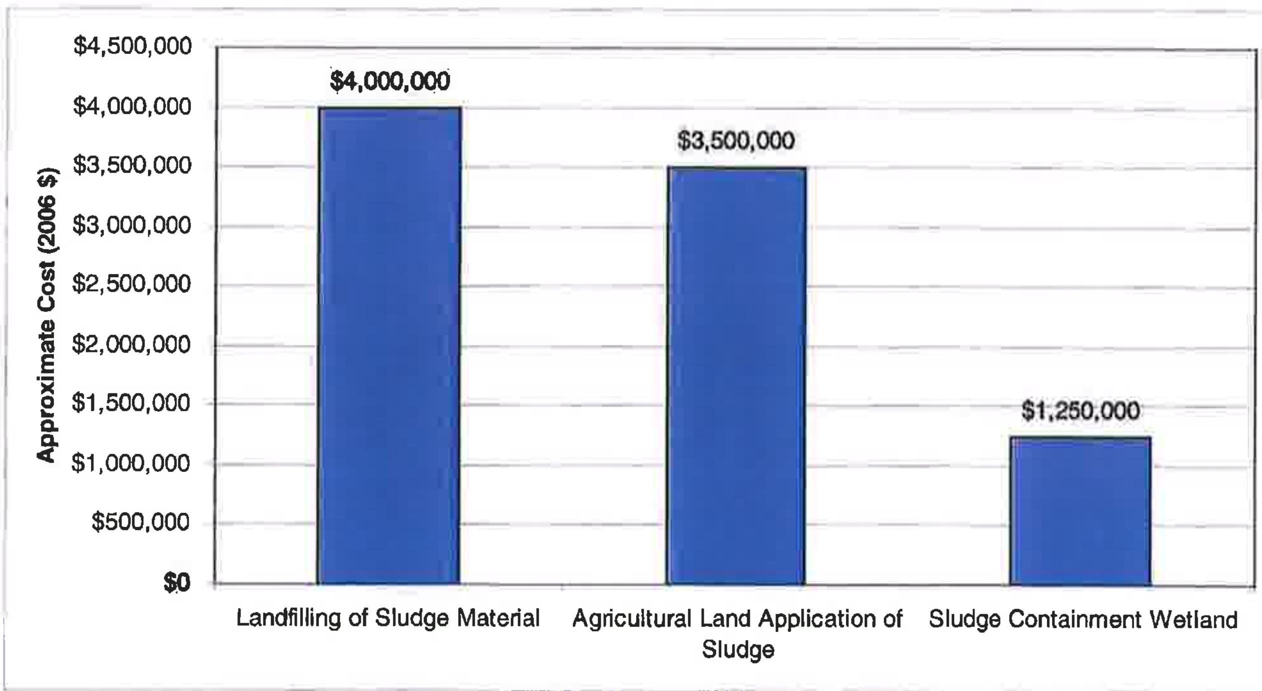
Alternative	Advantages/Disadvantages	Recommendation
Offsite Management – Land Filling	• Requires the transport of sludge and associated landfill tipping fee • Waste sludge would likely have to be stabilized and dewatered onsite prior to offsite disposal	• NOT recommended for further consideration since labour-intensive and requires use of off-site land (at an added cost)
Offsite Management – Land Application	• Requires the transport of sludge to approved sites • Waste sludge would likely have to be stabilized (digested) and thickened or dewatered onsite prior to offsite disposal	
Onsite Management – Aerobic Treatment	• Provides aerobic digestion of sludge • Incorporates vegetation and natural habitat • Provides further treatment and storage of sludge with no discharge • Tilbury sludge containment wetland saved the Municipality of Chatham-Kent and estimated $2.25 million.	• Recommended as preferred sludge management system
Onsite Management – Anaerobic Treatment	• Digestion in a closed digester tank • The amount of solids is decreased and the solids concentration of the digested sludge is increased • A co-generation system can be used to generate heat and electricity • Anaerobic sludge digestion is cost effective only if a co-generation system is included	• As outlined in Section 4, the anaerobic sludge digestion co-generation system (which included a reciprocating engine), was rejected as a potential alternative due to the prohibitive capital cost

The sludge management system recommended in **Table 6** is considered innovative since:

- available onsite land is utilized to accommodate the sludge management system,
- does not require frequent transportation of sludge offsite, and
- disposal costs such as landfill tipping fees are avoided.

Only a portion of the lagoon land area was required to accommodate the new Tilbury mechanical treatment plant, similarly to the anticipated Grand Bend STF Upgrade. The Tilbury lagoon sludge quality met the MOE Guideline requirements for agricultural disposal of biosolids. The capital costs of the various Tilbury lagoon sludge management alternatives are shown in **Figure 14**. A sludge containment wetland was identified as the preferred alternative for the Tilbury Sewage Treatment Plant (STP) Upgrade. Tilbury lagoon sludge was used as a growth media for the wetland. The Tilbury sludge containment wetland had a combination of shallow earthen berms and deep pools, which promoted a diverse aquatic habitat due to the varying water levels. The Tilbury sludge containment wetland provides a natural habitat for plants, birds, snakes, minnows and other wildlife. It is estimated that this sludge management system saved the Municipality of Chatham-Kent approximately $2.25 million dollars, in comparison to agricultural land application.

Figure 14 - Sludge Management Alternative Capital Costs for the Tilbury Sewage Treatment Plant Upgrade



6.0 CONCLUSIONS AND RECOMMENDATIONS

The following sustainable design concepts are recommended for consideration as part of the Preliminary Design of the Grand Bend STF Expansion and Upgrade:

- Solar Photovoltaic System
    - has a high capital cost, with a pay-back period roughly equivalent to the operating life of the system
    - modular system which could be upgraded in the future, if necessary, by adding panels and potentially a battery.
- Effluent Heat Recovery System
    - energy efficient method of heating and cooling a building
    - high capital cost with a pay-back period of approximately seven years
    - reduces the heating requirement for the building.
- Blower Waste Heat Recovery
    - energy efficient method of supplementing building heating needs
- On-Site Sludge Management System
    - provides aerobic digestion of sludge on-site in an environmentally friendly manner
    - no offsite sludge disposal fees.

Figure 15 illustrates the recommended "hybrid" sustainable design concepts for the Grand Bend STF Expansion and Upgrade.

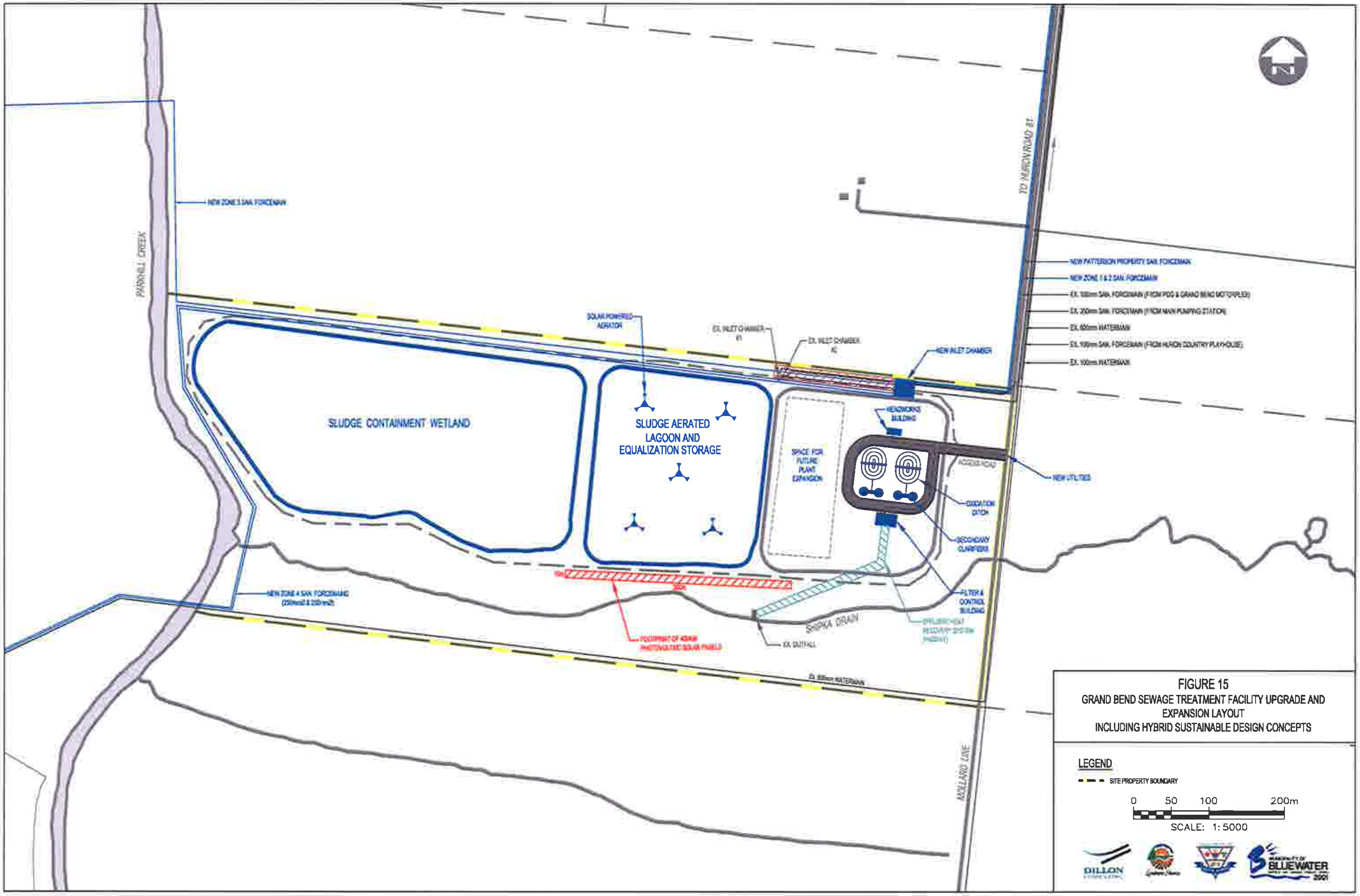


FIGURE 15
GRAND BEND SEWAGE TREATMENT FACILITY UPGRADE AND EXPANSION LAYOUT
INCLUDING HYBRID SUSTAINABLE DESIGN CONCEPTS

LEGEND

SITE PROPERTY BOUNDARY

0 50 100 200m
SCALE: 1:5000

DILLON
MUNICIPALITY OF BLUEWATER 2001

APPENDIX A
Solar Photovoltaic System – Technical Information

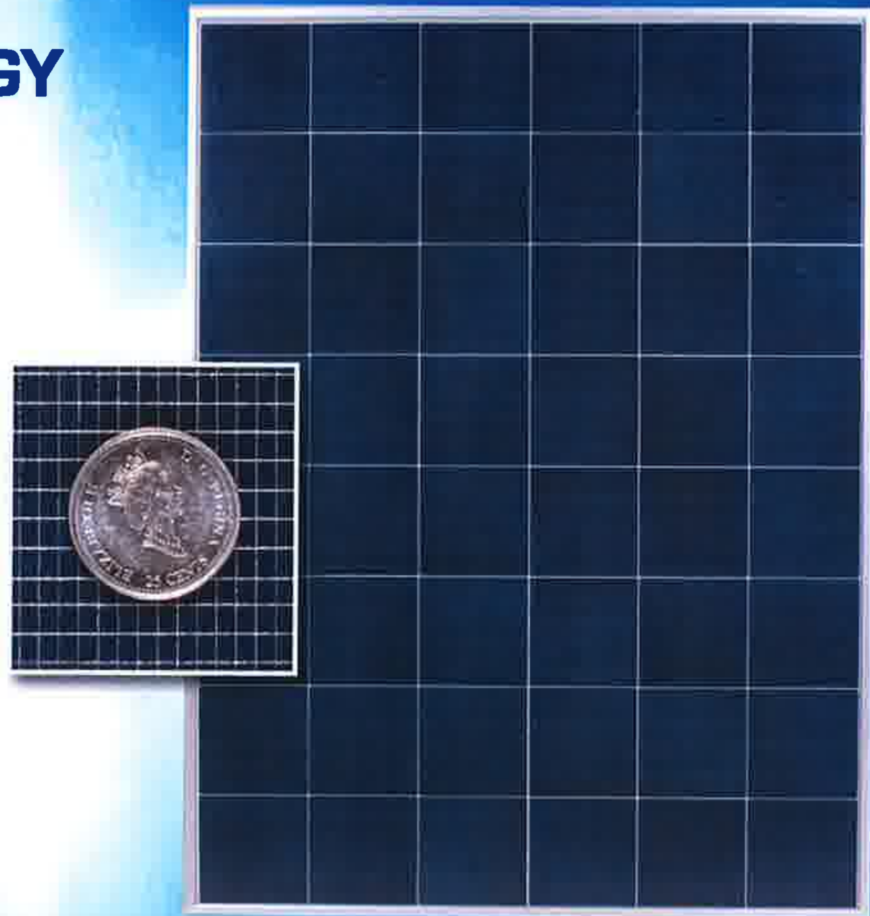
APPENDIX A – SOLAR PHOTOVOLTAIC SYSTEMS – TECHNICAL INFORMATION

When installing such a large amount of solar panels as would be required for the project, it is generally best to deal with a solar panel distributor, rather than purchasing them directly from the manufacturer. The distributor would be able to perform all of the necessary design calculations and set the solar panels up properly, based on their experience. Some of the solar distributor companies considered include:

- Glenergy
- Arise Technologies
- Ontario Electrical Construction Company Ltd.

There are many manufacturers of solar panels and each one has its advantages and disadvantages. The following brochure is an example of a solar panel product that would be appropriate for this project.

DAY4 ENERGY



DAY4 48MC

Premium Photovoltaic Modules

Features

- world's leading quality 48 custom designed and manufactured multi-crystalline PV cells
- Day4™ Electrode high efficiency cell interconnection technology
- increased electrical contact redundancy
- premium power density
- customer-driven product design
- refined appearance
- zero tolerance quality
- commitment to customer satisfaction
- strong performance in low light conditions
- module efficiency up to 14.7%
- 25 Year Power Warranty
- 5 Year Product Warranty

Benefits

- **more power from less space:** exceptional power density offers leading performance in its class and helps to boost system performance even under space constraints
- **reduced systems costs:** customer-inspired product design, fewer modules needed to complete the project, all help to reduce installation time and effort
- **no need to compromise:** sophisticated appearance and meticulous attention to details; capable of satisfying some of the highest aesthetic requirements
- **worry-free power:** designed and manufactured in Canada to exacting standards, our product offers extreme durability and premium materials. Day 4™ is committed to customer satisfaction, providing worry-free use in some of the harshest climates

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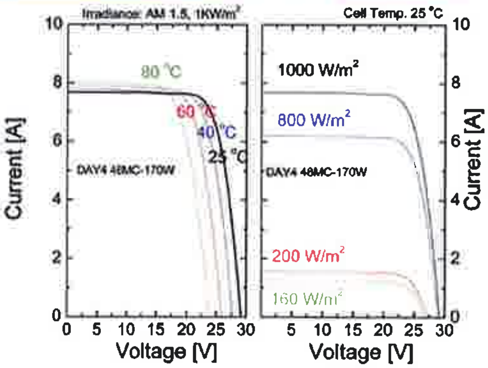

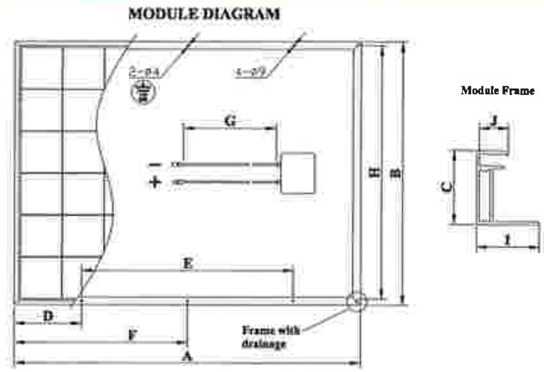

Qualification Test Parameters:

Temperature cycling range:	-40°C to +90°C (-40°F to 194°F)
Humidity freeze:	85% rH, -40°C to +85°C (-40°F to 185°F)
Static load front and back:	UL 2155 pa (45 psf)
Front loading (e.g. snow):	UL 2155 pa (45 psf)
Fire Class:	C
Corrosive atmosphere test:	pass
Protection Classification:	IP 65

Day4™ Anodized Aluminum Frame:
The unique design features: water drainage holes to reduce frame breakage due to freezing temperatures; multiple grounding holes for ease of installation; top frame surface has a beveled profile to reduce dirt and water trapping; deep glass frame slot increases strength and durability.

Mechanical Specifications:
GLASS: Solar glass (tempered)
JUNCTION BOX: Tyco Solarlok Interconnection, output cables, male and female locking cable couplers
CELLS: 48 cells Multi Crystalline Silicon 156 mm square (6+ inches)
BACK SHEET: Multi-layer water resistant film compound

Physical Specifications:

	METRIC	IMPERIAL	
A	1,307 mm	51.457 in.	
B	991 mm	39.016 in.	
C	35 mm	1.378 in.	
D	403 mm	15.867 in.	
E	501 mm	19.724 in.	
F	653.5 mm	25.728 in.	(Grounding holes on each side)
G	925 mm (±10 mm)	36.417 in.	(± 0.393 in.)
H	947 mm	37.283 in.	
I	30 mm	1.181 in.	
J	13 mm	0.512 in.	
WEIGHT:	17.4 kg approx.	38.28 lbs approx.	

2-ø4 denotes 2 holes (grounding holes) with a diameter of 4 mm
Grounding Hole
4-ø9 denotes 4 holes (mounting holes) with a diameter of 9 mm
NOTE: All dimensions are accurate within +/-1.5 mm tolerance unless otherwise stated. Product dimensions in imperial inches (conversion of 1 mm equals 0.03937 inches, 1 kg equals 2.2 lbs) are provided for information purposes only.

Typical Electrical Performance at STC (1000 W/m², AM 1.5 Spectrum, cell temperature 25°C)

Peak Power (Wp)	Watts	160	165	170	175	180	185	190
Max. Power Voltage (Vmp)	Volts	22.60	22.95	23.04	23.40	23.70	23.82	24.00
Max. Power Current (Imp)	Amps	7.08	7.19	7.38	7.48	7.60	7.77	7.92
Open Circuit Voltage (Voc)	Volts	28.30	28.6	28.80	29.20	29.40	29.51	29.70
Short Circuit Current (Isc)	Amps	7.70	7.80	7.90	8.05	8.10	8.20	8.30

Typical Electrical Performance (800 W/m², AM 1.5 Spectrum, cell temperature 25°C)

Peak Power (Wp)	Watts	160	165	170	175	180	185	190
Max. Power Voltage (Vmp)	Volts	22.46	23.02	23.39	23.58	23.84	23.71	23.89
Max. Power Current (Imp)	Amps	5.84	5.77	5.92	6.01	6.09	6.29	6.41
Open Circuit Voltage (Voc)	Volts	28.04	28.25	28.58	28.97	29.10	29.22	29.41
Short Circuit Current (Isc)	Amps	6.23	6.27	6.36	6.48	6.52	6.59	6.67

Short Circuit Temp. Coefficient	mA/K	7.80
Open Circuit Temp. Coefficient	V/K	-0.11
Max. Power Temp. Coefficient	%/K	-0.48

Module power tolerance:	+/- 3.5%
Module Maximum Fuse Series Amps:	15 A
Reduction of efficiency (from 1000 W/m² to 200 W/m²):	< 4%

Normal Operating Cell Temperature (NOCT):	46°C
Maximum System Voltage:	600V (US), 1000V (EU)

Specifications and design are subject to change without notice. The features, functions and appearance of Day4 48MC may differ from details given due to continual product development.

DAY4 ENERGY

Day4 Energy Inc.
101 - 5898 Trapp Avenue, Burnaby, BC Canada V3N 5G4
sales@day4energy.com
Tel. +604.759.3294, Fax +604.759.3295
www.day4energy.com

Day4 Systems GmbH & Co. KG
Schwarzwaldstraße 44, 76858 Zimmern o. R. Germany
info@day4.de
Tel: +49 741 175 299 0
www.day4.de

APPENDIX B

Wind Turbine System – Technical Information

APPENDIX B – WIND TURBINE SYSTEMS – TECHNICAL INFORMATION

Wind turbines involve a lot of engineering and complex installation. Each turbine is handled separately and installation requirements vary depending on the soil and wind conditions of the site. Typically wind turbine manufacturers staff the engineers who are able to provide design and installation requirements. A few different companies were considered for wind turbines.

Northern Power specializes in the manufacture of a 100 kW wind turbine: the NorthWind NW100/19. It is a highly reliable wind turbine with low maintenance. It has a thirty-year operating life and will operate at the lower wind speeds anticipated at the project site. A document with all of the technical specifications and information about this wind turbine product is included.

Northern's NorthWind 100/19 wind turbine provides cost-effective, highly reliable renewable energy in demanding environments.

www.northernpower.com

The NorthWind NW100/19™ Simplicity by Design

Designed specifically for extreme weather in remote village power and distributed generation applications, the NW100/19 is a state of the art, utility-scale wind turbine. Northern Power Systems has drawn on 25 years of experience to engineer a wind turbine that provides cost-effective, highly reliable renewable energy in demanding environments.

Designed to meet the needs of small utilities and independent power producers, the NW100/19 has the following features:

Simplicity

High reliability and low maintenance were the focus in developing the NW100/19. The design integrates industry proven robust components with innovative design features to maximize wind energy capture in severe and remote locations. The turbine features a minimum of moving parts and vulnerable subsystems to deliver high system availability. The uncomplicated rotor design allows safe, efficient turbine operation.

- Direct drive generator eliminates the drivetrain gearbox
- Dual fail-safe disk brake and electro-dynamic braking system eliminates blade brakes

Serviceability

All service activities can occur within the tubular tower or nacelle housing, providing complete protection from severe weather conditions. Designated work areas provide ample room to perform service activities.

Power Quality

The most common generator utilized in the wind industry is a gear driven asynchronous (induction) generator. Induction generators must be connected to a stable voltage source for excitation and reactive power (VAR) support. While large power grids can easily provide this support, power quality and system stability is compromised in distributed generation and village systems where the power grid is typically "soft and unbalanced."

NPS has solved this issue with the NW100/19. Our synchronous, variable speed direct drive generator

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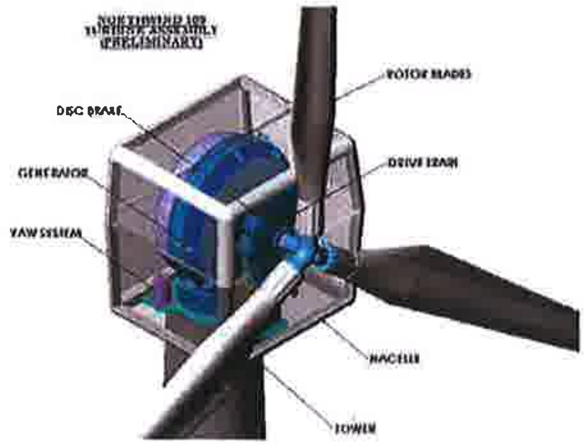
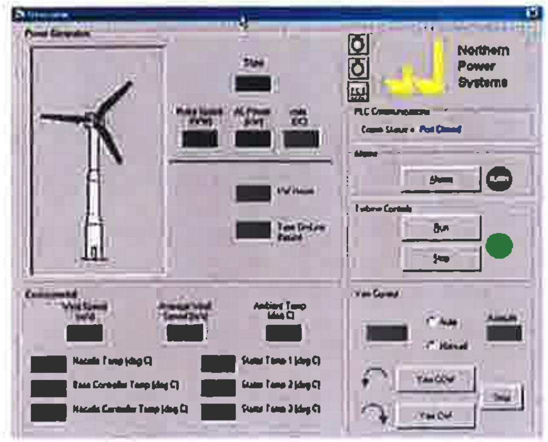




and integrated power converter increases energy capture, while eliminating current in-rush during control transitions. This turbine can be connected to large power grids and remote wind-diesel configurations without inducing surges, effectively providing grid support rather than compromising it.

System Description

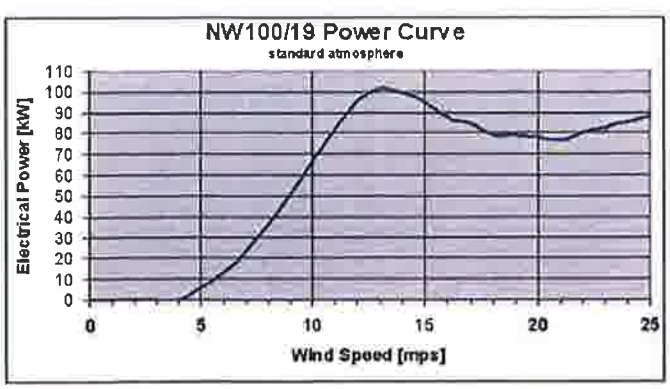
The variable speed, stall controlled turbine rotor assembly consists of three fiberglass reinforced plastic (FRP) blades bolted to a rigid hub, which mounts directly to the generator shaft. This simple, robust design eliminates the need for rotating blade tips, blade pitch systems, and speed increasing gearboxes.

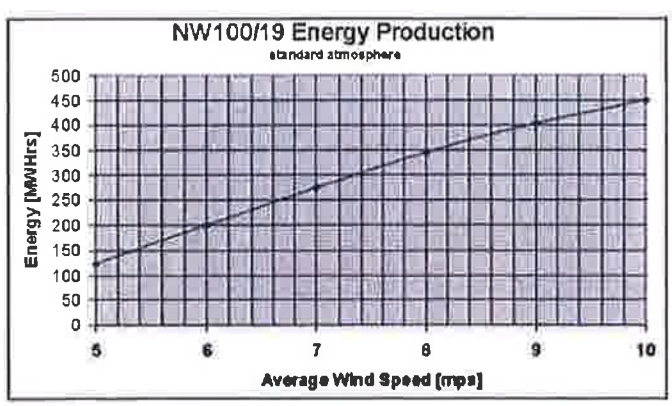
Using a state-of-the-art airfoil design increases the blade's aerodynamic efficiency and renders them insensitive to surface roughness caused by dirt build-up and insects. The advanced FRP-resin infusion molding process ensures a high-quality blade while the root connection guarantees it will meet extreme temperature requirements.

The direct drive generator is a salient pole synchronous machine designed specifically for high reliability applications. Electrical output of the generator is converted to high quality AC power that can be synchronized to conventional or weak isolated grids. The advanced power conversion system also eliminates the inrush currents and poor power factor of conventional wind turbines. The output complies with IEEE 519-1992 power quality specifications.

The variable speed direct drive generator/converter system is tuned to operate the rotor at the peak performance coefficient, and also allows stall point rotor control to contend with wide variation in air density found in the target applications.

The safety system consists of a spring applied, pressure released disk brake mounted on the generator shaft for emergency conditions, and an electrodynamic brake system that provides both normal shutdown and emergency braking backup functions.





NW100/19 Technical Specifications

Design Specifications

Turbine Class	IEC WTGS Class I
Design Life	30 year
Design Standards	In Accordance with IEC 1400-1

Performance

Nominal Power Rating	100 kW
Rated Wind Speed	13 m/s (29mph)
Cut-In Wind Speed	4 m/s (9mph)
Cut-Out Wind Speed	25 m/s (56mph)
Survival Wind Speed	70 m/s (157mph)

General Configuration

Rotation Axis	Horizontal
Orientation	Upwind
Yaw Control	Active
Number of Blades	3
Hub Type	Rigid
Drive Train	Direct Drive
Power Regulation	Stall

Rotor

Diameter	19.1 m
Swept Area	284 m2
Speed Range	45-69 RPM
Speed @ rated power	68.5 RPM
Structural Configuration	Flange Mounted Blades, Rigid Hub
Power Regulation	Variable Speed Stall
Rotor Rotation	Clockwise (Viewed from Upwind)
Pitch Angle	-0.75° @ tip, nominal
Coning	0°

Blades

Airfoil	S819, S820, S821Series
Material	Fiberglass Reinforced Plastic (FRP)
Lightning Protection	Standard Integrated System

Drive Train

Configuration	Variable Speed Direct Drive
Tilt Angle	4°
Generator Type	Salient Pole Synchronous
Insulation Class	NEMA H
Generating Speed	45-69 RPM
Generator Rating	100 kW w/ 1.15 Service Factor
Generator Output	575 VAC
Speed Control	IGBT Controller

Grid Connection

Grid Voltage	480 VAC std: 380-30kW available
Grid Frequencies	50/60 Hz

Braking Systems

Mechanical Brake	Main Shaft Disc Brake w/ Dual Spring Applied Calipers
Electro-Dynamic Brake	Parking and emergency backup

Yaw System

Type	Active Upwind
Damping system	Adjustable Friction
Yaw Drive	Electrically Driven Planetary Gearbox
Yaw Bearing	Slew Ring

Tower

Type	Tubular
Hub Height	25/30/35 m (82/98/115 ft)
Material	Steel
Corrosion Protection	Marine Paint

Service Environment

Tower	Fully Enclosed, Ladder Way
Nacelle	Fully Enclosed

Controller

Type	Northern WTGS-100 Controller, Microprocessor-based
Functions	Complete Supervisory Control and Data Acquisition
Remote Control/ Monitoring Software	Integrated SmartView™ Access
Power Electronics	IGBT Pulse Width Modulation (PWM) Converter
Power Quality	IEEE 519-1992

Environmental Specifications

Temperature Operating Range	-46°C to 50°C (-50°F to 122°F)
Lightning Protection	In Accordance with IEC 61024-1
Icing	Ice cover to 30 mm (1 in)
Seismic Loading	Zone 4

Packages available for specific site condition such as coastal environment.

Masses

Rotor	761 Kg (1 680 lbs)
Nacelle (excluding rotor)	6325 Kg (13 950 lbs)
Tower (25m)	6500 Kg (14 330 lbs)

Northern Power reserves the right to alter turbine specifications at any time.

››

Development

The NW100/19 turbine was developed by NPS with support from cooperating agencies within the U.S. government, including the National Aeronautics and Space Administration (NASA); the National Science Foundation (NSF); the Department of Energy (DOE); and the DOE-funded National Renewable Energy Laboratory (NREL). Siemens-Westinghouse acted as a subcontractor to NPS in developing the innovative direct drive generator subsystem.

Turbine certification testing is being carried out at the National Renewable Energy Laboratories National Wind Test Site at Rocky Flats, CO. This testing is near completion and will result in a Type Testing Conformity Statement, which validates the turbine safety systems and structural design. Turbine testing also includes Type Characteristic Measurements that prove the performance and acoustic signature of the turbine.

NPS wind turbines at the South Pole and the Antarctic coast have operated in more extreme conditions than any other turbines, including winds to 198 mph (88.5 m/s) and temperatures to -112°F (-80°C.) This experience gained in harsh, remote conditions has been incorporated into key NW100/19 design decisions affecting configuration, materials selection, performance characteristics, and deployment procedures.

For further information contact:

Lawrence Mott
Northern Power Systems
Waitsfield, VT 05673
(802) 496-2955 x-239
lmott@northernpower.com

Northern Power Systems designs, builds and installs ultra-reliable electric power system solutions for industrial, commercial and government customers worldwide. Since our founding in 1974, we have installed over 800 systems in 40 countries on all seven continents.

Headquarters:
Northern Power Systems
182 Mad River Park
Waitsfield, VT 05673 USA
Phone: 877-496-2955
Fax: 802-496-2953

California Office:
Northern Power Systems
33 New Montgomery Street,
Suite 1280
San Francisco, CA 94105 USA
Phone: 415-543-6110
Fax: 415-543-6105

www.northernpower.com

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NORTHERN
POWER SYSTEMS

APPENDIX C

Bio-Energy System – Technical Information

APPENDIX C – BIO-ENERGY SYSTEM – TECHNICAL INFORMATION

The bio-energy co-generation system burns the methane that is produced in the anaerobic sludge digestion process. The methane fuels a reciprocating engine which produces electricity to power the treatment plant building. The manufacturer, Caterpillar, has a reciprocating engine which would meet the design criteria. The Caterpillar engine has a rated efficiency of 42%, which will provide an output of approximately 50 kW.

There are Caterpillar engines installed in many Canadian Wastewater Treatment Plants (WWTPs) as indicated in the table below.

Table C1 - Installations of Caterpillar Reciprocating Engines in Canada (Senior et al., 2008)

Facility	Location	Start Year	Installed Capacity (kW_e)	Operating Capacity
Woodward Ave WWTP	Hamilton, ON	2006	1,600	950
R.O. Pickard	Ottawa, ON	1997	2,400	2,000
Humber STP	Toronto, ON	2005	4,700	2,000
Clarkson WPCP	Mississauga, ON	1999	810	250
Iona Island	Vancouver, BC	1999	4,100	1,800
Lethbridge STP	Lethbridge, AB	2002	1,620	810

APPENDIX D

Geothermal Systems – Technical Information

APPENDIX D – GEOTHERMAL SYSTEMS – TECHNICAL INFORMATION

There are a number of companies that install geothermal ground-source and surface water-source heat pumps, some of which include:

- Boreal Geothermal Inc
- Econar
- Northern Heat Pump.

The installation of the underground piping in a horizontal arrangement is a complex process. The soil conditions play a major factor in the design of the system.

APPENDIX E

Heat Exchanger – Technical Information

APPENDIX E – HEAT EXCHANGER – TECHNICAL INFORMATION

A heat exchanger was considered to remove heat from the treated effluent to heat the treatment plant building. There are a number of companies with heat exchanger products. The following companies were contacted for this study:

- Napier-Reid Ltd
- Directrik Ltd.
- Claro Environmental Technologies and Equipment Ltd.

Each company can provide us with a product that will meet the design criteria, but it needs to be specially designed for the application.

APPENDIX F

Solar Photovoltaic System - Strategy for System Implementation

APPENDIX F – SOLAR PHOTOVOLTAIC SYSTEM – STRATEGY FOR SYSTEM IMPLEMENTATION

A solar PV system is a modular system, which could be installed in stages by adding panels and/or batteries at various stages as the Grand Bend STF is expanded and upgraded in phases. The capacity of the solar PV system could be increased as the power demand of the treatment plant increases. The three proposed stages for the implementation of the solar PV system are outlined below:

Stage 1 (Years 1 – 10)

- 140 kW solar PV system with no battery
- it is assumed that this system would be installed in year 1.

Stage 2 (Years 11 – 15)

- an additional 40 kW of solar PV panels would be added to bring the total system load to 180 kW
- no battery for this system
- it is assumed that this system would be added/installed in year 11.

Stage 3 (Years 16 – 25)

- An additional 220 kW of solar PV panels would be added to bring the total system load up to 400 kW
- A battery providing three days of autonomy would be added to the system
- It is assumed that this system would be added/installed in year 16.

Figure F1 – Total Cost of Each Stage for the Implementation for the Solar PV System

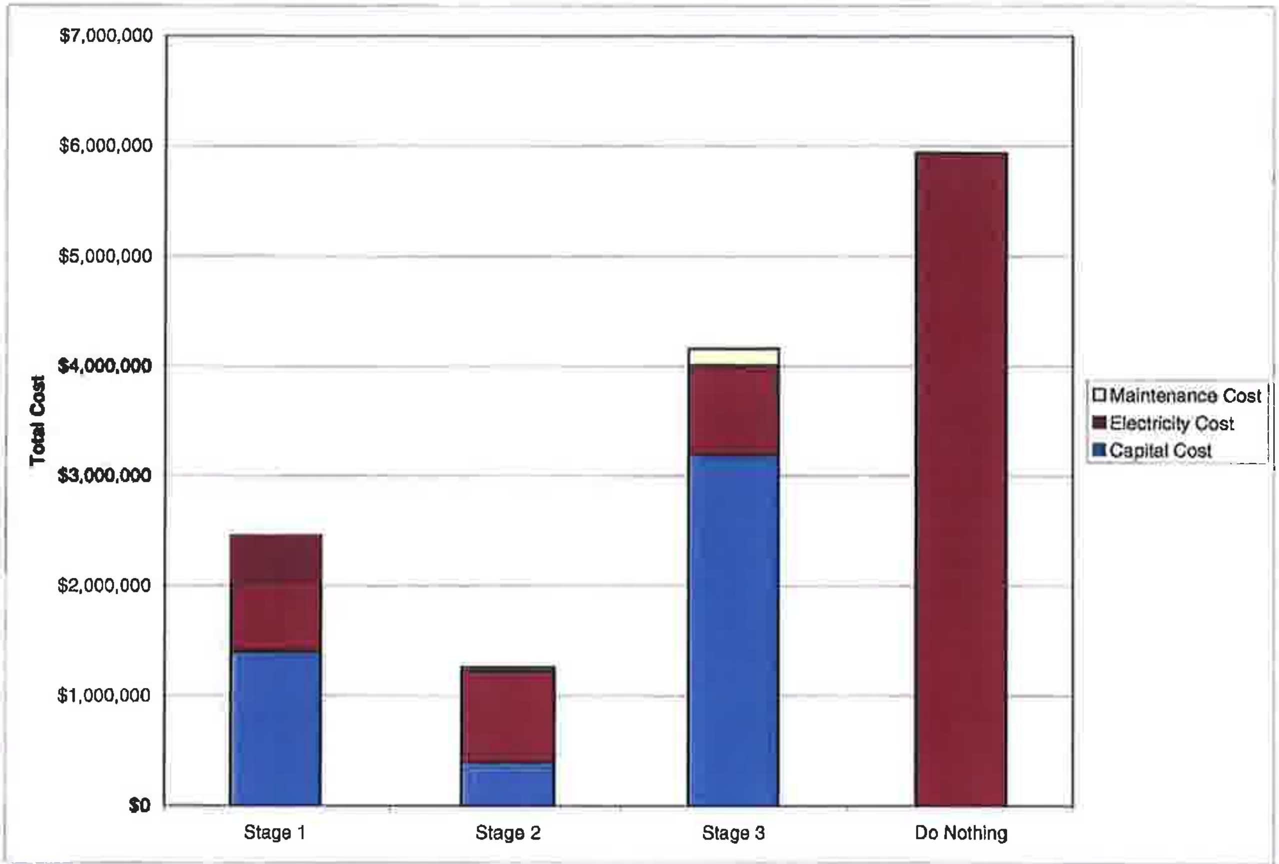

Figure F1 provides the total cost of each phase, which includes the combined estimated capital costs, maintenance costs, as well as the electricity costs associated with purchasing supplemental electricity from the grid. The "do nothing" option provides the estimated electricity costs for 25 years.

Figure F2 – Cumulative Costs for the Implementation for the Solar PV System

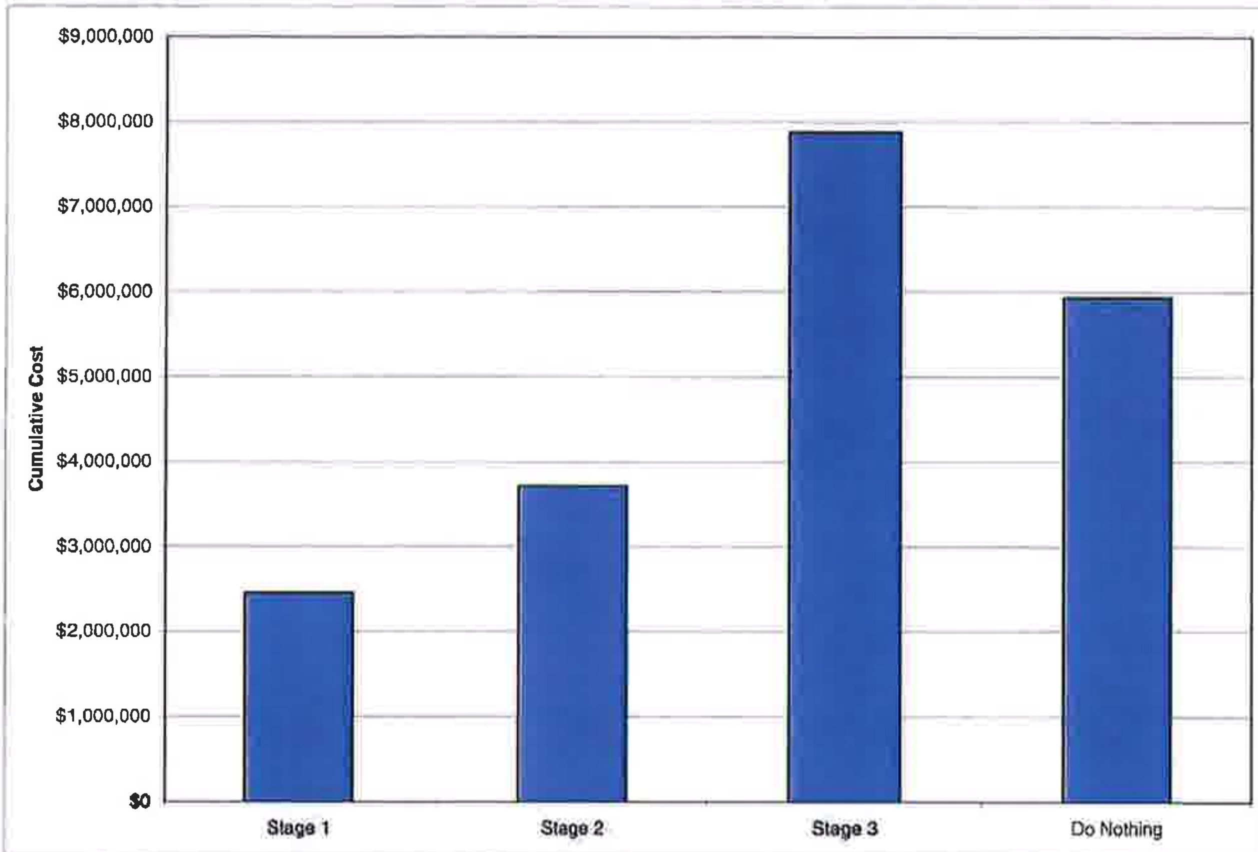

Figure F2 illustrates the estimated capital, maintenance and electricity costs cumulatively at the end of each phase. By Stage 3 (year 25), an estimated cumulative cost of $7.9M would have been invested into the solar PV system.

APPENDIX C
PUBLIC AND AGENCY CONSULTATION

GRAND BEND SEWAGE TREATMENT FACILITY (STF)
EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Project Initiation Notice

The Grand Bend and Area Sanitary Sewage Master Plan (February 2006) is a comprehensive, long-range document outlining the sanitary sewage infrastructure improvements required to service portions of the Municipalities of Lambton Shores, South Huron and Bluewater over the next 20 years, as shown on Map 1. The expansion and upgrade of the Grand Bend STF to a mechanical treatment plant was identified as the preferred solution for meeting the Service Area's immediate and future sewage treatment needs.

The location of the Grand Bend STF is shown on Map 2.

Map 1. Master Plan Study Area

Dillon Consulting Limited has been retained by Lambton Shores, in partnership with South Huron and Bluewater, to prepare a Class EA and Preliminary Design of the proposed expansion and upgrade of the Grand Bend STF.

Map 2. Grand Bend STF

As required by the "Municipal Class EA" (2007) for a Schedule "C" project, the study consists of the following major components:

- ***Phases 1 and 2 Review and Update*** will confirm the Master Plan's recommendations regarding the need to expand and upgrade the STF
- ***Phase 3 Design Options*** will identify and evaluate design options for the expansion and upgrade and recommend a preferred Preliminary Design. Phase 3 will be prepared with the input of archaeologists, terrestrial and aquatic biologists and land use and environmental planners
- during ***Phase 4***, the Class EA process will be documented in an ***Environmental Study Report (ESR)*** placed on the "public record" for a 30-day review period.

A ***Public Information Centre*** to obtain public and agency input on the recommended design option will be held during Phase 3. A subsequent notice will include the date and location of the PIC. If you have any comments, questions or concerns or would like to be added to the project Contact List, please contact:

Peggy Van Mierlo-West
Director of Community Services
9575 Port Franks Road
R.R. 1, Thedford, Ontario
N0M 2N0
Tel: 519-243-1400
Fax: 519-243-3500
E-mail: pvmwest@lambtonshores.ca

Janet Smolders, MCIP
Dillon Consulting Limited
Box 426, London, Ontario
N6A 4W7
Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

MUNICIPALITY OF LAMBTON SHORES
GRAND BEND SEWAGE TREATMENT PLANT UPGRADE
07-8597

CONTACT LIST
January 15, 2009

1. FEDERAL AGENCIES

Fisheries and Oceans Canada
73 Meg Drive
London, Ontario
N6E 2V4

Attention: Joe deLaronde
Fish Habitat Biologist

Transport Canada – Marine
100 South Front Street
Sarnia, Ontario
N7T 2M4

Tel: 519-383-1866

Attention: Suzanne Shea
NWP Officer

Transport Canada – Ontario Region
4900 York Street
North York, Ontario
M2N 6A5

Attention: Jeremy Craigs
Environmental Officer

2. PROVINCIAL MPP's, MINISTRIES AND AGENCIES

Robert Bailey, MPP
Sarnia-Lambton Constituency Office
836 Upper Canada Drive
Sarnia, Ontario
N7W 1A4

Email: bob.bailey@pc.ola.org

Maria Van Bommel, MPP
Lambton-Kent-Middlesex
Constituency Office
71-C Front Street West
Strathroy, Ontario
N7G 1X6

Email: mvanbommel.mpp.co@liberal.ola.org

Carol Mitchell, MPP
Huron-Bruce Constituency Office
322 Lambton Street
Kincardine, Ontario
N2Z 1Y9

Email: cmitchellmpp.co@liberal.ola.org

Ministry of Agriculture and Food
Field Services, South Region
667 Exeter Road
London, Ontario
N6E 1L3

Attention: Drew Crinklaw
Rural Planner

Ministry of Culture
Heritage and Libraries Branch
Southwestern Archaeological Field Office
900 Highbury Avenue
London, Ontario
N5Y 1A4

Attention: Shari Prowse
Heritage Planner/Archaeologist

Ministry of Environment
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Attention: Micheline Riopelle
Regional Director

Ministry of Environment
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Attention: Craig Newton
Environmental Planner

Ministry of Environment
Sarnia District Office
1094 London Road
Sarnia, Ontario
N7S 1P1

Attention: Mike Moroney
District Manager

Ministry of Environment
Sarnia District Office
1094 London Road
Sarnia, Ontario
N7S 1P1

Attention: Chris Hutt
Senior Environmental Officer

Ministry of Municipal Affairs and Housing
Municipal Services Office - Southwestern
659 Exeter Road, 2nd Floor
London, Ontario
N6E 1L3

Attention: Kevin McClure
Planner

Ministry of Natural Resources
Aylmer District
615 John Street North
Aylmer, Ontario
N5H 2S8

Attention: Andrea Fleischhauer
District Planner

Ministry of Natural Resources
P.O. Box 7000
300 Water Street, 6th Floor, South Tower
Peterborough, Ontario
K9J 8M5

Attention: Steve Filipowitz
Supervisor, Environmental & Design Services
Ontario Parks

Ministry of Transportation, Ontario
Southwestern Region
Planning and Design Section
659 Exeter Road
London, Ontario
N6E 1L3

Attention: John Morrisey
Regional Development Review Coordinator

Ministry of Transportation, Ontario
Operational Services – Chatham
870 Richmond Street
PO Box 910
Chatham, ON
N7M 5L3

Attention: Richard Vanderboorn
Technical Services Supervisor

Ontario Parks
Pinery Provincial Park
9526 Lakeshore Road
RR2
Grand Bend, Ontario
N0M 1T0

Attention: John Swick
Park Superintendent

3. PROVINCIAL INTEREST GROUPS

Camping in Ontario
220 Royal Crest Court
Unit 8
Markham, Ontario
L3R 9V2

Attention: Beth Potter
Executive Director

Carolinian Canada
1017 Western Road
Grosvenor Lodge
London, Ontario
N6G 1G5

Attention: Michelle Kanter
Executive Director

Ducks Unlimited
648 Lambton Line
Port Lambton, Ontario
N0P 2B0

Email: drandell@kent.net

Attention: Darrell Randell

Federation of Ontario Naturalists
355 Lesmill Road
Don Mills, Ontario
M3B 2W8

Attention: Jennifer Baker

Ontario Federation of Anglers and Hunters
P.O. Box 2800
Peterborough, Ontario
K9J 8L5

Attention: Gordon Gallant
Land Use Specialist

Tallgrass Ontario
659 Exeter Road, 4th Floor
London, Ontario
N6E 1L3

Attention: Todd Farrell

Ontario Private Campground Association
220 Royal Crest Court, Unit 8
Markham, Ontario
L3R 9Y2

Attention: Beth Potter
Executive Director

4. MUNICIPALITIES AND LOCAL AGENCIES

County of Lambton
P.O. Box 3000
Wyoming, Ontario
N0N 1T0

Attention: Glenn Millar.
Manager of Public Works

County of Lambton
Infrastructure and Development Services
P.O. Box 3000
Wyoming, Ontario
N0N 1T0

Attention: Dave Posliff, M.C.I.P.
Planning Director

Huron County Health Unit
77722B London Road
Highway 4 South, R.R. 5
Clinton, Ontario
N0M 1L0

Attention: Pam Scharfe
Public Health Manager Healthy Environment Team and Emergency Management

Corporation of the County of Huron
Planning & Development Department
1 Court House Square
Goderich, Ontario
N7A 1M2

Attention: Craig Metzger, MCIP, RPP
Senior Planner

Corporation of the County of Huron
Planning & Development Department
1 Court House Square
Goderich, Ontario
N7A 1M2

Attention: Claire Dodds, MCIP, RPP
Planner

Corporation of the County of Huron
Planning & Development Department
1 Court House Square
Goderich, Ontario
N7A 1M2

Attention: Sandra Weber
Planner

Municipality of South Huron
322 Main Street South
P.O. Box 759
Exeter, Ontario
N0M 1S6

Attention: Roy Hardy, CAO

Municipality of South Huron
322 Main Street South
P.O. Box 759
Exeter, Ontario
N0M 1S6

Attention: Don Giberson
Operations Manager, Water/Sewer

Municipality of Bluewater
P.O. Box 250
14 Mill Avenue
Zurich, Ontario
N0M 2T0

Attention: Lori Wolfe
CAO

Ausable Bayfield Conservation Authority
R.R. 3
Exeter, Ontario
N0M 1S5

Attention: Geoff Cade
Supervisor Water and Planning

Lambton Health Unit
Community Health Services Department
160 Exmouth Street
Point Edward, Ontario
N7T 7Z6

Attention: Chad Ikert, Supervisor
Environmental Health & Prevention Services

Tourism Sarnia-Lambton
556 North Christina Street
Sarnia, Ontario
N7T 5W6

5. FIRST NATIONS

Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane
R.R. 2
Forest, Ontario
N0M 1J0

Attention: Chief Elizabeth Cloud

Chippewas of Sarnia
978 Tashmoo Lane
Sarnia, Ontario
N7T 7H5

Attention: Chief Chris Plain

Walpole Island Heritage Centre
R.R. 3
Wallaceburg, Ontario
N8A 4K9

Attention: Chief Joseph Gilbert

Southern First Nations Secretariat
22361 Austin Line
Bothwell, Ontario
N0P 1C0

6. UTILITIES

Lake Huron & Elgin Area Primary Water Supply Systems
29 Kilworth Park Drive
R.R. 5
Komoka, Ontario
N0L 1R0

Attention: Andrew Henry
Division Manager, Regional Water Supply

Hay Communications Co-operative Limited
P.O. Box 99
Zurich, Ontario
N0M 2T0

Attention: Ken Clarke

Hydro One Networking
483 Bay Street, 13^{th} Floor, North Tower
Toronto, Ontario
M5G 2P5

Attention: Brian J. McCormick, P. Eng.
Manager, Environmental Services and Approvals Department

Operations Management International (OMI)
7550 Brush Road
P.O. Box 659
Forest, Ontario
N0N 1J0

Attention: Terry Rands

Union Gas Limited
P.O. Box 553 Station A
London, Ontario
N6A 4P1

Attention: Brian Roberts
Distribution Systems Development

7. LOCAL INTEREST GROUPS, RATEPAYERS ASSOCIATIONS, DEVELOPERS AND TRAILER PARKS

Beach O' Pines Association
P.O. Box 12
Grand Bend, Ontario
N0M 1T0

Birch Bark Trailer Park
RR1
Dashwood, Ontario
N0M 1N0

Attention: Randy Glazier

Tel: 519-238-8256

Bluewater Shoreline Residents' Association
GMB 411, RR2
Zurich, ON
N0M 2T0

Attention: Jan Purvis
President

Carolinian Forest Family Campground
c/o Fred & Sandra Funk
9589 Ipperwash Road
R.R #2
Forest, Ontario
N0N 1J0

Friends of Pinery Park
Pinery Park Visitor Centre
9526 Lakeshore Road
R.R. 2
Grand Bend, Ontario
N0M 1T0

Grand Bend Area Chamber of Commerce
P.O. Box 248,
1-81 Crescent Street
Grand Bend, Ontario
N0M 1T0

Attention: Christine Bregman
Office Manager

Grand Bend Lioness Club
P.O. Box 1281
Grand Bend, Ontario
N0M 1T0

Attention: Virginia Scott

Grand Cove Estates
P.O. Box 217
Grand Bend, Ontario
N0M 1T0

Attention: Sharon VanHeval

Greater Grand Bend Community Association
P.O. Box 671
Grand Bend, Ontario
N0M 1T0

Attention: Stephanie Donaldson
President

Green Haven Trailer Park
52 Ontario Street North
Grand Bend, Ontario
N0M 1T0

Attention: Steven Baird

Tel: 519-238-7275

Huron Woods Community Association
Box 45, R.R. 2
Grand Bend, Ontario
N0M 1T0

Attention: Board of Directors

Klondyke Trailer Park
9921 Lakeshore Road
R.R. 2
Grand Bend, Ontario
N0M 1T0

Attention: Bernie Kelders

Lambton Area Builders Exchange
373 Vidal Street S
Sarnia, Ontario
N7T 2V3

Lambton Wildlife Inc.
Box 681
Sarnia, Ontario
N7T 7J7

Maple Grove Syndicate Ltd.
c/o McLean & Kerr LLP
Suite 2800, 130 Adelaide Street W
Toronto, Ontario
M5H 3P5

Attention: Jim Fraser

McIlwraith Field Naturalists
1625 Hillside Drive
London, Ontario
N6G 2R1

Attention: J. W. Lorimer
Conservation Chair

McIlwraith Field Naturalists
89 Greyrock Crescent
London, Ontario
N5Y 6L4

Attention: Don Perrie
Conservation Coordinator

Merrywood Inc.
R.R. 2
Grand Bend, Ontario
N0M 1T0

Attention: Peter Warner

Optimist Club of Grand Bend
P.O. Box 822
Grand Bend, Ontario
N0M 1T0

Pinedale Home Owners Association
9839 Lake Shore Road E.
P.O. Box 45, Pinedale Road
R.R. 2
Grand Bend, Ontario
N0M 1T0

Attention: Albert Bell
President

1131 Group
379 Queen Street South
Kitchener, Ontario
N2G 1W6

Attention: Scott Lamb

Rice Development Company Inc.
17 Dean Street
Brampton, Ontario
L6W 1M7

Attention: Roger Howard

Royal Canadian Legion Branch 498
P.O. Box 429
Grand Bend, Ontario
N0M 1T0

Rus-Ton Family Campground
9787 Lakeshore Road
R.R. 2
Grand Bend, Ontario
N0M 1T0

Southcott Pines Park Association
P.O. Box 144
Grand Bend, Ontario
N0M 1T0

Attention: Richard Frayne
President

Southwinds Development Company Inc.
9952 Glendon Drive
Komoka, Ontario
N0L 1R0

Tru Land Developments Inc.
Wintru Developments Inc.
100-4747 Pleasant Place
Windsor, Ontario
N8Y 5B4

Attention: Sandra TeJada
Planning & Development
Project Coordinator

Turnbull's Grove
RR2
Dashwood, Ontario
N0M 1N0

Attention: Dave Bruder

Tel: 519-657-5218

VanDongen Ratepayers Association
P.O. Box 10
VanDongen Subdivision
R.R. 2
Grand Bend, Ontario
N0M 1T0

Attention: Frank Delitala

8. RESIDENTS

Names not included to comply with the *Freedom of Information and Protection of Privacy Act.*

9. SURROUNDING PROPERTY OWNERS

Names not included to comply with the *Freedom of Information and Protection of Privacy Act.*

Schultz, Emily

From:	Smolders, Janet
Sent:	Tuesday, April 08, 2008 9:20 AM
To:	Schultz, Emily
Subject:	FW: Class EA - Grand Bend Sewage Treatment Facility (STF) Expansion and Upgrade NEATS 12252
Attachments:	Annex A Navigable Waters Protection Act Application Addresses.doc; TC Application Form.pdf; TC Application Guide.pdf

Annex A Navigable Waters Prote... TC Application Form.pdf (177 K... TC Application Guide.pdf (645 ...

-----Original Message-----
From: Craigs, Jeremy [mailto:CRAIGSJ@tc.gc.ca]
Sent: Tuesday, April 08, 2008 9:09 AM
To: pvmwest@lambtonshores.ca; Smolders, Janet
Subject: Class EA - Grand Bend Sewage Treatment Facility (STF) Expansion and Upgrade NEATS 12252

Thank you for your letter regarding the above referenced environmental assessment.

We have reviewed the information, and note the following:

Transport Canada is responsible for the administration of the Navigable Waters Protection Act, which prohibits the construction or placement of any "works" in navigable waters without first obtaining approval. If any of the related project elements or activities may cross or affect a potentially navigable waterway, you are requested to prepare and submit an application in accordance with the requirements as outlined in the attached Application Guide. Any questions about the NWPA application process should be directed to Suzanne Shea, NWP Officer at (519) 383-1866.

Please note that certain approvals under the Navigable Waters Protection Act or Railway Safety Act trigger the requirement for a federal environmental assessment under the Canadian Environmental Assessment Act. You may therefore wish to consider incorporating CEAA requirements into your provincial environmental assessment.

<<Annex A Navigable Waters Protection Act Application Addresses.doc>> <<TC Application Form.pdf>> <<TC Application Guide.pdf>> Please contact me should you wish to discuss this further.

Regards,
Jeremy Craigs
Environmental Officer
Environment and Engineering
Transport Canada - Ontario Region (PHE)
4900 Yonge Street, North York, ON M2N 6A5
p: 416-952-0502
f: 416-952-0514
P Please consider the environment before printing this email.

Lambton Shores MUNICIPALITY OF SOUTH HURON MUNICIPALITY OF BLUEWATER 2001

RECEIVED
MAR 14 2008
DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

Steve Filipowitz, P. Eng.
300 Water Street, 6th floor South Tower
Peterborough, ON K9J 3C7

Phone: 705-755-1706

E-mail: steve.filipowitz@ontario.ca

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Ministry of Transportation

Engineering Office
Corridor Management Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4598
Facsimile: (519) 873-4228

Ministère des Transports

Bureau du génie
Section de gestion des couloirs routiers
Région de l'Ouest

659, chemin Exeter
London (Ontario) N6E 1L3
Téléphone: (519) 873-4598
Télécopieur: (519) 873-4228

Ontario

RECEIVED
NOV 1 8 2008
DILLON, LONDON

November 14, 2008

Janet Smolders, MCIP
Land Use and Environment Planner
Dillion Consulting Ltd.
Box 426
London, ON
N6A 4W7

RE: Project Initiation Notice
Grand Bend Sewage Treatment facility expansion and upgrade (EA & PD)
Submission No.: ESA GRAND BEND
County of Huron – Highway 21
Municipality of South Huron, Lambton Shores, Municipality of Bluewater

---

The Ministry of transportation (MTO) is in receipt of a *Project Initiation Notice* for the Grand Bend sewage treatment facility expansion and upgrade, class EA and preliminary design.

As the study area includes a portion of Highway 21, we would like to be kept informed regarding the project. Construction activities adjacent to and/or within the highway right-of-way are subject to MTO review and approval prior to construction. Permits will be required for any construction within MTO's permit control area. Feel free to contact Sylvie Lauzon, Corridor Management Officier at 519-873-4206 to discuss MTO's permit requirements.

Should you have any questions, please contact our office.

Krista O'Shea

Krista O'Shea
For
Ian Smyth
Corridor Management Planner
Corridor Management Section
West Region, London

c. Sylvie Lauzon, CMO - Corridor Management Section

Schultz, Emily

From: Smolders, Janet
Sent: Thursday, March 27, 2008 11:06 AM
To: Schultz, Emily
Subject: FW: Grand Bend Sewage Treatment Facility Expansion & Upgrade

Please make sure these are on the Contact List. Thanks, J.

From: Sandi Strang [mailto:s.strang@town.southhuron.on.ca]
Sent: Thursday, March 27, 2008 11:03 AM
To: pvmwest@lambtonshores.ca; Smolders, Janet
Subject: Grand Bend Sewage Treatment Facility Expansion & Upgrade

Please add the Municipality of South Huron to your project Contact List and direct mail to:

Roy Hardy, C.A.O.
Municipality of South Huron
P.O. Box 759
322 Main St. S.
Exeter, Ontario N0M 1S6

Thank you very much.

Sandra Strang, Clerk
Municipality of South Huron
322 Main St. S., P.O. Box 759
Exeter, Ontario N0M 1S6

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

**GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN**

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

DON GIBERSON

MUNICIPALITY OF SOUTH HURON

P.O. BOX 759 EXETER ON N0M 1S6

Phone: (519) 235-0310 ext. 226

E-mail: d.giberson@town.southhuron.on.ca

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

03/13/2008 07:58 IFAX • London RegionFAX 001/001
03-13-'08 08:56 FROM-County of Huron 5195245677 T-816 P001/001 F-133

Lambton Shores
Municipality of South Huron 2001
Municipality of BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Claire Dodds, Planner, Huron County Planning Dept.
1 Courthouse Square, Goderich, ON. N7A 1M2

Phone: 519-524-8394 x 249

E-mail: cdodds@huroncounty.ca

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Corporation of the
COUNTY OF HURON
Craig Metzger, MCIP, RPP
Senior Planner
Planning & Development Dept.
1 Court House Square,
Goderich, Ontario N7A 1M2
Tel.: 519-524-8394 ext.3
Fax: 519-524-5677
Email: cmetzger@huroncounty.ca
Website: www.huroncounty.ca

project.

Comments/Questions/Concerns:

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores | Municipality of South Huron | Municipality of BLUEWATER 2001

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MAR 11 2008
DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☐ I/we would like to be kept informed regarding this project. The contact name and address is:

Donald W. Plotch, P.Eng.
County Engineer
Huron County, 1 Court House Square, Goderich, Ont.
N7A 1M2

Phone: (519) 524-8394 (x 241)

E-mail: dplotch@huroncounty.ca

☒ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

No impact on Huron County Highway System.

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

JMS

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
BAYFIELD · HAY · HENSALL · STANLEY · ZURICH
2001

RECEIVED
MAR 0 7 2008
DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

COMMUNITY HEALTH SERVICES DEPARTMENT
Environmental Health & Prevention Services
160 Exmouth Street
Point Edward, ON N7T 7Z8

Phone: 519-383-8331 ext. 3544

E-mail: mike.gagniepy@county-lambton.on.ca

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Monday, March 10, 2008 1:46 PM
To: Schultz, Emily
Subject: FW: Project Initiation Notice

From: Henry, Andrew [mailto:AHenry@london.ca]
Sent: Monday, March 10, 2008 10:52 AM
To: Smolders, Janet
Cc: pvmwest@lambtonshores.ca
Subject: Project Initiation Notice

Re: Grand Bend Sewage Treatment Facility Expansion & Upgrade
Class Environmental Assessment and Preliminary Design

Good morning Janet,

I am in receipt of the Project Initiation Notice for the above noted Class Environmental Assessment.

On behalf of the Lake Huron Primary Water Supply System, I would like to be kept informed regarding this project and any associated initiatives relating to the potential sanitary sewage servicing to the Lake Huron Water Treatment Plant located at 71155 Bluewater Highway at Huron County Road 83 (Dashwood Road).

Best regards,

Andrew J. Henry, P.Eng.
Division Manager, Regional Water Supply
Lake Huron & Elgin Area Water Supply Systems
29 Kilworth Park Drive, RR5
Komoka, Ontario N0L 1R0
T: 519.661.2500 x2714
T: 519.661.2500 x1355 (Direct)
F: 519.474.0451
E: ahenry@london.ca
www.watersupply.london.ca

Lambton Shores · Municipality of South Huron · Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Christine Bregman, Grand Bend & Area Chamber of Commerce
PO Box 248, Grand Bend N0M 1T0

Phone: 519-238-2001

E-mail: cbregman@grandbendtourism.com

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

JMS

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

RECEIVED
MAR 12 2008
DILLON LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☐ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: ______________________________

E-mail: ______________________________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please send all correspondece to property owners from now on.

Country Side Group Investments
31150 Northwestern Hwy., Suite 100
Farmington Hills Mi 48334
USA

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☐ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: ______________________________

E-mail: ______________________________

☑ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Grand Bend Women's Institute
R.R. 3
Parkhill, Ontario
N0M 2K0

Attention: Donna Love

____

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Thursday, March 13, 2008 11:02 AM
To: Schultz, Emily
Subject: FW: Grand Bend Sewage Treatment Facility Expansion and Upgrade

---

From: LABE [mailto:info@labe.ca]
Sent: Thursday, March 13, 2008 10:47 AM
To: Smolders, Janet
Subject: Grand Bend Sewage Treatment Facility Expansion and Upgrade

Good Morning Janet,

I am just inquiring about the expansion and upgrade that we saw in the Lambton Shores Newsletter. I realize that it is in the early stages but wondering if you could possibly keep us in mind for the tender package when it is ready. We have dealt with Dillon numerous times on tenders and appreciate you sending packages to us that you feel would be of interest to our members. You do have our mailing address on file but we can also send our courier company to pick up when available. Please do not hesitate to contact the office if you have any questions or concerns. Thank you and have a nice day.

L.A.B.E. Office Staff
LAMBTON AREA BUILDERS EXCHANGE
373 Vidal St. South
Sarnia, ON. N7T 2V3
Tel: 519-332-5223
Fax: 519-332-0619
Email: info@labe.ca
Website: www.labe.ca

RECEIVED
APR 0 1 200[illegible]
DILLON, LONDON

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

DON PERRIE
CONSERVATION COORDINATOR
MCILWRAITH FIELD NATURALISTS
89 GREYROCK CRES
LONDON, ON
N5Y 6L4

Phone: (519) 451-3687

E-mail: don.perrie@sympatico.ca

☐ ~~I/we do not wish to be kept informed of this project.~~

Comments/Questions/Concerns:

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores | Municipality of South Huron | Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

ROGER HOWARD C/O RICE DEVELOPMENT

17 DEAN STREET

BRAMPTON, ONTARIO L6W 1M7

Phone: 905·796·3630

E-mail: roger@ricedevelopment

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

03/08/2008 14 05 IFAX * London RegionFAX @001/001

FROM : SOUTHCOTT PINES PARK ASSOC. PHONE NO. : 519 238 8034 Mar. 06 2008 02:04PM P1

Lambton Shores — Municipality of South Huron — Municipality of BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Southcott Pines Park Association
Box 44, Grand Bend, ON N0M 1T0

Phone: 519-238-8755

E-mail: spp2@hay.net

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Tuesday, March 18, 2008 10:39 AM
To: Schultz, Emily
Subject: Grand Bend STF Replies
Follow Up Flag: Follow up
Flag Status: Green

Hi E. I also received phone calls from:
- .. He wanted to know when the STF would be built (2012)
- ., wants to be kept on mailing list
- Hay Communications, Eric, 519-236-4333, fax back comment form? Yes.
Janet

Janet M. Smolders, MCIP
Land Use and Environmental Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
Box 426, London, Ontario
N6A 4W7
519-438-6192, Ext. 1268
jsmolders@dillon.ca

Schultz, Emily

From: Smolders, Janet
Sent: Monday, March 17, 2008 10:56 AM
To: Schultz, Emily
Subject: FW: Information

From:
Sent: Monday, March 17, 2008 9:53 AM
To: Smolders, Janet
Subject: Information

Janet Smolders,
I would like to continue to be informed about the expansion & upgrade of the sewage treatment facility of Grand Bend.
Thank you for the notices to date. I would be happy to recieve them in the mail or by email. Thanks.

RR2, Grand Bend, Ont.
N0M 1T0

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
BAYFIELD · HAY · HENSALL · STANLEY · ZURICH
2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

APP. TIME YEAR AND MONTH

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Wednesday, March 12, 2008 3:38 PM
To: Schultz, Emily
Subject: FW:

From:
Sent: Wednesday, March 12, 2008 2:19 PM
To: Smolders, Janet
Subject:

Please take us off your mailing list regarding Grand Bend Sewage Treatment, we sold our property on last fall

Thanks

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
2001

RECEIVED
MAR 27 2008
DILLON LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

PLEASE TAKE
OFF YOUR MAILING LIST
HE IS DECEASED AND I HAVE ASSUMED
PROPERTY IN, GRAND BEND
AND I ALSO HAVE A PROPERTY IN

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

✓ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Cost to hookup to Sewers & ongoing costs.

Time in which the project will be completed.

i.e. do you keep a septic tank going for a few years?

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

File No. 07-8597

DILLON CONSULTING

1-519-672-8209

Municipality of South Huron — Lambton Shores — Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: _______________________

E-mail: _______________________

☐ I/we do not wish to be kept informed of this project.

MAR 7/08

Comments/Questions/Concerns:

- HAVE WE APPLIED FOR GRANT $?
- WHEN CAN THIS BE DONE, IF NOT DONE NOW?
- WHAT IS PROJECTED TIMING FOR BLUEWATER?
- IS THERE ANYTHING THAT THE "PUBLIC" CAN DO TO GET THESE SERVICES FASTER?
- DO YOU HAVE FULL BACKING ~~F~~ FROM MUNICIPALITIES?

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Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

This project is of major importance to my financial future.
IE Sewage Costs - Hook Up Fees
Taxes etc.
My home is only 6 yrs. old.

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File No. 07-8597

DILLON CONSULTING

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

For the sake of our environment and the region's homeowners, sanitary sewage infrastructure improvements would be a positive and necessary move.

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Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores | Municipality of South Huron | Municipality of BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

X I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

(1) How Do I Vote Against This?.
(2) Why This Area.
(3) This Should Be A Grand Bend Only
(4) We Are Involved To Ease The Big! Big! Burden - Tax - Cost -
(5) Time Frame That Affects - Be Deer Run Subdivision
Thks You

Please return this form by **April 4, 2008** to:

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Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

I appreciate this information

Thanks

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Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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____

____

____

Phone: _______________

E-mail: _______________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

When is it anticipated that sewers will be installed on Defore Drive?

What will be the cost to homeowner?

Will hookups be mandatory?

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File No. 07-8597

Lambton Shores | MUNICIPALITY OF SOUTH HURON | MUNICIPALITY OF BLUEWATER 2001

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☑ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: ______________________

E-mail: ______________________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

We have a cottage on the lake in Highlands I. This issue concerns/interests us.

Thank you.

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File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

THE SOONER THE BETTER

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N6A 4W7

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Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From:	Smolders, Janet
Sent:	Thursday, March 13, 2008 9:15 AM
To:	Schultz, Emily
Subject:	FW: Grand Bend Sewage Treatment Facility

From:
Sent: Thursday, March 13, 2008 6:59 AM
To: Smolders, Janet
Subject: Grand Bend Sewage Treatment Facility
Importance: High

Good Morning,

Regarding the Grand Bend SewageTreatment Facility Expansion and Upgrade, please keep me informed of all happenings with this project as my propoerty is within the effected area as indicated on the master plan study area.

Thanks,

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

In view of the proposed extension of municipal services into existing septic tank areas, do you forsee easier approvals for new septic systems / holding tanks to fill the time gap until the new systems are installed?
I realize this is not your area, just asking for an opinion

Please return this form by **April 4, 2008** to:

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Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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- ☒ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

- ☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

We believe it is important to everyone!

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I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☑ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

WE CURRENTLY HAVE OUR OWN WASTE WATER TREATMENT FOR OUR BUSINESS. I WOULD LIKE TO BE INFORMED OF DEVELOPMENTS AS IT WOULD PERTAIN TO MY RESIDENT.

Please return this form by **April 4, 2008** to:

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Land Use and Environmental Planner

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File No. 07-8597

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

Lambton Shores

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Let's move forward as soon as possible.

Please return this form by **April 4, 2008** to:

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N6A 4W7

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Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Monday, March 10, 2008 9:35 AM
To: Schultz, Emily
Subject: FW: Grand Bend STF

From:
Sent: Friday, March 07, 2008 7:54 AM
To: Smolders, Janet
Subject: Grand Bend STF

RE: Grand Bend STF Expanson and Upgrade

We have received the "Project Initiation Notice" by mail.

I believe we are already on the project Contact List, however, if we aren't, we would like to be added.

Thanks

Grand Bend ON N0M 1T0

Lambton Shores MUNICIPALITY OF SOUTH HURON MUNICIPALITY OF BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: ______________________________

E-mail: ______________________________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

THANK YOU FOR THE UPDATES!

____

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores · Municipality of South Huron · Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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☒ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

For the sake of our lakes proceed as fast as possible

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File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
BAYFIELD · HAY · HENSALL · STANLEY · ZURICH
2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Note: any Idea of cost to the Resident when does to the city plan to go ahead with the project

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File No. 07-8597

Lambton Shores | Municipality of South Huron | Municipality of Bluewater 2001

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CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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☐ I/we would like to be kept informed regarding this project. The contact name and address is:

Please note address chg. –

Phone: —

E-mail: —

☑ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

We are interested to know the progress + time before it will be in our area

Thank You

Please note my address: We had to add our 911 # & there is no box #

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File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
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☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone: Thank you for keeping me up to date.

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Properly maintained residential septic systems do not pollute! Check the livestock farms.
I hope Grand Bend is paying for all of this.
The Sewage Treatment Plant is on the river!
It will have the opportunity to pollute the river and directly into the lake!

Please return this form by **April 4, 2008** to:

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File No. 07-8597

Lambton Shores

Municipality of South Huron

Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Klondyke Trailer Park

9921 Lakeshore Rd. RR#2

Grand Bend, ON N0M 1T0

Phone: (519) 238-8348

E-mail: klondyke@hay.net

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Our main concern is the cost to hook up to the sewer line which ~~we~~ will reflect the cost to each of our customers & will hurt our busness to be competitive with other parks in the area.

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File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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X I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

I have property in this area and will be building in next 5-10 yrs or sooner And am very curious about this Project.

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

SORRY I AM LATE WITH THIS
IS THERE A TIME LINE FOR THE VARIOUS
PHASES OF THE PROJECT?
WHEN SPECIFICALLY WILL SEWER SERVICE
BE AVAILABLE ON HWY 21 AT ST JOSEPH'S?

Please return this form by **April 4, 2008** to:

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File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

MAIN CONCERN IS MY LIFE QUALITY. AS MY PROPERTY IS VERY CLOSE TO SITE.! THERE WILL BE MANY CONCERNS & QUESTIONS IN THIS PROJECT.

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DILLON CONSULTING

File No. 07-8597

Lambton Shores | Municipality of South Huron | Municipality of BLUEWATER Bayfield - Hay - Hensall - Stanley - Zurich 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

environmental impact - air quality?

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File No. 07-8597

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Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

HAVE NOT RECEIVED NOTICE RE SEWER TO

Please return this form by **April 4, 2008** to:

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N6A 4W7

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Fax: 519-672-8209
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DILLON CONSULTING

File No. 07-8597

BELLY JOHN MERLO-WEST

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

~~E-mail:~~

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

I think a lot of people have concerns regarding the procedure and cost of the (PDC) private drain connections. A lot of dwellings, having no basements, will have to be serviced from the back of the house where septic tanks are located. Also, timing is an essential thing!

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Tuesday, March 11, 2008 11:33 AM
To: Schultz, Emily
Subject: FW: GRAND BEND SEWAGE TREATMENT FACILITY (STF)

From: Connie Garrison [mailto:cgarrison@lambtonshores.ca]
Sent: Tuesday, March 11, 2008 10:20 AM
To: Smolders, Janet
Cc: 'Peggy Van Mierlo-West'
Subject: GRAND BEND SEWAGE TREATMENT FACILITY (STF)

Please add this property owner to the project contact list:

Thanks
Connie

The Municipality of Lambton Shores

Connie Garrison
Community Services
Administrative Assistant
Northville Sub-Office
9575 Port Franks Road
RR #1
Thedford , Ontario , N0M 2N0
email address cgarrison@lambtonshores.ca
Phone 519-243-1400 / 1-866-943-1400
Fax 519-243-3500

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

RECEIVED
MAR 27 2008
DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited:

☑ I/we would like to be kept informed regarding this project. The ...

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

I AM A STRONG SUPPORTER OF THE PROJECT – FOR BLUEWATER.
I FEAR THAT NON-PROGRESSIVE PEOPLE IN THE BLUEWATER COUNCIL WILL NOT REPRESENT OUR VIEWPOINT VERY WELL.

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

File No. 07-8597

DILLON CONSULTING

Schultz, Emily

From: Smolders, Janet
Sent: Tuesday, March 11, 2008 10:22 AM
To: Schultz, Emily
Subject: FW: Grand Bend STF expansion & upgrade, EA and preliminary design

-----Original Message-----
From:
Sent: Monday, March 10, 2008 3:03 PM
To: Smolders, Janet
Subject: Grand Bend STF expansion & upgrade, EA and preliminary design

I would like to be kept informed regarding this project. I am building a new house now. I don't want to put in a new septic system if the sewer line will be here in the future. Is there an expected completion date yet?

Schultz, Emily

From: Smolders, Janet
Sent: Tuesday, March 18, 2008 2:08 PM
To: Schultz, Emily
Subject: FW: Grand Bend STF Expansion & Upgrade

From:
Sent: Tuesday, March 18, 2008 1:01 PM
To: Smolders, Janet
Subject: Grand Bend STF Expansion & Upgrade

Hi Janet

I have a continuing interest to be kept informed on this project.

Thank you,

Schultz, Emily

From:	Smolders, Janet
Sent:	Tuesday, March 25, 2008 1:28 PM
To:	Schultz, Emily
Subject:	FW: Grand Bend STF Project

From:
Sent: Sunday, March 23, 2008 4:20 PM
To: Smolders, Janet
Subject: Grand Bend STF Project

Hi Janet:

Would you please mail a hard copy of Phase 1 and Phase 2 to the address below ? I am new to the area, and would like to bring myself up to speed on this project.
Would you also place my name on your Project contact list as well ? My e-mail is

Thanks,

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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MAR 14 2008
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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:
[illegible]

Phone: ____________

E-mail: ____________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

How much will this affect our cottage? I noticed St Joseph Shores is on the fringe of the expansion (map)

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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MAR 14 2008
DILLON LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

X I/we would like to be kept informed regarding this project. The contact name and address is:

Please NOTE change of address - No longer at

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

The sooner the sewer project proceeds the bettter!

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

MY MAIN CONCERN IS THE EXTENDED AND AMPLIFIED INTRUSION AND TRANSMISSION CHALLENGES IN THE EXTENSION TO ST. JOSEPH

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores   MUNICIPALITY OF SOUTH HURON   MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☐ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

We do not approve of this Project now.
as we will be away this month

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores — Municipality of South Huron — Municipality of Bluewater 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☐ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: ______________________________

E-mail: ______________________________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

WE HAVE A COTTAGE IN NORMAN HEIGHTS / BLUEWATER

WE ARE ALSO CONCERNED WITH STORM SEWERS.
(DRAINAGE)

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
BAYFIELD - HAY - HENSALL - STANLEY - ZURICH
2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☐ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

I realize progress can not be stopped
This project is not needed in our small
village as we are on a gravel ridge with
good drainage
It will cause a lot of hardship for most
residents

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
BAYFIELD · HAY · HENSALL · STANLEY · ZURICH
2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

We have a cottage in Norman Heights and definitely need the new sewage system.

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores | Municipality of South Huron | Municipality of Bluewater 2001

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GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

~~F~~ We moved from Southcott Pines 10261 Pines Parkway. We lived there for 20 years. The newer smaller house is what we wanted. I notice by your letter that we are more closer to Grand Bend Sewage Treatment Plant. Is there any noticeable smells coming from the plant.

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores
MUNICIPALITY OF SOUTH HURON
MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

~~I/we would like to be kept informed regarding this project. The contact name and address is:~~

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

THE COST TO EACH RESIDENCE PROJECTED $25,000 IS OUTRAGEOUS – WE DID IT IN THE STATES AND IT WAS $1,500 PER HOUSE.

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
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N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone:

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

- ALWAYS A COST CONCERN FOR COTTAGE - HOOKUP COST?
SUBDIVISION & INDIVIDUAL OWNERS - TAXES?
- ALWAYS A TIME-LINE INTEREST
- ALWAYS INTERESTED IN WHO HAS INPUT - B.S.R.A.?

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

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File No. 07-8597

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MAR 19 2008
DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☒ I/we would like to be kept informed regarding this project. The contact name and address is:

Phone: (home:) summer home

E-mail:

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

I feel this is a very important environment assessment and we need to improve our sewage treatment practices.

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

File No. 07-8597

Schultz, Emily

From: Smolders, Janet
Sent: Monday, April 07, 2008 4:52 PM
To: Schultz, Emily
Subject: FW: Grand Bend Sewage Treatment Facility (STF) Expansion & Upgrade

---

From:
Sent: Sunday, April 06, 2008 7:36 PM
To: Smolders, Janet
Subject: Grand Bend Sewage Treatment Facility (STF) Expansion & Upgrade

I returned after being away on vacation to find your form in the mail Re: the above subject –
I would appreciate being kept informed of this project :

Thank You

Lambton Shores   MUNICIPALITY OF SOUTH HURON   MUNICIPALITY OF BLUEWATER 2001

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APR 07 2008
DILLON LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

____

____

____

Phone: ______________

E-mail: ______________

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

How long is it expected to be before sanitary sewer instalation occurs in Southcott Pines?

Please return this form by April 4, 2008 to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

DILLON CONSULTING

File No. 07-8597

THE MUNICIPALITY OF LAMBTON SHORES
GRAND BEND SEWAGE TREATMENT FACILITY EXPANSION AND UPGRADE
CLASS ENVIORNMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

RECEIVER BACKGROUND REVIEW MEETING

DATE:	March 19, 2008
TIME:	1:00 – 2:00 p.m.
LOCATION:	Erie Boardroom, Ontario Ministry of the Environment Southwestern Regional Office, 733 Exeter Road, London, Ontario

PRESENT:	Craig Newton, Environmental Planner - London Alison Munro, Surface Water Specialist – London John McGlynn, Senior Environmental Officer – Sarnia	Ministry of the Environment
	Louis Tasfi Janet Smolders Mark Brobbel Marcy McKillop	Dillon Consulting Limited
FILE:	07-8597	

Action By	Item
	1. Introductions
INFO	The Dillon Project Team for the Grand Bend Sewage Treatment Facility (STF) Upgrade Class Environmental Assessment and Preliminary Design was introduced. The team includes: • Louis Tasfi, Project Manager • Janet Smolders, Planner • Mark Brobbel, Aquatic Biologist • Marcy McKillop, Project Co-ordinator. Dillon is completing this project for the Municipalities of Lambton Shores, South Huron, and Bluewater. Peggy Van Mierlo-West, Director of Community Services with the Municipality of Lambton Shores, is managing this project on behalf of the other two municipalities. Peggy was unable to attend the meeting.
	2. Project Background
INFO	Janet Smolders provided an overview of the completed Grand Bend and Area Sanitary Sewage Servicing Study Master Plan completed in February, 2006. The Study Area for the Master Plan included portions of the following municipalities: • Lambton Shores – lands along both sides of Highway 21 from the Ausable Cut to Grand Bend (including Pinery Provincial Park)

Action By | Item

- South Huron – lands along both sides of Highway 21 from the Grand Bend boundary to the Bluewater boundary (Huron Road 83) including the southern portion of the hamlet of Dashwood. The Huron Country Playhouse, Grand Bend Motorplex and the Pickling and Onion Growers Plant along Grand Bend Line (Huron Road 81), south of Grand Bend were also included.
- Bluewater – lands along both sides of Highway 21 from Huron Road 83 to Huron Road 84, including the hamlet of St. Joseph. The northern portion of the hamlet of Dashwood was also included.

The Master Plan identified the preferred sanitary servicing solution as the provision of municipal sanitary sewage services for the entire study area outlined above (to be phased in over time), and the expansion and upgrade of the Grand Bend STF.

Janet indicated that the following ongoing projects related to the Master Plan are currently underway:

- Grand Bend STF Expansion and Upgrade Class Environmental Assessment and Preliminary Design: initiated in late 2007
- Pinery Provincial Park Sanitary Collection System Detailed Design: to be tendered in late March 2008
- North Lambton Shores Pressure Sewer (from Pinery Provincial Park to Grand Bend STF) Class Environmental Assessment and Preliminary Design: to be completed by Spring 2008
- Lambton Shores Zone 3 Sanitary Collection System Class Environmental Assessment and Preliminary Design (including Southcott Pines, Pinedale, Merrywoods, Huron Woods, Wee Lake Estates, Beach O'Pines, and Pinetree/Riverview subdivisions): to be initiated in the near future.

3. Project Status

INFO

The Grand Bend STF Expansion and Upgrade Class Environmental Assessment and Preliminary Design Project is currently underway. Public and agency consultation was initiated earlier this year. Dillon is currently updating population and flow projections prepared for the Master Plan. Louis indicated that the upgrade of the Grand Bend STF has the following tentative schedule:

- Class Environmental Assessment and Preliminary Design: to be completed by the end of 2008
- Detailed Design: to be completed in 2009
- Construction: upgraded plant to become operational in 2010.

4. Receiver Background Review

INFO

Marcy McKillop and Mark Brobbel provided a summary of Dillon's Technical Memo, dated March 17, 2008. Marcy provided some background information on the existing Grand Bend STF lagoons, and discussed background water quality and flow for the receiver, Parkhill Creek.

Action By	Item

Marcy indicated that Parkhill Creek is considered to be a Policy 2 Receiver with respect to Total Phosphorus and E.coli since water quality (75^{th} percentile of historical values at the McInnis Road and Desjardine Drain water quality monitoring stations) does not meet the Provincial Water Quality Objectives for these parameters.

Marcy also indicated that the 7Q20 flow (7-day average low flow with a recurrence period of 20 years) for Parkhill Creek, which would be considered in the case of an upgrade of the Grand Bend STF, would be 0 m^3/d, or the equivalent of no base flow.

Mark commented on the names of the receivers reported in the Memo. The Master Plan (February 21, 2006) referred to the Grand Bend STF receiver as the Gill-Lovie Drain, a tributary of Ausable River. Since the Master Plan was finalized, Dillon has learned through further communication with the Ausable Bayfield Conservation Authority that the names of the receivers are as follows:

- Shipka Drain (formerly referred to as the Gill-Lovie Drain) – the municipal drain that runs parallel to the treatment site's southern property boundary
- Parkhill Creek (formerly referred to as the Ausable River) – running from east of Parkhill north to Lake Huron.

Mark summarized the available information regarding fish species, species at risk, and the benthic community for Parkhill Creek. Mark indicated that Parkhill Creek provides habitat for river redhorse, which is a Species of Special Concern.

5. Effluent Criteria

INFO

Louis Tasfi provided an overview of the recommended effluent objectives and limits for the upgraded Grand Bend STF which was provided in Dillon's Technical Memo.

Louis explained that the TP limit of 0.15 mg/L was set by considering the 75^{th} percentile Total Phosphorus concentration at the upstream monitoring station (McInnis Road), which was 0.164 mg/L.

Alison Munro indicated that the effluent criteria proposed by Dillon were in-line with typical dry-ditch discharge criteria.

Alison and John McGlynn agreed with Dillon's assessment of Parkhill Creek as a Policy 2 Receiver, with respect to Total Phosphorus and E.Coli. They indicated that they were satisfied with the proposed TP effluent limit and objective of 0.15 mg/L and 0.10 mg/L, respectively. Louis indicated that the proposed Total Phosphorus limit and objective would significantly reduce the loading of phosphorus to the receiver.

Louis mentioned that B.M. Ross completed surface water quality monitoring for the Municipality of Lambton Shores in 2006, which was found to agree with historical water quality. He asked if any additional field work would be required to confirm the background water quality. Alison indicated that the background water quality data presented in Dillon's Technical Memo (dated March 17, 2008) was sufficient supporting material and that further field work would not be required.

Action By	Item

Louis inquired about the Ministry's policy regarding the use of the Canadian Water Quality Guidelines. Alison indicated that generally the Provincial Water Quality Objectives are adopted.

Craig Newton asked about the type of wastewater treatment that will be considered for the plant upgrade. Louis indicated that the Grand Bend STF would most likely be upgraded to a mechanical treatment plant with continuous discharge that employs UV disinfection. Louis noted that chlorination would not be used. Louis indicated that in order to reach to Total Phosphorus effluent quality proposed, alum dosage would likely be required. Louis also described the Tilbury Wastewater Treatment Plant Upgrade Project that Dillon conducted. For this project, Dillon included a wetland or sludge stabilization lagoon in their design to treat the removed sludge from the former lagoons. This removed sludge would otherwise have been sent offsite to a municipal landfill or land applied, at an added cost to the client. Louis indicated that the wetland contents would not be discharged, but that a portion of the contents would be sent to the mechanical treatment plant for treatment.

Craig commented on the seasonal nature of the Grand Bend area, and asked how this would impact the design of the upgraded STF. Louis indicated that the treatment plant could be designed with multiple treatment trains, and that one or more trains could be offline during the non-peak season. An aerated equalization lagoon may also have to be included in the upgrade to buffer daily peak loads.

6. Other Issues

INFO

Other issues discussed at the meeting were:

Septage Treatment:

The need to provide septage treatment at the upgraded Grand Bend STF was discussed. Craig indicated that there is no regulation in place that would require a treatment plant to be upgraded to include septage handling and treatment. Craig referred to the Provincial Policy Statement (2005) which requires municipalities to demonstrate that reserve sewage system capacity is available for the treatment of hauled septage, to allow new developments to be approved with onsite septic systems. Craig indicated that if the land application of septage is banned, the municipality must have a plan in place to handle and treat septage. Louis mentioned that, based on previous project experience, lime treatment has been identified as the most cost-effective solution for the treatment of septage. Louis voiced his concern that providing septage treatment at a municipal STF is costly and that there is no guarantee that septage haulers will transport septage to the upgraded STF.

Environmental Study Report (ESR):

Dillon to consider as part of Grand Bend STF Expansion and Upgrade Class EA

- Alison noted that the ESR should address the impact of the STF upgrade on Species at Risk
- Alison noted that the ESR should include proposed effluent quality in terms of concentrations, as well as loadings

Action By	Item
	• Craig noted that the ESR should specifically address the Ministry of the Environment Guideline D-2 to consider appropriate separation distances for the upgraded STF. Craig also noted that the ESR should address noise and odour issues.
	Certificate of Approval:
INFO	Louis asked if the old Certificates of Approval for the existing sewage pumping stations etc. would be consolidated with the new Certificate of Approval for the upgraded Grand Bend STF. John indicated that the Certificates of Approval would not likely be consolidated. He also indicated that the air and water Certificates of Approval would continue to be kept separate.
	7. Post Meeting Note
John to provide new Sarnia contact name to Dillon	John will be leaving the Sarnia Office and transferring to the Ministry of the Environment's London Office. John indicated that he will update the new project contact in the Sarnia Office regarding the project. The Sarnia Office will continue to be the local office for the Grand Bend STF.
INFO	Total Phosphorus Loading (75^{th} percentile): Currently the Grand Bend STF is discharging TP at a loading of 13 kg/d per discharge event. On an annual basis, the Grand Bend STF is discharging TP at a loading of 0.97 kg/d. Based on the proposed TP effluent concentration objective (0.10 mg/L) and limit (0.15 mg/L), the upgraded Grand Bend STF would discharge TP at a loading of about 0.50 kg/d and 0.74 kg/d, respectively. Note that the TP loading to the receiver would be reduced for the upgraded Grand Bend STF.

ERRORS AND/OR OMISSIONS

These minutes were prepared by Marcy McKillop who should be notified immediately of any errors and/or omissions.

DILLON CONSULTING LIMITED
LONDON, ONTARIO

March 26, 2008

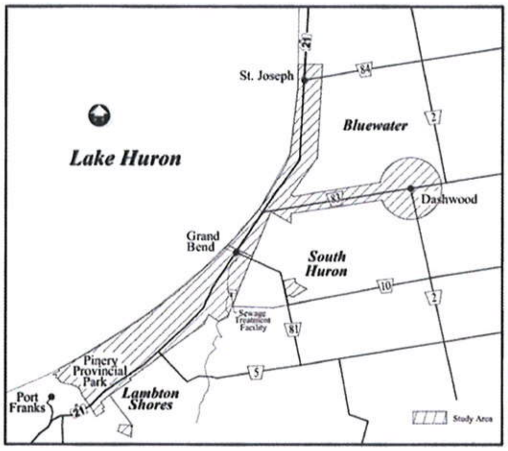
DISTRIBUTION:

All Present and
Peggy Van Mierlo-West (Municipality of Lambton Shores)
WWI

GRAND BEND SEWAGE TREATMENT FACILITY (STF)
EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Public Information Centre

The proposed expansion and upgrade of the Grand Bend STF will service portions of the Municipalities of Lambton Shores, South Huron and Bluewater over the next 20 years. Dillon Consulting Limited has recommended that an expansion and upgrade of the STF to a mechanical sewage treatment plant be selected as the preferred design for meeting the Study Area's immediate and future sewage treatment needs.



Study Area

Grand Bend STF

Public Information Centres to obtain public and agency input on the recommended design option will be held on:

July 15, 2008, 4:00 to 8:00 p.m. (informal drop-in session)

Grand Bend Public School Gymnasium

15 Gill Road, Grand Bend

and

August 16, 2008, 10:00 a.m. to 1:00 p.m. (informal drop-in session)

Dashwood Memorial Community Centre

158 Centre Street, Dashwood

If you have any comments, questions or concerns, please contact:

Peggy Van Mierlo-West
Director of Community Services
9575 Port Franks Road
R.R. 1, Thedford, Ontario
N0M 2N0
Tel: 519-243-1400
Fax: 519-243-3500
E-mail: pvmwest@lambtonshores.ca

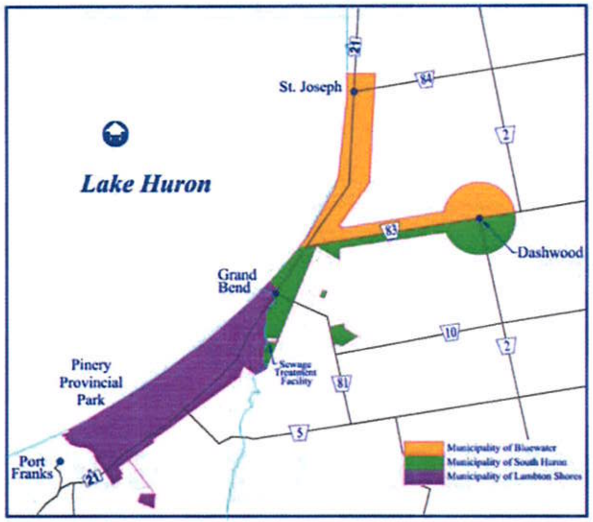
Janet Smolders, MCIP
Dillon Consulting Limited
Box 426, London, Ontario
N6A 4W7
Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Municipalities of Lambton Shores, South Huron & Bluewater

Grand Bend Sewage Treatment Facility (STF) Expansion & Upgrade Class Environmental Assessment & Preliminary Design

Public Information Centre
July 15, 2008

Grand Bend & Area Sanitary Sewage Master Plan (February 2006)



The Master Plan is a comprehensive, long-range document outlining sanitary sewage infrastructure improvements required to service lands in the Study Area over the next 20 years. The expansion and upgrade of the Grand Bend STF was identified as the preferred solution for meeting immediate and future sewage treatment needs of the Study Area.

Class EA & Pre-Design Process

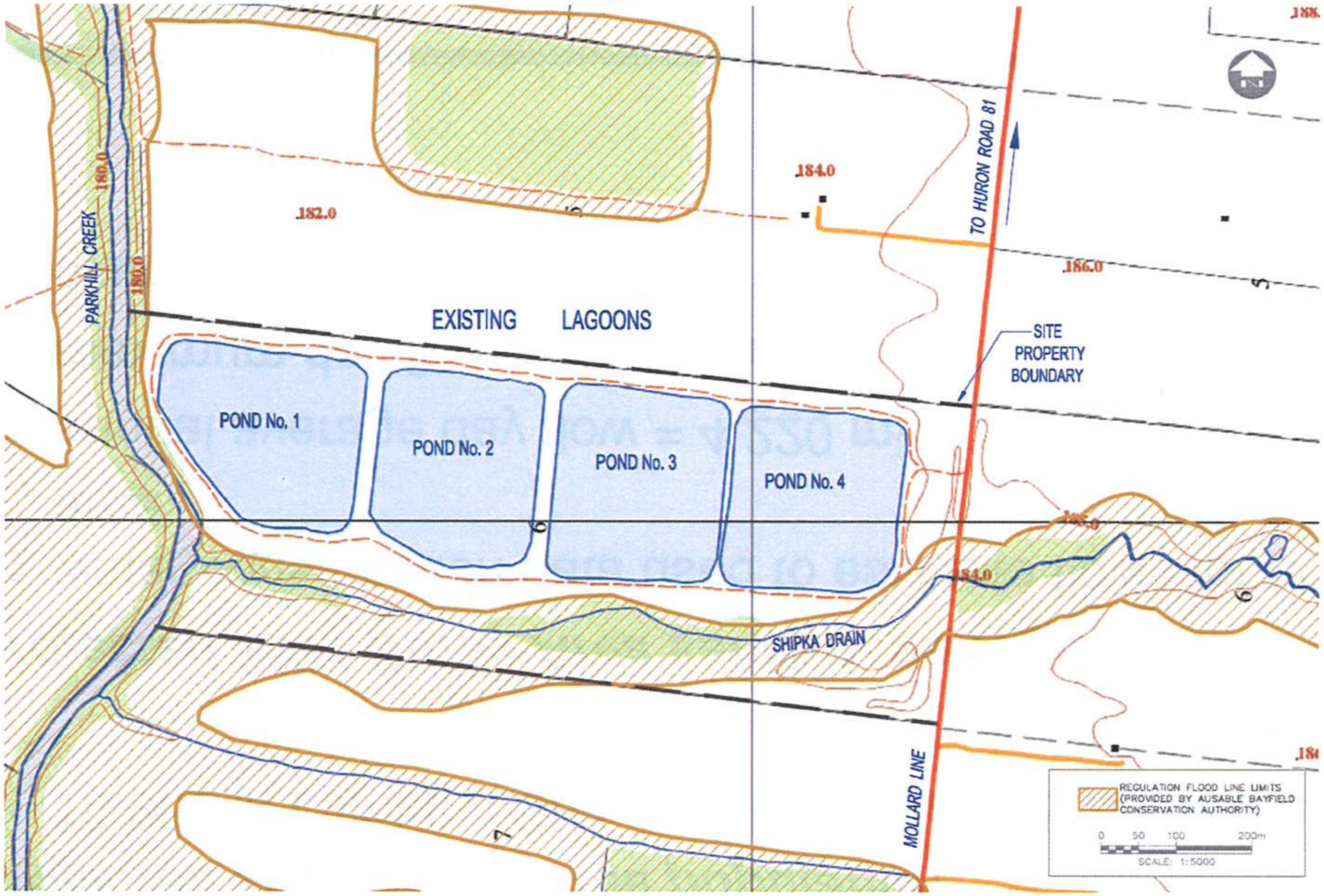
- process is following the "Municipal Class EA's" requirements for a Schedule "C" project:
  - ***Phases 1 and 2 Review and Update*** confirms the Master Plan's recommendations to expand and upgrade the Grand Bend STF
  - ***Phase 3*** evaluates ***Design Options*** for the expansion and upgrade:
    - prepared with input of archaeologists, terrestrial/aquatic biologists, land use/environmental planners
    - ends with a recommended design
  - during ***Phase 4***, EA is documented in an ***Environmental Study Report (ESR)*** placed on the public record for a 30-day review period.

Public & Agency Consultation
Project Initiation Notice (April 2008)

- approximately 20 comment forms received from agencies, local interest groups, ratepayer associations and developers – ***no significant concerns expressed to date***

- almost 160 residents replied to the notice:
  - most requested to be kept informed, with no comments
  - 10 residents approve based on environmental concerns
  - 6 disapprove due to costs (property owner & municipal costs) and potential impacts of the expanded STF (odour, noise)

Existing Conditions



The Grand Bend STF currently consists of four waste stabilization lagoons discharged on a seasonal basis to the Shipka Municipal Drain, and then to Parkhill Creek. The expansion and upgrade alternatives are constrained by the flood line limits.

Design Conditions for the Study Area

- ***projected 2031 Study Area population***
  - 10,950 in Lambton Shores, South Huron & Bluewater

- ***projected 2031 Study Area sanitary sewage flows***
  - water consumption data used to estimate flows for unserviced area
  - annual average day flow = 4,220 m^3/d
  - maximum day flow = 8,440 m^3/d
  - diurnal peaking factor = 2.66

Effluent Criteria

- **effluent** is the treated wastewater leaving the wastewater treatment plant
- current Certificate of Approval for the Grand Bend STF does not include effluent criteria due to age of the plant
- effluent criteria for upgraded STF based on:
  - review of background data, including water quality, for Parkhill Creek*
  - consultation with Ontario Ministry of the Environment (MOE)
- STF upgrade & expansion must meet these criteria:

Parameter	Effluent Objective Concentration	Effluent Non-Compliance Limit
Biochemical Oxygen Demand (BOD)	5 mg/L	10 mg/L
Total Suspended Solids (TSS)	5 mg/L	10 mg/L
Ammonia-Nitrogen	summer: 1 mg/L winter: 2 mg/L	summer: 2 mg/L winter: 4 mg/L
Un-ionized Ammonia Nitrogen	---	0.016 mg/L
Total Phosphorus	0.1 mg/L	0.15 mg/L
Escherichia Coli (monthly geometric mean density)	100 organisms/100mL	150 organisms/100mL

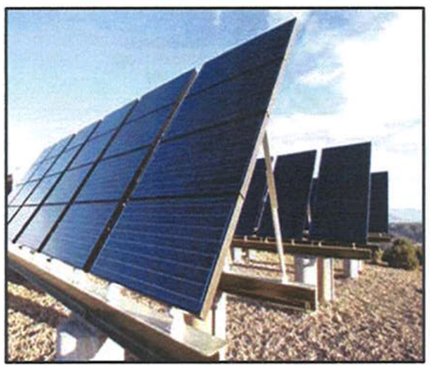
* A copy of Dillon's "Receiver Background Review" is available on request

Treatment Process Components

The expanded and upgraded STF requires the following process components:

- inlet works
  - screening to remove large solids and
  - potentially grit removal
- biological treatment
  - removal of organic material through oxidation of dissolved and particulate biodegradable constituents
- tertiary filtration
  - further treatment to ensure effluent meets criteria for Total Suspended Solids and Total Phosphorus
- Ultraviolet (UV) disinfection
  - removal of microbial contaminants before effluent is discharged to Shipka Drain

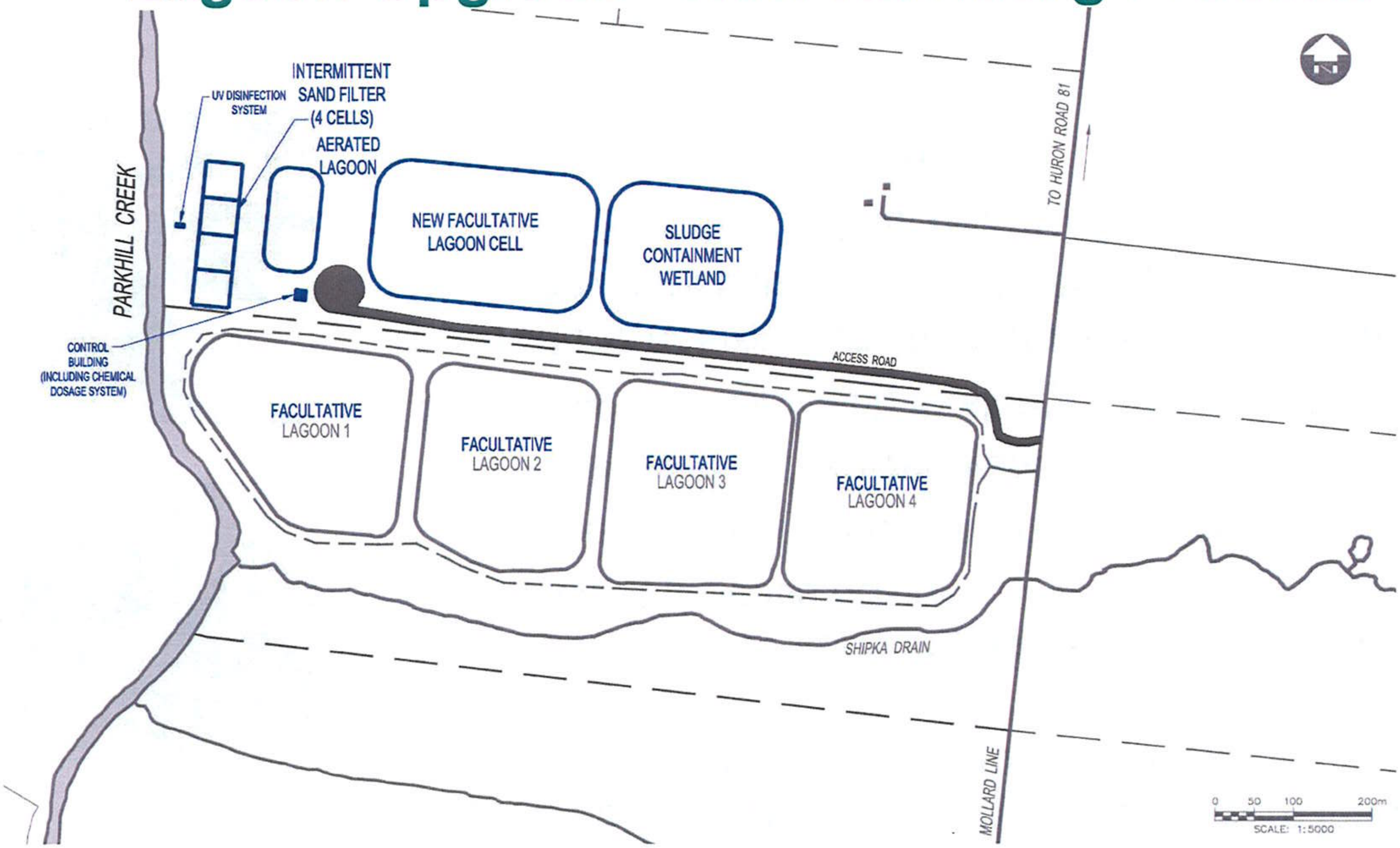
Sustainable Design Concepts



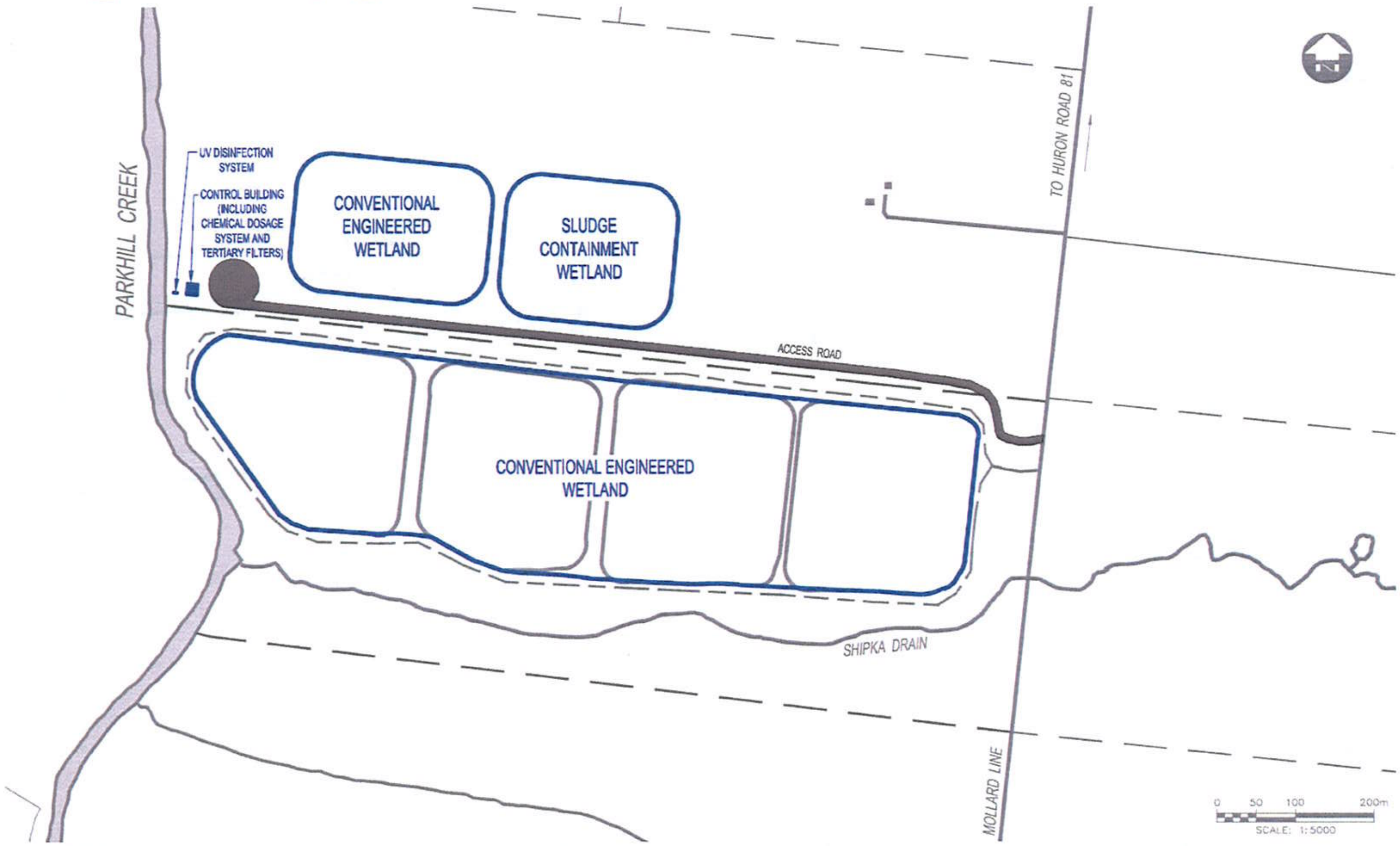
The following sustainable design concepts were integrated into the alternatives developed for this project:

- reduce energy consumption and provide energy efficient process design:
  - recovery of heat from treated effluent
  - recycling of blower waste heat
- innovative approach to sludge management
- reduce energy demand from the grid through onsite renewable source(s) of power:
  - solar photovoltaic (PV) system
  - wind turbine system
  - bioenergy/biogas system
  - geothermal system

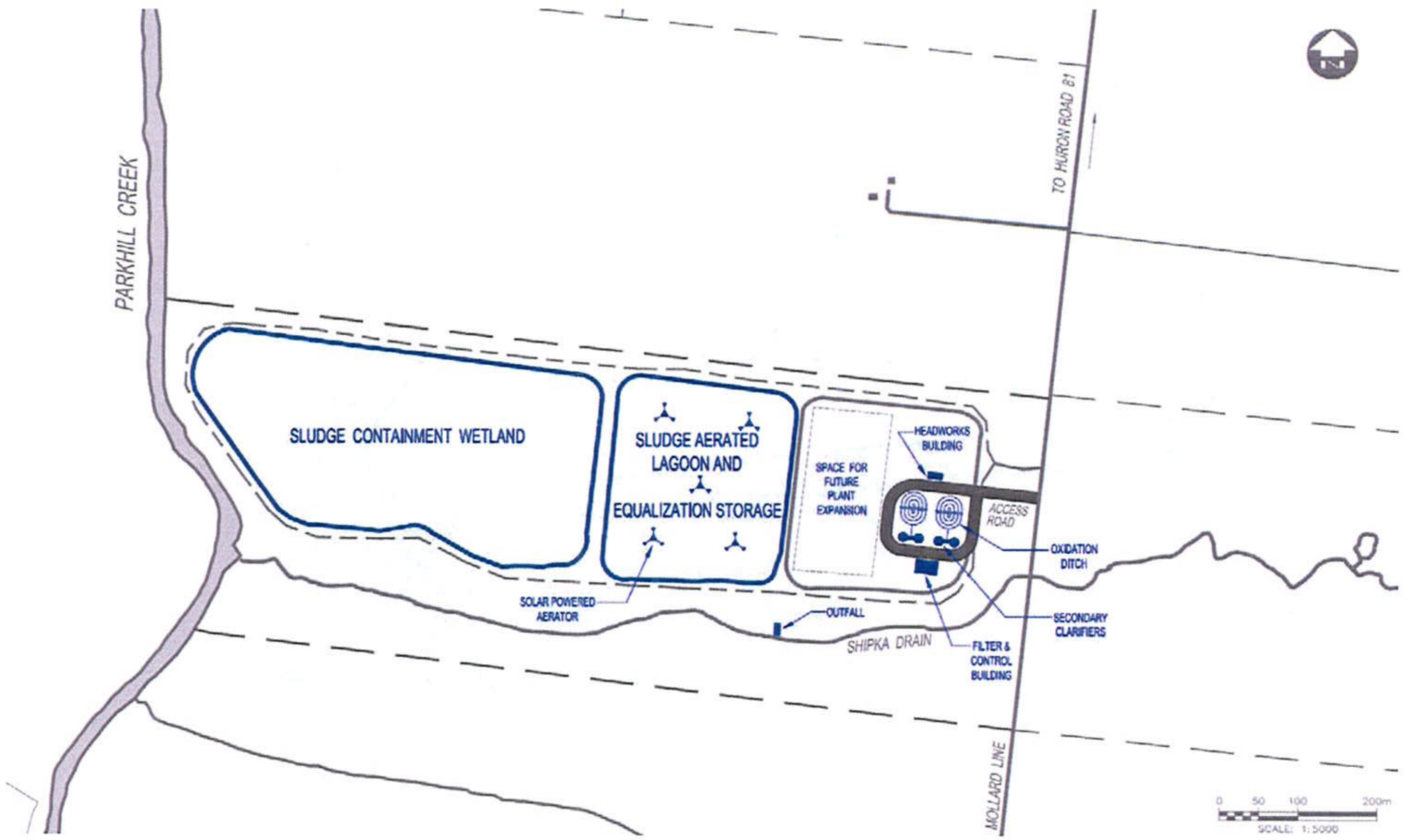
Alternative 1
Lagoon Upgrade - New Hamburg Process



Alternative 2
Lagoon Upgrade - Wetland/Natural Treatment



Alternative 3
Mechanical Treatment Plant Upgrade (*recommended*)



Four biological treatment system options were evaluated for a mechanical treatment plant upgrade:

- Conventional Activated Sludge System
- Membrane Bioreactor
- Sequencing Batch Reactor
- Biological Nutrient Removal Oxidation Ditch System

Based on an evaluation of these options (including cost), the ***Biological Nutrient Removal Oxidation Ditch System*** was identified as preferred.

Comparative Evaluation of Expansion & Upgrade – Alternatives 1, 2 & 3

Grand Bend Sewage Treatment Facility Expansion & Upgrade, Class EA and Preliminary Design
Comparative Evaluation of Expansion and Upgrade Alternatives 1, 2 & 3

Evaluation Factors & Indicators	Alternative 1 Lagoon Upgrade New Hamburg Process	Alternative 2 Lagoon Upgrade Wetland/Natural Treatment	Alternative 3 Mechanical Treatment Plant Upgrade *Recommended*	Preferred Alternative
Description				
Treatment Process Description	Existing lagoons modified and expanded to provide modified lagoon treatment known as New Hamburg process	Existing lagoons modified and expanded to either conventional engineered wetland or controlled wetland, such as a proprietary wetland system	Existing lagoons decommissioned and replaced with mechanical treatment plant	--
Service & Reliability				
Flexibility of Service	Process can handle variable flows. Process flexibility limited by storage and retention time	Same as Alternative 1	Process can handle variable flows and loading rates. Highly flexible with no limitations	Alternative 3
Reliability of Service	Provides reliable treatment, but chemical precipitation is required to provide reliable removal of phosphorus	May not provide reliable year-round ammonia removal by nitrification due to cold climate. Can be addressed by : - covering lagoon cells (Lemna proprietary wetland system) - adding attached growth media. Chemical precipitation required for reliable phosphorus removal. Considered an innovative technology (limited use in Ontario and Canada). Requires MOE monitoring for 3 years before effluent can be discharged – limits development in Study Area	Provides reliable treatment with no limitations	Alternative 3
Treatment Capacity (next 20 years)	Cannot be efficiently operated for treatment systems with larger capacities. Generally suitable for systems with flow capacities of less than 3,300 m^3/day (less than Study Area's projected 20-year design flow)	Typically in Ontario, systems generally have flow capacities of less than 1,500 m^3/day (less than Study Area's 20-year design flow)	Mechanical Treatment Plants can be effectively operated for a range of treatment capacities. Modular plant design allows treatment capacity to be increased in phases	Alternative 3
Ease of Construction, Operation & Maintenance (O&M)	Simple construction involving mainly civil/earthwork type activities. O&M simple due to simplicity of process, but less control over plant performance and effluent quality	Same as Alternative 1	Multi-disciplinary plant construction. More complex system to operate and maintain, but provides increased process flexibility and more consistent plant performance	Alternative 3
Land Use Compatibility				
Compatibility with adjacent/surrounding Existing & Planned Land Uses	Additional land required potentially impacts adjacent/surrounding uses	Same as Alternative 1	No additional land required	Alternative 3
Potential to Service Future Growth (beyond 20 years)	Due to technical limitations and costs, not suitable for beyond 20 year design horizon. Requires significant additional land for expansion and decommissioning and replacement with a mechanical plant	Same as Alternative 1	Modular plant design allows for cost-effective future upgrades. No process components likely require decommissioning – can be used beyond 20 year design horizon	Alternative 3

Comparative Evaluation of Expansion & Upgrade – Alternatives 1, 2 & 3 (cont')

Grand Bend Sewage Treatment Facility Expansion & Upgrade, Class EA and Preliminary Design Comparative Evaluation of Expansion and Upgrade Alternatives 1, 2 & 3				
Evaluation Factors & Indicators	**Alternative 1** **Lagoon Upgrade** **New Hamburg Process**	**Alternative 2** **Lagoon Upgrade** **Wetland/Natural Treatment**	**Alternative 3** **Mechanical Treatment Plant Upgrade** *Recommended*	**Preferred Alternative**
Protection of Natural Environment				
Potential Loss/Adverse Impacts on Natural Environmental Features	Additional land required may result in loss of natural features. Lagoons provide bird/mammal habitat thereby improving ecological integrity of site. Other potential adverse impacts can be avoided/mitigated	Additional land may result in loss of natural features. Wetland provides bird/mammal habitat, but unreliable ammonia removal could cause adverse environmental impacts	No additional land required. Unused land can be returned to the environment by naturalization. Other potential adverse impacts can be avoided/mitigated	Alternative 3
Protection of Cultural, Socio-Economic Environment				
Potential Impacts on Cultural Resources	Additional land required affects more land with high archaeological potential	Same as Alternative 1	Minimizes potential impacts by affecting less land with archaeological potential	Alternative 3
Potential Impacts on Socio-Economic Environment	Greater potential for odour impacts from open lagoons	Same as Alternative 1	Plant's enclosed process components minimize impacts. Tankage can be covered for odour control	Alternative 3
Sludge Management				
Sludge Management Requirements	Requires dredging once every 10 years for further treatment and disposal. Sludge containment wetland provides sludge storage/treatment with natural habitat features	Same as Alternative 1	Existing lagoon sludge and sludge generated by plant requires handling and treatment. Sludge containment wetland provides sludge storage/treatment with natural habitat features	Alternative 3
Cost				
Relative Capital Costs	Moderate capital costs (potentially equivalent to mechanical treatment plant depending on required lagoon upgrades). Additional land is an added cost	Same as Alternative 1	High capital cost Costs could be phased in over time (i.e. 3 phases of plant expansion over 20 years)	Alternatives 1 & 2
Relative Operating & Maintenance Costs	Higher O&M costs than existing lagoon system. Lower than mechanical treatment plant alternative	Same as Alternative 1	Higher O&M costs Costs could be reduced through innovative design features	Alternatives 1 & 2

Sludge Management & Treatment

All expansion and upgrade alternatives require that sludge in the existing lagoons be removed and treated.

- sludge management options include:
  - transportation of sludge to a landfill
  - transportation of sludge to various sites for land application
  - management and treatment of sludge onsite.

- an innovative approach to onsite sludge management is:
  - less labour-intensive and does not require frequent transportation of sludge offsite, and
  - less costly since disposal costs such as landfill tipping fees are avoided.

Preferred Sludge Management Approach

➢ Aerated Lagoon:
- aerobic digestion or treatment of sludge
- aeration achieved through use of solar-powered aerators in the lagoon.

➢ Sludge Containment Wetland:
- follows aerated lagoon and provides further treatment and storage of sludge
- incorporates vegetation and provides a natural habitat that acts as a “carbon sink”.



➢ Anaerobic Sludge Digestion Co-generation System:
- methane is produced during anaerobic sludge digestion
- methane is converted to carbon-dioxide using a co-generation engine, thus reducing the global warming potential of the remaining greenhouse gases
- generates heat and electricity to heat the digester and power onsite equipment
- ***to be considered and implemented only if funding and grants are provided to reduce the capital cost***

Costs

The Grand Bend STF can be upgraded to a Mechanical Treatment Plant (including the Biological Nutrient Removal Oxidation Ditch treatment process) over a 20 year period in three phases as areas become serviced. Costs of the three phases are:

Phase	Annual Average Day Capacity	Capital Cost Estimate*	Annual Operating & Maintenance Cost Estimate**
1	2,110 m^3/day (0.464 MIGD)	$ 12.9 M	$330,000 /year
2	3,165 m^3/day (0.696 MIGD)	$ 3.2 M	$410,000 / year
3 (ultimate)	4,220 m^3/day (0.928 MIGD)		$460,000 / year

*estimates of probable construction costs

**operating and maintenance costs could be reduced through energy-efficient process design

Service Area, Phasing & Timing of Construction

As recommended by the Master Plan, improvements over the next 20 years are:

- ***top two priority projects currently underway:***
  1. Pinery Provincial Park and Southbend Estates to be serviced in 2009 by remaining allocated STF capacity
  2. Grand Bend STF Expansion & Upgrade expected to be operational by 2012 (subject to approvals)

- ***servicing of remaining Study Area to be confirmed by Lambton Shores, South Huron and Bluewater in subsequent sewage collection system Class EA's:***
  3. existing subdivisions and developments west and south of Southbend Estates to Ausable River "Cut" in Lambton Shores
  4. South Huron from Grand Bend to Huron Road 83, including Oakwood Park
  5. the Bluewater lakeshore
  6. Dashwood.

What's Next?

- Lambton Shores, South Huron and Bluewater will consider all comments received
- based on this input and more detailed evaluations, the three municipalities will select preferred alternatives for expanding and upgrading the STF
- complete ESR by late fall and publish Notice of Completion advertising 30-day review period
- following clearance of ESR, the project may proceed to design and construction.

Thank you for attending.

Please complete a comment form & submit to Dillon by September 2, 2008

GRAND BEND SEWAGE TREATMENT FACILITY (STF)
EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Public Information Centre

The proposed expansion and upgrade of the Grand Bend STF will service portions of the Municipalities of Lambton Shores, South Huron and Bluewater over the next 20 years. Dillon Consulting Limited has recommended that an expansion and upgrade of the STF to a mechanical sewage treatment plant be selected as the preferred design for meeting the Study Area's immediate and future sewage treatment needs.

Study Area

Grand Bend STF

A ***Public Information Centre*** to obtain public and agency input on the recommended design option will be held on:

August 16, 2008, 10:00 a.m. to 1:00 p.m. (informal drop-in session)

Dashwood Memorial Community Centre

158 Centre Street, Dashwood

If you have any comments, questions or concerns, please contact:

Peggy Van Mierlo-West
Director of Community Services
9575 Port Franks Road
R.R. 1, Thedford, Ontario
N0M 2N0
Tel: 519-243-1400
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Janet Smolders, MCIP
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Box 426, London, Ontario
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Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Municipalities of Lambton Shores, South Huron & Bluewater

Grand Bend Sewage Treatment Facility (STF) Expansion & Upgrade Class Environmental Assessment & Preliminary Design

Public Information Centre
August 16, 2008

Smolders, Janet

From: Filipowitz, Steve (MNR) [steve.filipowitz@ontario.ca]
Sent: Wednesday, August 13, 2008 11:16 AM
To: pvmwest@lambtonshores.ca; Tasfi, Louis
Cc: Smolders, Janet; Swick, John (MNR); Kloske, Bob (MNR); Salo, John (MNR)
Subject: Grand Bend STF Expansion Class EA

Hi Peggy,

I reviewed the Public Information Centre (PIC) package from July 15, 2008 and have some comments related to the Ministry's potential cost sharing amounts for the preferred alternative of a mechanical sewage plant to replace the existing lagoon system. This is the first time we have seen an estimate since June and September of 2006.

Back in June 2006, the plant total flow expansion capacity (not incl. Bluewater and South Huron) was 3512 cu m/day. The Pinery allocation was for 470 cu m/day resulting in a 13.4% cost share. That project's probable cost was estimated at $9.7M with our share equivalent to $1.298M incl. engineering and contingency.

The July 15, 2008 PIC handout on Page 17 has different numbers. The plant total flow expansion capacity for phase 1 (excl. Bluewater and South Huron) is 2,110 cu m/day. In phase 2 the capacity goes to 3,165 cu m/day. In phase 3 the capacity goes to the ultimate 20 year size 4,220 cu m/day. Phase 1 costs are now estimated at $12.9M. Phase 2 and 3 costs are lumped together for a total of $3.2M I assume including engineering and some contingencies. The PIC handout on page 17 and 18 doesn't fully explain what is included in the phasing. Perhaps there were drawings at the PIC that revealed this info, but the handout does not. I am confused with the different plant capacities, phasing and how it could impact our costs in the future.

I understand at some point, the municipality will want to discuss amendments to the Ministry – Lambton Shores Agreement for the overall costs should they in fact increase. Because you haven't tendered the collection system, I would say it isn't prudent to start this discussion formally yet.

In the meantime, it may be prudent for the Municipality to confirm the validity of the previous cost sharing formula and get an updated accounting of what the MNR costs could be based on actual engineering services rendered/proposed and recent EA construction estimates for information purposes.

Please consider this and reply as soon as possible. If you have any questions, please call me.

Yours truly,

Steven D. Filipowitz, P. Eng.
Supervisor, Environmental & Design Services
Ontario Parks
300 Water Street
P.O. Box 7000
6th Floor, South Tower
Peterborough, Ontario
K9J 8M5
Tel: 705-755-1706
Fax: 705-755-1735

Smolders, Janet

From: Peggy Van Mielo-West [pvmwest@lambtonshores.ca]
Sent: Wednesday, August 13, 2008 2:10 PM
To: 'Filipowitz, Steve (MNR)'; Tasfi, Louis
Cc: Smolders, Janet; 'Swick, John (MNR)'; 'Kloske, Bob (MNR)'; 'Salo, John (MNR)'
Subject: RE: Grand Bend STF Expansion Class EA

Hi Steve

We will have Dillon review the cost estimates and get back to you with a comment.

Peggy Van Mierlo-West
Director of Community Services

519-243-1400

From: Filipowitz, Steve (MNR) [mailto:steve.filipowitz@ontario.ca]
Sent: Wednesday, August 13, 2008 11:16 AM
To: pvmwest@lambtonshores.ca; Tasfi, Louis
Cc: Smolders, Janet; Swick, John (MNR); Kloske, Bob (MNR); Salo, John (MNR)
Subject: [SPAM?] Grand Bend STF Expansion Class EA

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Yours truly,

Steven D. Filipowitz, P. Eng.
Supervisor, Environmental & Design Services
Ontario Parks

Ministry of Municipal Affairs and Housing

Municipal Services Office - Western

659 Exeter Road, 2nd Floor
London ON N6E 1L3
Tel. (519) 873-4020
Toll Free 1-800-265-4736
Fax (519) 873-4018

Ministère des Affaires municipales et du Logement

Bureau des services aux municipalités - région de l'Ouest

659, rue Exeter, 2e étage
London ON N6E 1L3
Tél. (519) 873-4020
Sans frais 1 800 265-4736
Téléc (519) 873-4018

Ontario

RECEIVED
JUL 10 2[illegible]
DILLON, LONDON

July 9, 2008

Ms. Janet Smolders, MCIP
Dillon Consulting Limited
Box 426, London, ON N6A 4W7

Re: Grand Bend Sewage Treatment Facility Expansion and Upgrade Class Environmental Assessment and Preliminary Design County of Lambton and County of Huron

Dear Ms. Smolders:

Thank you for your recent circulation of the above-noted matter to us for our review. In this regard, we offer the following comments for your consideration.

The purpose of this Environmental Assessment is to review options to expand and upgrade the Grand Bend Sewage Treatment Facility to serve portions of the Municipalities of Lambton Shores, South Huron, and Bluewater over the next twenty years.

This office provides access to provincial services on municipal government, finance and administration, as well as land use planning and development issues covered under the Planning Act. Section 2 of the Planning Act speaks to matters of provincial interest. This section directs decision-making bodies (whether it is a council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, or the Ontario Municipal Board) to be consistent with the policy statements issued under Section 3 of the Planning Act in exercising any authority that affects a planning matter.

The current policy on land use planning matters in Ontario is the "Provincial Policy Statement 2005" (PPS). The PPS speaks to issues such as the promotion of efficient, cost-effective development and land use patterns and the proper consideration of the various resources of this province, as well as matters dealing with public health and safety. A copy of the PPS is available on our website at:

http://www.mah.gov.on.ca/Page215.aspx

The requirements of the Planning Act apply to applications for planning approvals under this legislation; these applications include official plan amendments and zoning bylaw amendments. From our review of this particular matter, it appears that no such approvals are being sought in this case. However, this project may have implications with respect to those matters covered by the PPS as noted above, and we recommend that you consider these policies in your review of this undertaking.

Environmental Assessments that examine sewage services should incorporate implications for population and growth forecasts, ensure that these systems are provided in a manner that: 1) can be sustained by the water resources upon which such services rely; 2) is financially viable and complies with all regulatory requirements; and 3) protects human health and the natural environment. Additionally, you should ensure that the local Official Plan policies are integrated into the assumptions regarding the preferred solution recommended under this evaluation process.

Finally, our comments on this undertaking should not be considered as approval for any other related applications under the Planning Act or other provincial legislation that may be required, may be related to, or may result from this project.

Please keep us on your circulation list for this project. If you have any questions or comments, please telephone me at (519) 873-4768.

Sincerely,

Kevin McClure
Planner, MSO - West

Telephone Discussion Record

DILLON CONSULTING

Call FROM Richard Vardenboorn MTO Chatham Office. Date

Organization

Phone No. 519-354-1400 Ext. 2220 Fax No.

Call TO JMS

Project GB STF PIC File No. 07-8597

Subject Impacts on Highway 21 Copies to File

Richard called to ask about potential impacts on Hwy. 21. I explained that:

- the main access route is Mollard Line + Huron Road 81
- the collection systems for Pirery Park + Zone 4 are being designed to avoid the Hwy. 21 right-of-way. Both projects are in the Detailed Design stage. We are working with MTO for the required permits to HDD the pipes across the ROW.

Signed Janet

Dillon Consulting Limited

Roadhouse, Emily

From: Henry, Andrew [AHenry@london.ca]
Sent: Wednesday, September 24, 2008 9:51 AM
To: Schultz, Emily
Cc: Smolders, Janet; Tasfi, Louis
Subject: RE: Class Environmental Assessment - Grand Bend Sewage Treatment Facility
Attachments: IPZ_Huron 19Feb2008.pdf

Good morning Emily;

We have an IPZ-1 and IPZ-2 delineated in draft (attached) but which is subject to change as a result of the proposed changes to the legislation (Director's Direction). In addition, we will now be required to identify an IPZ-3 that will extend further inland (to an unknown extent at this time). The IPZ-3 will identify further and additional areas of concern, beyond IPZ-2, in accordance with the proposed Director's Direction. As a result, the completion of the delineation of Intake Protection Zones and subsequent vulnerability and risk assessments are on hold pending the finalization of the Director's Direction.

Best regards,

Andrew J. Henry, P.Eng.
Division Manager, Regional Water Supply
Lake Huron & Elgin Area Water Supply Systems
c/o City of London Regional Water Supply Division
29 Kilworth Park Drive, RR5
Komoka, Ontario N0L 1R0
T: 519.661.2500 x2714
T: 519.661.2500 x1355 (Direct)
F: 519.474.0451
E: ahenry@london.ca
www.watersupply.london.ca

From: Schultz, Emily [mailto:ESchultz@dillon.ca]
Sent: September 23, 2008 4:02 PM
To: Henry, Andrew
Cc: Smolders, Janet; Tasfi, Louis
Subject: RE: Class Environmental Assessment - Grand Bend Sewage Treatment Facility

Good Afternoon Andrew,

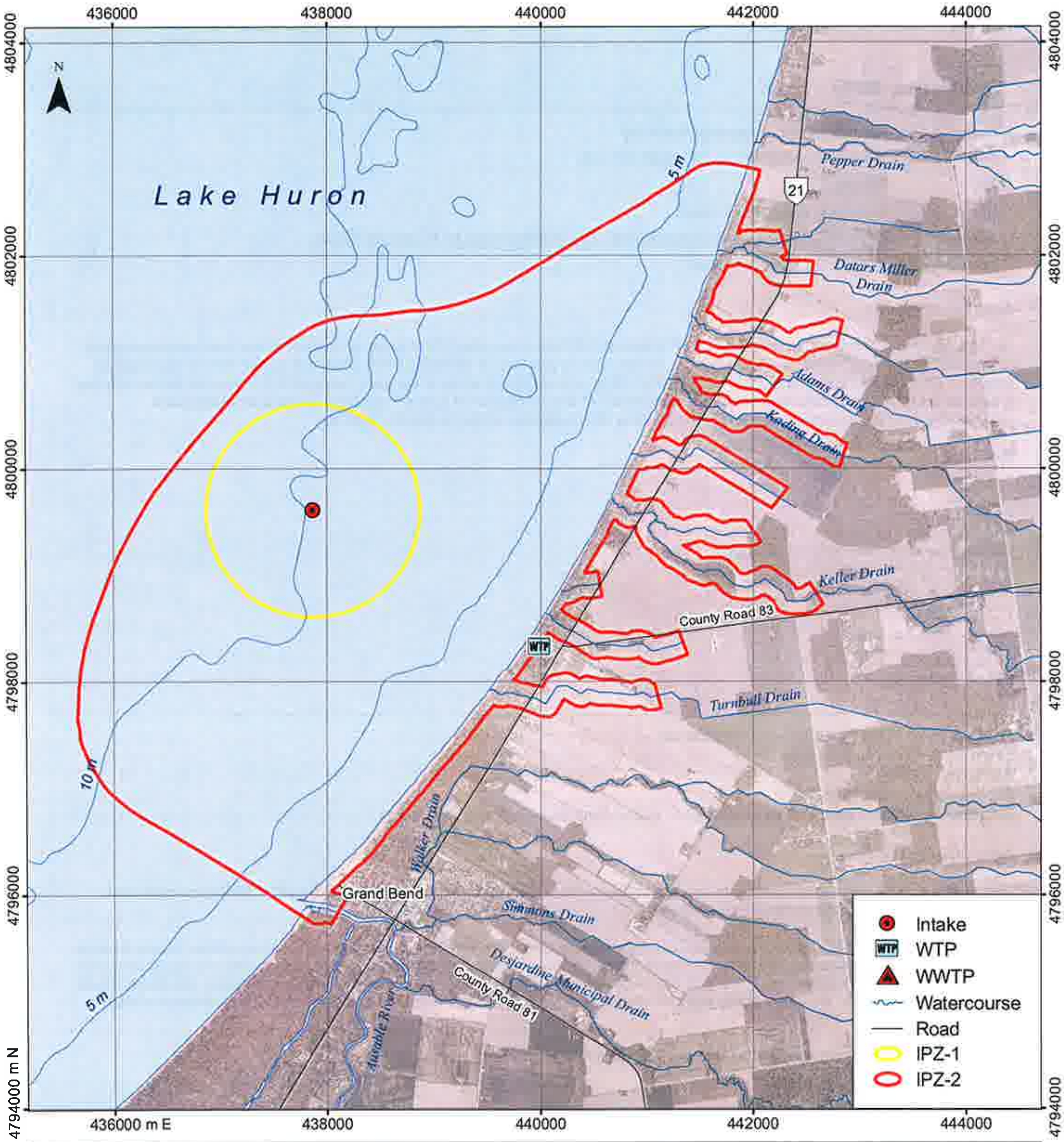
I am writing in response to the comments you submitted for the Grand Bend Sewage Treatment Facility (STF) Expansion and Upgrade Class Environmental Assessment project.

We understand that a draft Intake Protection Zone has recently been delineated by the Lake Huron Primary Water Supply System for the water treatment plant at 71155 Bluewater Highway. IPZ-2, as delineated in draft, currently extends into the Study Areas for both the STF and South Grand Bend 'Zone 3' Sanitary Sewage Collection System projects (see attached maps). We would like to know about the status of the vulnerability and risk assessment studies that you mentioned, as well as the availability of a map showing the location of IPZ-2.

We look forward to hearing from you at your earliest convenience.

Emily

Emily (Schultz) Roadhouse
Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, ON N6A 4W7
T: 519-438-6192, Ext. 1315
F: 519-672-8209
eschultz@dillon.ca



Imagery © Ausable Bayfield Conservation Authority.
Topographic data © Natural Resources Canada.
Bathymetry courtesy of NOAA.
Projection: UTM Zone 17N, NAD 1983

1 0 1 2 Km

DRINKING WATER SOURCE PROTECTION

Stantec

RIGGS ENGINEERING

HCCL Coastal & River Engineering Water Resources & Environmental Hydraulics

Project

Lake Huron Primary Water Supply System Source Protection Technical Study

Figure No.	Revision No.	Date
4.1	**2**	**Feb. 19, 2008**

Title

Lake Huron WTP Intake Protection Zones

Smolders, Janet

From: Henry, Andrew [AHenry@london.ca]
Sent: Friday, July 04, 2008 7:52 AM
To: Peggy Van Mierlo West
Cc: Smolders, Janet; Lima, Brian
Subject: Class Environmental Assessment - Grand Bend Sewage Treatment Facility

I am in receipt of the notice for the Public Information Centre for the Grand Bend Sewage Treatment Facility Expansion and Upgrade Class Environmental Assessment. On behalf of the Lake Huron Primary Water Supply System, we continue to be interested in the development and planning for this project.

I would also like to bring to your attention that the Lake Huron Primary Water Supply System has completed the draft Intake Protection Zone delineation (Source Water Protection – Module 4) for the water treatment plant facility located at 71155 Bluewater Highway. For your information and reference, I feel that it is important for you to know that the IPZ-2 as delineated in draft currently extends into your delineated study area for your Class Environmental Assessment and may have future implications on land use planning, as well as various point and non-point sources of potential contamination which could potentially include existing septic system discharges. At this time, the necessary vulnerability and risk assessment studies have not been completed which provide further input to the development of the Source Protection Plan for our area. Once completed, this information will be provided to the Ausable Maitland Valley Source Protection Region (Ausable Bayfield Conservation Authority as lead) for consideration and integration into the Source Protection Plan.

Should you require any further information, please feel free to contact me at your convenience.

Best regards,

Andrew J. Henry, P.Eng.
Division Manager, Regional Water Supply
Lake Huron & Elgin Area Water Supply Systems
29 Kilworth Park Drive, RR5
Komoka, Ontario N0L 1R0
T: 519.661.2500 x2714
T: 519.661.2500 x1355 (Direct)
F: 519.474.0451
E: ahenry@london.ca
www.watersupply.london.ca

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Please fill out this form and return it to Dillon Consulting Limited.

☑ I/we would like to be kept informed regarding this project. The contact name and address is:

Ken Clarke; Outside Plant Super;
Box 99, Zurich Ont, Nom-2TO.

Phone: 519-236-4333.

E-mail: hay@hay.net

☐ I/we do not wish to be kept informed of this project.

Comments/Questions/Concerns:

Wish to be kept abreast and involved. of all design & preliminary planning as per extensive Underground Telco Plant and facilities. Major Consideration due to Large fibre and distribution network. $$!!

Please return this form by **April 4, 2008** to:

Dillon Consulting Limited
Box 426 London, Ontario
N6A 4W7

Tel: 519-438-6192
Fax: 519-672-8209
E-mail: jsmolders@dillon.ca

Attention: Janet Smolders, MCIP
Land Use and Environmental Planner

File No. 07-8597

Lambton Shores — Municipality of South Huron — Municipality of BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: BLUEWATER SHORELINE RESIDENTS' ASSOCIATION

Address and Postal Code: GMB 411
ZURICH ON N0M 2T0

Telephone: **Fax:**

E-mail: purvisjd@execulink.com

Comments: BLUEWATER SHORELINE RESIDENTS' ASSOCIATION SUPPORTS THE UPGRADE OF THE GRAND BEND STF AND THE SERVICING OF THE BLUEWATER SHORELINE AS STATED AT THE HENSALL PUBLIC MEETING AUGUST 4 2008

JAN PURVIS
PRESIDENT
BLUEWATER SHORELINE
RESIDENTS' ASSOCIATION

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

Schultz, Emily

From: Fraser, James [jfraser@mcleankerr.com]
Sent: Monday, August 11, 2008 3:12 PM
To: Schultz, Emily
Subject: RE: South Huron, Lambton Shores, Bluewater - proposed sewage facility

Thank you Emily.
I hope to be at the Dashwood public information meeting this coming Saturday.

Jim Fraser
McLean & Kerr LLP
Suite 2800, 130 Adelaide Street West
Toronto, Ontario
M5H 3P5

T – 416 369.6613
M – 416 418.8527
F – 416 366.4183

e-mail: jfraser@mcleankerr.com
web: mcleankerr.com

****

****

From: Schultz, Emily [mailto:ESchultz@dillon.ca]
Sent: August 11, 2008 2:34 PM
To: Fraser, James
Cc: Smolders, Janet; Peggy Van Mierlo West
Subject: RE: South Huron, Lambton Shores, Bluewater - proposed sewage facility

Good Afternoon Mr. Fraser:

Thank you for your interest in Grand Bend Sewage Treatment Facility (STF) Upgrade and Expansion project. Your name has been added to the Contact List for the project.

An electronic version of the material presented at the Public Information Centre (PIC) on July 15, 1008 is available from the Lambton Shores web site at http://www.lambtonshores.ca/living//index.htm. A second PIC will be held to present this same information on Saturday, August 16 at the Dashwood Memorial Community Centre from 10:00 am to 1:00 pm.

If you require further information, please call me at 1-888-345-5668, ext. 1315.

Emily Schultz

Emily A. Schultz
Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400

London, ON N6A 4W7
T: 519-438-6192, Ext. 1315
F: 519-672-8209
eschultz@dillon.ca

From: Smolders, Janet
Sent: Thursday, July 31, 2008 3:24 PM
To: Schultz, Emily
Subject: FW: South Huron, Lambton Shores, Bluewater - proposed sewage facility

From: Fraser, James [mailto:jfraser@mcleankerr.com]
Sent: Thursday, July 31, 2008 2:47 PM
To: Keli, Rob; Smolders, Janet
Subject: South Huron, Lambton Shores, Bluewater - proposed sewage facility

I am the Vice-President of Maple Grove Syndicate Limited which is the owner of approximately 45 acres of lakefront land immediately north of Oakwood Park in South Huron. There are 12 cottages located on the Maple Grove property.
I understand that Dillon Consulting are the consulting engineers for the proposed expansion of the Grand Bend sewage treatment facility and the provision of sanitary sewers to the lakefront properties from Port Franks north to highway 83 and beyond.
From a review to the Lakeshore Advance of July 23, 2008, it appears that a public meeting was held in Grand Bend recently and that there is another public meeting planed for Saturday August 16 in Dashwood to provide information relating to this project. Can you please confirm the time and place of the public meeting in Dashwood.
Also, could you point me to a web site which might provide further information relating to this project.

Jim Fraser
McLean & Kerr LLP
Suite [illegible], 130 Adelaide Street West
Toronto, Ontario
M5H [illegible]
Tel: 416.369.6613
Fax: 416.[illegible].8571
Mobile 416.418.8527
E-mail: jfraser@mcleankerr.com
Web: www.mcleankerr.com

Schultz, Emily

From: Marcia Swain [mswain@hay.net]
Sent: Tuesday, September 02, 2008 1:21 PM
To: Schultz, Emily
Subject: grand bend sewage treatment facility expansion and uprgrade

Hello, has a public meeting been held on this? I would like to know what the expected costs to our commercial property will be. I know you are busy so please advise on the best way for me to get information on the impact this will have on us and the expected timeline.

Thank you
Marcia Swain
Pinery Antique Flea Market
519 238 8382

EAS

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER
BAYFIELD · HAY · HENSALL · STANLEY · ZURICH
2001

RECEIVED
AUG 0 6 2[illegible]
DILLON, LONDON

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: ROGER HOWARD - c/o RICE DEVELOPMENT.

Address and Postal Code: 17 DEAN STREET
BRAMPTON, ONTARIO, L6W 1M7

Telephone: 905.796.3030 **Fax:** 905.796.6360

E-mail: roger@ricedevelopment.ca

Comments:
PLEASE SEE ATTACHED.

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

RICE
development

July 30th, 2008

Ms. Emily Schulz
Planner
DILLON CONSULTING LIMITED
130 Dufferin Avenue, Suite #1400
London, Ontario
N6A 5R2

Dear Ms. Schulz:

RE: GRAND BEND SEWAGE TREATMENT PLANT EXPANSION CLASS EA

We are the owners of approximately 50 acres of land on the north side of Highway #81 in the Municipality of Lambton Shores, as highlighted on the attached plan. The lands are zoned for a mix of residential and commercial development and subject to a current plan of subdivision application as well as a further rezoning application to make some minor adjustments to various zoning boundaries.

As part of the subdivision process, Council allocated 120 m3 of sewage flows to our lands for a two year period, ending in September, 2008, subject to us commencing servicing the lands by that date.

It is probable now that we will not be able to meet that target date and may, therefore, lose that allocation.

We understand that the new plant is scheduled for operation in 2012, at which time capacity would be available for our lands. If we lose the current 120 m3 allocated to the site, is there any other capacity that may be made available in the interim years, before the new plant is operational?

With respect to the alternative Plant designs, we concur that Alternative 3 provides the greatest flexibility and opportunity for the operating municipalities. Our concern would be the additional cost of Alternative 3, the reflection of that cost in any development charge increases, and the viability of the Grand Bend market to support those increases. Are any additional details available regarding the projected pass-thru costs?

17 Dean Street, Brampton, Ontario L6W 1M7 • Tel: (905) 796-3630 • Fax: (905) 796-6360

Thank you for the opportunity to comment on this important issue. We look forward to receiving your response in due course.

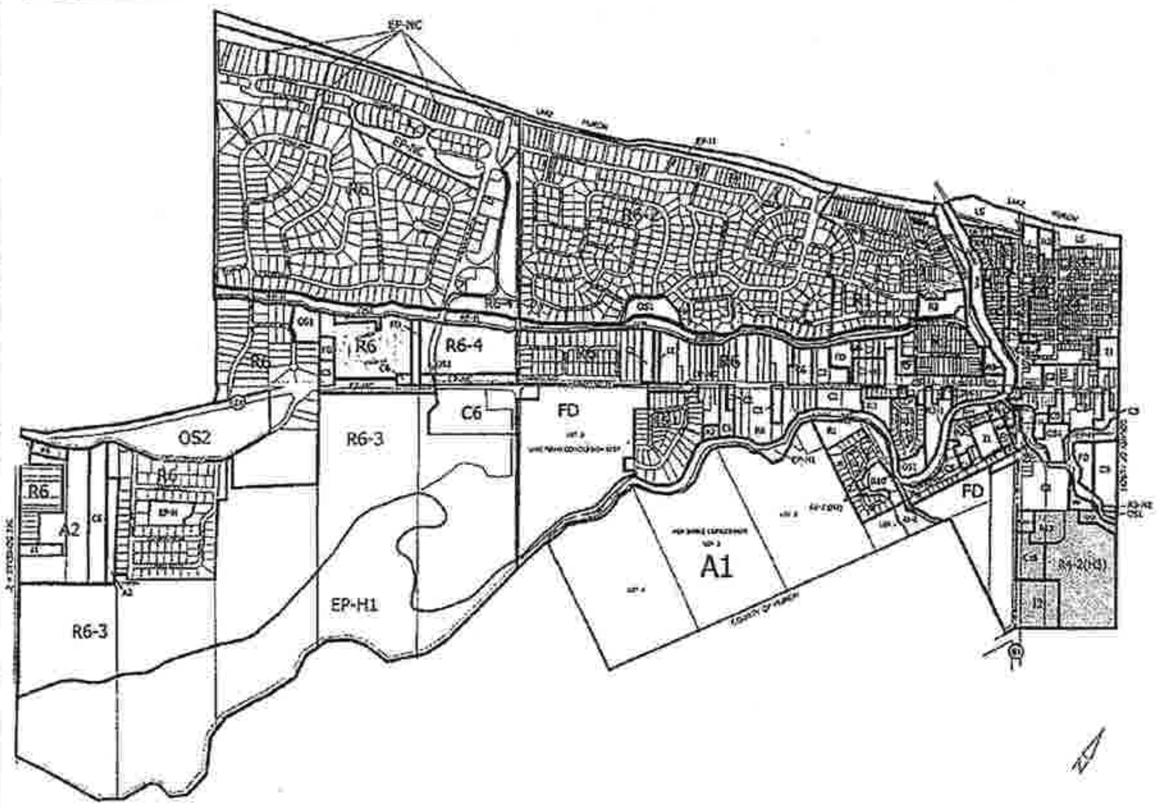
Yours truly,

RICE DEVELOPMENT COMPANY INC.

Roger Howard

Roger Howard

encl.



MUNICIPALITY OF LAMBTON SHORES
SCHEDULE "A-1" (GRAND BEND)
TO BY-LAW NO. ____ OF 2003

PASSED THIS __ DAY OF ____________, 2003

J.C. IVEY, MAYOR   CAROL McKENZIE, CLERK

LEGEND

SYMBOL	ZONE
A1	AGRICULTURAL - 1
A2	AGRICULTURAL - 2
C2	COMMERCIAL - 2
C3	COMMERCIAL - 3
C5	COMMERCIAL - 5
C6	COMMERCIAL - 6
C7	COMMERCIAL - 7
C9	COMMERCIAL - 9
C10	COMMERCIAL - 10
C16	COMMERCIAL - 16
EP-H	ENVIRONMENTAL PROTECTION - HAZARD
EP-NC	ENVIRONMENTAL PROTECTION - NATURAL CONSERVATION
FD	FUTURE DEVELOPMENT
HB	HARBOUR
I1	INSTITUTIONAL - 1
I2	INSTITUTIONAL - 2
LS	LAKESHORE
OS1	OPEN SPACE - 1
OS2	OPEN SPACE - 2
R1	RESIDENTIAL - 1
R3	RESIDENTIAL - 3
R4	RESIDENTIAL - 4
R6	RESIDENTIAL - 6
R10	RESIDENTIAL - 10
R13	RESIDENTIAL - 13
-H1,-H2..	HOLDING PROVISIONS
-1,-2,..	EXCEPTIONS

SCALE: 100 0 100 200 400 METRES

PREPARED BY:
COUNTY OF LAMBTON
PLANNING AND DEVELOPMENT DEPARTMENT
FEBRUARY, 2003

782777 Ontario Ltd.
Tru Land Developments Inc.

100-4747 Pleasant Place, Windsor, ON N8Y 3B3
Office 519-252-1017 Fax 519-252-1018

Sharen Realty GMAC
51 Ontario Street South
Grand Bend, ON
N0M 1T0
(519) 738-2303
Attention: Bob Sharen

Re: Grand Bend Sewage Treatment Facility Expansion & Upgrade (STF)
Class Environmental Assessment (EA) and Preliminary Design

Bob,

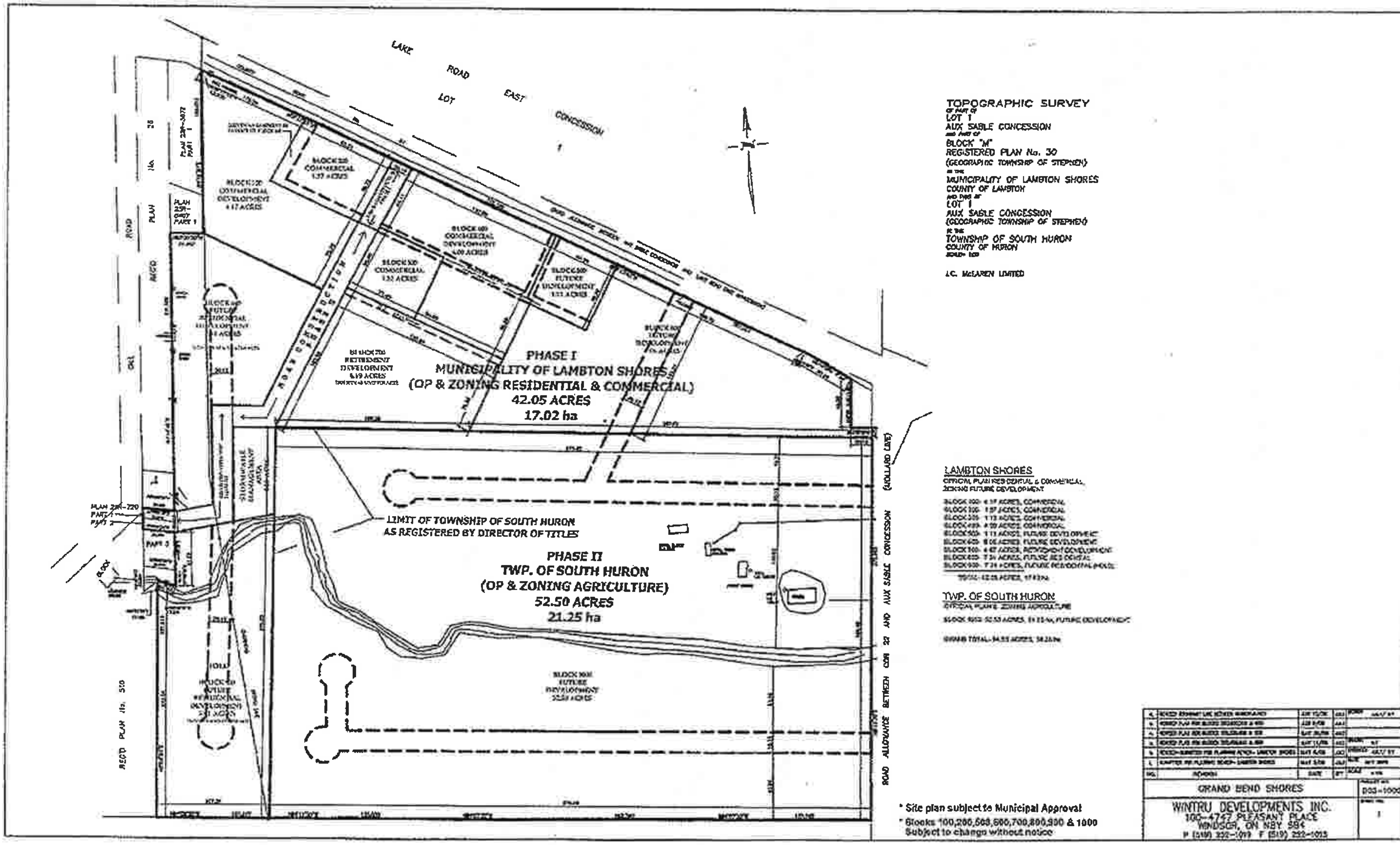
782777 Ontario Ltd., authorizes you to attend the public meeting, July 15th 2008 for *Grand Bend Sewage Treatment Facility Expansion & Upgrade (STF), Class Environmental Assessment (EA) and Preliminary Design* for the Pollock/Duncan lands (42.05 Acres) fronting the south side of Highway 81, **Municipality of Lambton Shores** & west side of Mollard Line, **Township of Huron South** (52.50 Acres).

The reason for your attendance at this meeting is to ensure that all of our development lands (Municipality of Lambton Shores & Township of South Huron) are included in the design study areas (EA) for the expansion and upgrade of the Grand Bend Sewage Treatment Facility. (Boundary plan attached)

Best Regards,

J. Murray Troup
President

Cc: Rick Spencer, HGS Ltd.
Peggy Van Mierlo-West, Director of Community Services, Lambton Shores
Janet Smolders, MCIP, Dillon Consulting Limited


LAKE ROAD EAST CONCESSION
LOT
TOPOGRAPHIC SURVEY
LOT 1
AUX SABLE CONCESSION
BLOCK "M"
REGISTERED PLAN No. 30
(GEOGRAPHIC TOWNSHIP OF STEPHEN)
MUNICIPALITY OF LAMBTON SHORES
COUNTY OF LAMBTON
LOT 1
AUX SABLE CONCESSION
(GEOGRAPHIC TOWNSHIP OF STEPHEN)
TOWNSHIP OF SOUTH HURON
COUNTY OF HURON
J.C. McLAREN LIMITED
PHASE I
MUNICIPALITY OF LAMBTON SHORES
(OP & ZONING RESIDENTIAL & COMMERCIAL)
42.05 ACRES
17.02 ha
LIMIT OF TOWNSHIP OF SOUTH HURON
AS REGISTERED BY DIRECTOR OF TITLES
PHASE II
TWP. OF SOUTH HURON
(OP & ZONING AGRICULTURE)
52.50 ACRES
21.25 ha
ROAD CONSTRUCTION
STORMWATER MANAGEMENT AREA
REG'D PLAN No. 28
REG'D PLAN No. 510
PLAN 23R-3072 PART 1
PLAN 23R-720 PART 1 PART 2
PART 3
ROAD ALLOWANCE BETWEEN CON 22 AND AUX SABLE CONCESSION (HOLLARD LINE)
LAMBTON SHORES
TWP. OF SOUTH HURON
* Site plan subject to Municipal Approval
* Blocks 100,200,500,600,700,800,900 & 1000
Subject to change without notice
GRAND BEND SHORES
WINTRU DEVELOPMENTS INC.
100-4747 PLEASANT PLACE
WINDSOR, ON N8Y 5B4
D03-1000

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: Dan Gill

Address and Postal Code: RR#3 Parkhill Ont.
N0M2K0

Telephone: 519-238-5871 **Fax:**

E-mail:

Comments: Fully Endorse Recomendation 3.
Would like to see odor reduced as much as possible. If tankage needs to be covered please consider this to reduce odour.

Landowner of Pt Lots 6+7 Conc 22. Stephen Twp.

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: HARLIE JOHNSTON

Address and Postal Code: 71319 ELM ST
BLUEWATER ON N0M 1N0

Telephone: 519 238-2843 **Fax:**

E-mail: harliejohnston@gmail.com (already listed)

Comments: - THE RECOMMENDED ALTERNATIVE 3, MECHANICAL TREATMENT UPGRADE WITH SUSTAINABLE DESIGN CONCEPTS AND INNOVATIVE DESIGN FEATURES DESPITE ITS HIGHER COSTS SHOULD BE SELECTED BECAUSE OF IT'S SMALLER IMPACT ON LANDUSE AND IT'S ABILITY TO CONTROL A WIDER RANGE OF POLLUTANTS.

- PHASING OF THE PROJECT SHOULD ALLOW CAPITAL COSTS TO BE DEFFERED FOR THE AREAS NOT YET SERVICED

- COULD ONE KNOW WHEN THE EA WILL START FOR THE SOUTH HURON AND BLUEWATER SERVICE AREAS?

- PLEASE PUT THE ELEMENTS OF THE 20 YEAR PLAN IN A TABLE AND EMAIL OR POST IT WITH PROGRESS INDICATED REGULARILY

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

Schultz, Emily

From:	Schultz, Emily
Sent:	Thursday, July 24, 2008 11:26 AM
To:	'harliejohnston@gmail.com'
Cc:	Smolders, Janet; 'Peggy Van Mierlo West'
Subject:	FW: Grand Bend STF EA and Preliminary Design
Attachments:	PIC Comment Form.pdf; PIC Notice Dashwood.pdf; PIC boards 0715 FINAL.pdf

Good Morning Mr. Johnston,

Attached please find a PDF version of the notice advertising the upcoming Public Information Centre (PIC) for the Grand Bend STF Upgrade & Expansion project. The PIC will be held at the Dashwood Memorial Community Centre on August 16, 2008. A copy of the material presented at the PIC held on July 15, 2008, at the Grand Bend Public School for the project is also attached. The information presented on August 16 will be the same as at the PIC held earlier this month. I have also attached a comment form requesting comments by September 2, 2008. Please re-distribute as appropriate.

Your name has been added to the Contact List for this project. As requested, I have also added the Bluewater Shoreline Residents' Association to our Contact List.

If you have any additional comments, questions or concerns, please do not hesitate to contact me.

Sincerely,

Emily Schultz

Emily A. Schultz
Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, ON N6A 4W7
T: 519-438-6192, Ext. 1315
F: 519-672-8209
eschultz@dillon.ca

From: Smolders, Janet
Sent: Monday, July 14, 2008 9:33 AM
To: Schultz, Emily
Subject: FW: Grand Bend STF EA and Preliminary Design

From: Harlie Johnston [mailto:harliejohnston@gmail.com]
Sent: Thursday, July 10, 2008 11:52 PM
To: Smolders, Janet; Peggy Van Mierlo-West
Cc: paul Mennill; WR MacDougall
Subject: Re: Grand Bend STF EA and Preliminary Design

The July 9 edition of the Lakeshore Advance had a notice of public meetings on this project.
The message copied below indicates that I would like to be contacted with respect to the project.
I am puzzled that I was not contacted directly with respect to these meetings.

I and my organization provide a link to the many seasonal residents that don't read local newspapers yet are very supportive of the project and keenly interested in its progress. Is there a digital copy of the notice available. I would like to re-distribute it as appropriate.

Regards, Harlie Johnston

----- Original Message -----
From: Harlie Johnston
To: Janet Smolders ; Peggy Van Mierlo-West
Cc: paul Mennill
Sent: Sunday, February 17, 2008 9:53 AM
Subject: Grand Bend STF EA and Preliminary Design - Project Initiation Notice

Per the notice in the Lakeshore Advance February 6, 2006.

Please add me to the project contact list. I should be on the list from the February 2006 review.

My address is:

Harlie Johnston
71319 Elm St
GMB 1 RR 1
Dashwood ON N0M 1N0

519 238-2843

I prefer to be contacted by email and to receive documents in digital format at
harliejohnston@gmail.com

You may also consider me a contact for the Bluewater Shoreline Residents' Association (BSRA).
BSRA is an umbrella organization directly in contact with the lakefront subdivisions from Bayfield south to Port Blake.
Directly and through BSRA our member associations from St Joseph to Port Blake want to participate as much as possible.

Harlie Johnston

Schultz, Emily

From: Walter Kratz [wkratz@hay.net]
Sent: Sunday, July 20, 2008 10:22 PM
To: Schultz, Emily
Cc: Paul Turnbull; Peggy Van Mierlo West
Subject: Re: Grand Bend STF Expansion & Upgrade - feedback
Follow Up Flag: Follow up
Flag Status: Red

Ms. Schultz

After reviewing the presentation dated for July 15 th, it prompts one question. Slide 17 indicates that there are 3 phases to the expansion of the Grand Bend STF. How does the timeline for the upgrade to the Grand Bend STF relate to the upgrade of the collection facilities of the various zones and increased capacity requirements ? Other than this clarification, I take no issue with your proposal.

I have two suggestions on the content of your presentation.

1. Since the presentation refers to the "Municipal Class EA requirements for a Schedule "C" project a footnote to your document should provide a web address in the public domain were this information can be found.
2. It would be helpful to include a Glossary of terms at the end of your document to explain the many acronyms used in this presentation. Admittedly, most acronyms show the expanded form in some location in the document.

Regards

Walter Kratz
P.O. Box 1402
Grand Bend, Ontario
NOM ITO
E-mail: wkratz@hay.net
Phone: 519-238-1168 FAX: 519-238-6106

----- Original Message -----
From: Schultz, Emily
To: Walter Kratz
Cc: Tasfi, Louis ; Smolders, Janet ; McKillop, Marcy ; Peggy Van Mierlo West ; Paul Turnbull
Sent: Friday, July 18, 2008 3:04 PM
Subject: RE: Grand Bend STF - Expansion & Upgrade

Good Afternoon Mr. Kratz,

The electronic version of the most recent Grand Bend Sewage Treatment Facility (STF) presentation is now available from the Lambton Shores web site at http://www.lambtonshores.ca/living//index.htm.

The Municipality has initiated the Class Environmental Assessment (EA) process for the South Grand Bend 'Zone 3' Sanitary Sewage Collection System project. A Public Information Centre (PIC) will be held in September (date to be announced) to provide information about alternatives related to the design of the collection system being proposed. A separate EA for the Zone 3 project is being carried concurrent to the

Schultz, Emily

From: Schultz, Emily
Sent: Friday, July 18, 2008 3:05 PM
To: 'Walter Kratz'
Cc: Tasfi, Louis; Smolders, Janet; McKillop, Marcy; 'Peggy Van Mierlo West'; 'Paul Turnbull'
Subject: RE: Grand Bend STF - Expansion & Upgrade

Good Afternoon Mr. Kratz,

The electronic version of the most recent Grand Bend Sewage Treatment Facility (STF) presentation is now available from the Lambton Shores web site at http://www.lambtonshores.ca/living//index.htm.

The Municipality has initiated the Class Environmental Assessment (EA) process for the South Grand Bend 'Zone 3' Sanitary Sewage Collection System project. A Public Information Centre (PIC) will be held in September (date to be announced) to provide information about alternatives related to the design of the collection system being proposed. A separate EA for the Zone 3 project is being carried concurrent to the proposed STF expansion and upgrade project, with both expected to be submitted for 30-day public and agency review at the end of 2008. A more detailed timeline for the project is expected to be available following the completion of the Class EA process.

Your name has been added to the Contact List for both of these projects. A notice will be sent in advance of the September PIC for the Zone 3 project.

Thank you for your input and we look forward to your comments.

Sincerely,

Emily

Emily A. Schultz
Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, ON N6A 4W7
T: 519-438-6192, Ext. 1315
F: 519-672-8209
eschultz@dillon.ca

From: Walter Kratz [mailto:wkratz@hay.net]
Sent: Wednesday, July 16, 2008 11:30 AM
To: Schultz, Emily
Cc: Mr. Paul Turnbull
Subject: Grand Bend STF - Expansion & Upgrade

Ms. Schultz

Please advise when the electronic version of the most recent Grand Bend Sewage Treatment Facility (STF) presentation will be available from the Lambton Shores web site. I will provide feedback about the presentation after I have had an opportunity to review it once more.

On the larger topic of sewage treatment, I would appreciate a document (Critical Path Method - chart) that provides the timelines and various milestones for all of the known components of this very large project. For instance, it would be of interest to know the timing of the various upgrades to the STF and how they coincide with the building of sewage collection systems. Presumably, there are also milestones for the planning events. Of particular interest is the planned interval between release of planning for collection systems and the decision making process for Lambton Shores Council to select a system.

I am a resident of Southcott Pines subdivision. I am also interested in any available information about the sewage collection system and the sewer mains that this system will connect to. It would be helpful to know for future reference, the schedule for the "Zone 3" part of the project.

Thank you in advance for any or all of the requested information that you are able to provide.

Regards

P.S. Electronic information is preferred.

Walter Kratz
P.O. Box 1402
Grand Bend, Ontario
N0M 1T0
E-mail: wkratz@hay.net
Phone: 519-238-1168 FAX: 519-238-6106

July 24, 2008

Emily Schultz
Planner
Dillon Consulting Limited
130 Dufferin Ave., Suite 1400
LONDON, ON
N6A 5R2

Fax 519-672-8209

Re: Public Information Centre, Tuesday, July 15, 2008

I had the pleasure of attending the Public Information Centre at Grand Bend on July 15, 2008. I was taken aback by statements made by the M.M. Dillon representatives that the S.T.F. was **not** to include a "septage" handling system.

If all the sewage effluent in the suggested areas of Lambton Shores/Bluewater is handled by the S.T.F.; what of the myriad of septic tanks outside the specific area?? To omit a "septage" handling capability is, in my mind, gross negligence.

Frank E. Loscombe
10330 Dogwood Crescent
Grand Bend, On
N0M 1T0
519-238-5942

PAGE 1 OF 1

Lambton Shores — MUNICIPALITY OF SOUTH HURON — MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

TO MUNICIPACITY OF BLUEWATER

Record of Comments, Public Information Centre
Saturday, August 16, 2008

Name: JOHN MASON

Address and Postal Code: 168 MELEN ST DASHWOOD ON "CANADA"

Telephone: 232-3801 **Fax:**

E-mail:

Comments: YOU CAN'T RUN YOU CAN'T HIDE WHAT A STATEMENT TO MAKE BY A NOW ELECTED OFFICAL. WHY CAN'T THE BLUEWATER MUNICIPALITY SEE THAT THE OTHER TWO MUNICIPACITYS TO THE SOUTH ARE BULLY'S. THE PAPER READ'S SOUTH HURON'S IN IF BLUEWATERS IN! SOUTH HURON WAS IN ALREADY THEY OWED THE LAGOON. TALK ABOUT DICTATORSHIP. BLUEWATER COUNCIL TAKE BACK YOUR PRIDE AND GET OUT NOW BEFORE WE ALL GET CAUGHT UP IN SOMETHING WE CAN NOT REVERSE. TO PUT 8,000 PEOPLE ON A ELECTRIC SEWAGE SYSTEM IS "JURASIC" TO ME. THE GOOD BOOK SAY'S THE MEAK SHALL INHERIT THE EARTH! WHERE ARE THE MEAK GOING TO LIVE.

John Mason

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

TO DILLON'S

PAGE 1 OF 2

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Saturday, August 16, 2008

Name: John MASON

Address and Postal Code: 168 HELEN ST DASHWOOD ON.
"CANADA"

Telephone: 237 3801 Fax:

E-mail:

Comments: GLAD TO SEE THAT THE POWERS TO BE ADMIT THAT LAGOONS HURT THE ENVIRONMENT. JUST THINK HOW MUCH MORE THE LAGOON IN GRAND BEND AND THE NEW TREATMENT PLANT THAT IS PROPOSED HURT THE ENVIRONMENT WHEN YOU ADD ANOTHER 9,000 PEOPLE TO THE SYSTEM. I NOTICE THAT ALL THE TREATMENT PLANTS THAT ARE ALL IN SERVICE NOW ARE ALL BEEN UPGRADED ALSO MEANING THEY ALL MUST HAVE BEEN POLUTING THE WATER ALSO. PLEASE STAY OUT OF DASHWOOD. AT LEAST WE PUT

NEXT PAGE

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

To DILLON'S

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

PAGE 2 OF 2

Record of Comments, Public Information Centre
Saturday, August 16, 2008

Name: John MASON

Address and Postal Code: 168 McLEAN ST DASHWOOD ON "CANADA"

Telephone: ___ Fax: ___

E-mail: ___

Comments: OUR WASTE WATER BACK INTO THE GROUND SO THAT THE MILLIONS OF CRITTERS THAT KEEP US AT THE TOP OF THE FOOD CHAIN CAN have A DRINK. FOR WITHOUT THEM WE ARE NOTHING. FORTY YEARS AGO WHILE Swimmig IN THE CREEK MY LITTLE BROTHER AND I OBSERED THE CATTLE going FOR A DRINK AND MOST WOULD EXPEL THERE MOURNING MEAL INTO THE WATER. I SAID THE CATTLE ARE NOT SMART ENOUGH TO NOT DO THIS. Look's Like TO ME WE DON'T NO ENOUGH EITHER.

John Mason

Please return this form by September 2, 2008 to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

Lambton Shores — Municipality of South Huron — Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: W. David McClure,

Address and Postal Code: 9923 Pinery Lane, Huron Woods, RR# 2 Box 59, Grand Bend, Ontario. N0M 1T0

Telephone: 519 238 8449 **Fax:** 519 238 8449

E-mail: Canadave @ hay.net

Comments:

To what extent will the plant be able to extract certain heavy metals and metallic compounds dissolved or mechanically suspended in the raw sewage?

To what extent has consideration been made towards treating the solids and sludges so that they can safely be used as nursery soil, potting soils and solid fertilizer for farmland?

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

ZONE 3

Lambton Shores
MUNICIPALITY OF SOUTH HURON
MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre Saturday, August 16, 2008

Name: DONNA & JOHN McCREA

Address and Postal Code: 26 BUTTONWOOD DR KITCHENER N2M 4R1

Telephone: 519-745-6529 **Fax:** 519-745-2914

E-mail: johnmccrea@rogers.com

Comments: RE: 10366 BREWSTER BLVD N, SOUTHCOTT PINES. WE DO NOT WANT THE SEWERS. WE FEEL THAT NOT ONLY IS THE SEWER SYSTEM AN EXPENSIVE UNDERTAKING, ESPECIALLY FOR A NUMBER OF SENIOR CITIZENS ON FIXED INCOMES, WHO LIVE IN THE AREA, BUT ALSO UNNECESSARY. THERE IS NO PROOF THAT GROUND WATER DISCHARGE FROM SEPTIC SYSTEMS, ESPECIALLY IN THIS AREA, IS RESPONSIBLE FOR POLUTING LAKE HURON. THE POLUTION IS A DIRECT RESULT OF RUNOFF FROM STREAMS & RIVERS. WE KNOW THE MAJORITY OF RESIDENTS DO NOT WANT OR FEEL THEY NEED SEWERS AND LAMBTON SHORES SHOULD STOP THIS PROJECT NOW AND CUT THEIR LOSSES. THIS IS A WASTE OF TAXPAYERS' DOLLARS.

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

Lambton Shores

MUNICIPALITY OF SOUTH HURON

MUNICIPALITY OF BLUEWATER 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: Kim and Angela McLean

Address and Postal Code: 82 John Street St. E., Box 1903
Exeter ON NOM 1S7

Telephone: 519-235-1310/238-5111 **Fax:** 519-235-2234

E-mail: angel48@sympatico.ca/ raymclea@quadro.net

Comments: We own cottage property, where we spend six months
months of the year, located at 33908 Ridgeway Road
R. R. #1 Dashwood ON. We are both in favour of
the proposed expansion and upgrade of the Grand
Bend STF.

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

ZONE 3

Schultz, Emily

From: Marilyn Pollard [mpollard@ciaccess.com]
Sent: Thursday, August 28, 2008 10:34 PM
To: Schultz, Emily
Subject: grandbendstf

614 Sandra Crescent,
Wallaceburg, Ontario,
N8A 2C6

Dillon Consulting Limited
Attn: Emily Schultz, Planner
Box 426 London, Ontario,
N6A 4W7

August 28, 2008

Dear Ms. Schultz,

We live in Southcott Pines. We are concerned about the grinder pump, low pressure sewer system that Dillon is recommending for Southcott Pines subdivision.

The Master Plan report indicates much higher servicing costs over standard gravity system.

The north end of Southcott Pines is having a gravity system which has the same terrain as the south end. Why can't the south end of Southcott Pines have a gravity system also?

We are concerned that Dillon is proceeding with preliminary design for a system that may not be the best system for Southcott Pines.

Some of the questions that we have about the grinder pump system are as follows:

1. Does the maintenance cost estimate in the Dillon report for the low pressure system include the homeowner's maintenance costs for each pump?
2. What is the cost of a grinder pump and the installation for each homeowner?
3. What will be the additional cost of pump maintenance to homeowner?
4. The cost of hydro hookup for a grinder pump?
5. What about hydro failure?
6. What if the alarm goes off and the homeowner is away for an extended period of time?
7. What is the extra cost for a gravity system for Southcott Pines versus a grinder pump, low pressure system? The Dillon report did not adequately address this.
8. What would the maintenance cost be for a gravity system for Southcott Pines versus a grinder pump low pressure system? The Dillon report indicates that the gravity system would cost less than the grinder pump, low pressure system. The gravity system may be the long term preferred and most beneficial system for Southcott Pines.
9. What is the availability of pumps and qualified installers in the Grand Bend Area?

10. Are the pumps made in Canada?
11. Pump warrantees? Estimated life of the pumps?
12. Are there examples of systems that have been in operation for 10 years or more in Southwestern Ontario? (Similar climate)
13. Would central pumping stations for the gravity system not be much more economical to install, maintain and have less power consumption than 400 grinder pumps?
14. All upgrades, expansions and improvements to the Grand Bend STF should include a dumping station to receive septic tank waste.
15. What Government grants are available?
16. The Dillon report does not indicate how alternate proposed systems outlined in the report are evaluated. How are they evaluated and who does the evaluations?
17. Why do you recommend the grinder pump installation for Southcott Pines subdivision?

We prefer a gravity sewer installation for Southcott Pines subdivision..

Yours truly,

Marilyn and Bob Pollard
mpollard@ciaccess.com

EAS

Lambton Shores
MUNICIPALITY OF SOUTH HURON
MUNICIPALITY OF BLUEWATER
BAYFIELD - HAY - HENSALL - STANLEY - ZURICH
2001

**GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN**

**Record of Comments, Public Information Centre
Tuesday, July 15, 2008**

Name: JACK POWELL

Address and Postal Code: G.M.B. # 425
RR#2 ZURICH, ONT N0M 2T0

Telephone: 519-236-4019 **Fax:**

E-mail: jpowell@porchlight.ca

Comments:

WOULD YOU PLEASE SEND A COPY OF THE GRAND BEND + AREA SANITARY SEWAGE MASTER PLAN (FEBRUARY 2006) TO THE ABOVE ADDRESS.

THANK YOU
JACK POWELL

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

Smolders, Janet

From: Peggy Van Mierlo-West [pvmwest@lambtonshores.ca]
Sent: Thursday, July 17, 2008 4:28 PM
To: ppedersen@hay.net; Smolders, Janet
Subject: RE: Grand Bend STF

Thanks Pete for you comments. Dillon will be reviewing these concerns and contact you in a timely manner.

Regards,

Peggy Van Mierlo-West
Director of Community Services
9575 Port Franks Road
Thedford, ON
N0M 1J0

Phone 519-243-1400

Zone 3

From: Pete [mailto:ppedersen@hay.net]
Sent: Thursday, July 17, 2008 4:24 PM
To: jsmolders@dillon.ca
Cc: pvmwest@lambtonshores.ca
Subject: FW: Grand Bend STF

Hello Janet and Peggy

Thank you for hosting the Information Centre on July 15.

Anne and I have a number of comments and questions:

- In the Comparative Evaluation, Option 3 is such a clear winner in all categories except Capital, Operating and Maintenance Costs that one wonders why Alternatives 1 & 2 were even considered. Were there no other alternatives to consider ... such as the system involving UV lights, designed by a company in the London area and deployed in the Windsor-Essex County area with apparent great success? Supposedly, this system is very adaptable and it is very easy and cost-effective to increase capacity.

- Why do you not show the projected costs of Alternatives 1 & 2, so that we can look at both the comparative costs as well?

- Apparently, the $3.2M capital cost for Phase 3 is expressed in today's dollars. It should be expressed in future (20 year) dollars, as well, so that we can perhaps decide whether it is more cost-effective to install full capacity immediately. (We were told that at the time of installation, the current lagoon system could have been upgraded to something like Alternative 3 for less than $2.0M .... which would have been a heck of a bargain compared to today's and future costs.)

- We understand that properly installed and maintained septic systems in areas such as Southcott Pines (sandy soil) are very effective and actually of benefit to the environment, providing water to the local aquifer system to the benefit of existing vegetation. It seems to us that, compared to the capital and operating costs associated with the proposed STF and collection system, it would be considerably less expensive to pass by-laws providing for municipal standards and inspections and to hire an inspector(s) to do so and to enforce maintenance standards.

Although the Collection System is not part of the current review and report, we have the following concerns / questions / comments:

- We understand that the Ontario government stipulates that all water treatment and operating costs can only be recovered through water rates. Does this mean that until one's home is actually hooked up to the new sewage system, that there is no cost to be reflected in property taxes or fresh water rates? No Collection - No Cost?

- We have heard that in Bayfield, homes are being connected directly to the collection system without a reservoir (45 gallon drum) at the residence. Should there not be a requirement for a reservoir, to allow for operation when power is out? There was a four hour outage in parts of Southcott Pines this morning. In such circumstances, one would apparently not be able to use or flush waste water.

- We have also heard there may be restrictions on the use of existing septic tanks as reservoirs. Why?

- We have heard that the residential grinder / pressure pumps are about $1,400, and are subject to failure. Where would these pumps be installed, in relation to the system / reservoir. If in the home, they could be accessed with reasonable ease. (We also understand there are none in local inventory and they take several days to receive ----- great fun!) If they are installed in the reservoir (drum or septic tank) there is a more difficult exchange process as well as additional installation costs for electrical, provision for access, etc.

- We understand that when the last sewer system was installed, if home-owners opted to pay for the hook-up over time, through their taxes, there was no option available to pay out the balance at any point .... because the financing negotiated by the municipality did not provide for lump sum payments or payouts. Is the municipality aware of the importance of providing that opportunity to residents?

Yours truly,

Pete & Anne Pedersen
P.O. Box 278
10343 Grand Oaks Drive
Grand Bend, ON N0M 1T0

Phone: 519-238-6810
Cell (Pete): 416-464-9108
Office (Pete: 519-238-8288
Toll Free (Pete): 800-478-0529 (Emergency only)
Fax: 519-238-6861

Lambton Shores | Municipality of South Huron | Municipality of Bluewater 2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Saturday, August 16, 2008

Name: JOHN DOUGLAS SCOTT

Address and Postal Code: 64 Leland PLACE
LONDON, ONT N6A 4K3.

Telephone: 519-472-1219 **Fax:**

E-mail: jdmscott@sympatico.ca

Comments:
I have been an owner of a Cottage in the Southcott Pines Subdivision (10329 CHRISTIE Street) June 1976. THE SANITARY SEWER issue has come to my attention and I question why do SANITARY SEWERS have to go into Southcott Pines! We ARE ON A SAND BASE - TO my Knowledge there is NO Leeching of Effluent into the Lake or River - Septic tanks are Working fine - Is this a "CASH GRAB" by the MUNICIPALITY. I understand that NORTH of GRAND BEND THERE IS A (odor).

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

cc: Municipality of Lambton Shores
P.O. Box 340
Grand Bend, Ont.
N0M-1T0

clay BASE - which might cause issues - but NOT in Southcott Pines.

- WHAT IS THE COST? - Both public & PRIVATE?
- THE INFO I have been able to gather is a cost of $26,000 per lot in EASTWOOD. But this is only an estimate and does NOT include the PRIVATE cost for lines / pumps / grinders / decommissioning the Existing Septic tank. Is this correct?
- Is this a developer / politically motivated issue??
- When you get into specifics I understand there was put forth a reccomendation for an electric "grinder system" with a pump for each household, if a septic tank was decommissioned. Is this correct? If so, what happens if the hydro shuts down? Grand Bend is known to have hydro failures. No grind - No pump - SEWAGE backup! - Has this system been used elsewhere in ONTARIO, CANADA or NORTH AMERICA - Please advise so that I can be properly informed on this equipment.
- When will the MUNICIPALITY of LAMBTON SHORES be issuing copies of their evalutions AND ALSO the projected costs for the EXPANSION and upgrade of the GRAND BEND STF
- HAS the ESR. Been placed on the public record for review?
- Does A WEBSITE EXIST for this project?

Yours truly
[illegible] Scott.

Zone 3

MUNICIPALITY OF SOUTH HURON

Lambton Shores

MUNICIPALITY OF BLUEWATER
BAYFIELD · HAY · HENSALL · STANLEY · ZURICH
2001

GRAND BEND SEWAGE TREATMENT FACILITY (STF) EXPANSION & UPGRADE
CLASS ENVIRONMENTAL ASSESSMENT (EA) AND PRELIMINARY DESIGN

Record of Comments, Public Information Centre
Tuesday, July 15, 2008

Name: JANE ST-LAURENT

Address and Postal Code:

Telephone: **Fax:**

E-mail: janostlaurent@sympatico.ca.

Comments:

- list of Ontario municipalities that have installed a low-pressure-grinder pump system such as you are considering for Southcott Pines sub-division.

- please send this to me prior to the Sept. public meeting.

Please return this form by **September 2, 2008** to:

Emily Schultz, Planner
Dillon Consulting Limited
130 Dufferin Avenue, Suite 1400
London, Ontario, N6A 5R2
Telephone: 519-438-6192
Fax: 519-672-8209
Email: eschultz@dillon.ca

Roadhouse, Emily

From: Steven Walper [swalper@sympatico.ca]
Sent: Tuesday, December 09, 2008 10:13 PM
To: Roadhouse, Emily
Cc: Alan Walper
Subject: Re: Grand Bend STF Upgrade

Emily,
I did not receive a response to the letter below. Can you send acknowledgement that you received this letter. Can you provide me with any update as to the status of this project? When will a response be provided?
Thanks,
Steven

----- Original Message -----
From: Steven Walper
To: eschultz@dillon.ca
Cc: Alan Walper
Sent: Saturday, August 30, 2008 9:59 PM
Subject: Grand Bend STF Upgrade

To Emily Schultz
Planner, Dillon Consulting Limited

We have the following comments and questions regarding the Grand Bend STF Environment Assessment & Preliminary Design Report.

First, we are opposed to Alternatives 1 and 2 which propose building new lagoon ponds on adjacent property, lot 5. We will take on legal council to resist purchase proposal or expropriation attempt which is likely thus to increase capital costs for these alternatives if chosen.

It is unfortunate that alternatives considered in this study only address management of sewage system assuming input given, not potential problems at source. Grand Bend and other municipalities continue to subsidize cost of water which encourages wasteful usage, driving thus higher demand for treatment facilities which adds additional costs to municipalities and tax payers. Grand Bend should look first to increase water rates to discourage wasteful usage, encourage use of low flush toilets which could eliminate current need to expand current GB STF.

If expansion is deemed necessary, Alternative 3 is most palatable. Since Grand Bend commercial properties derive benefit from clean attractive beachfront it is unreasonable for the town to discharge poorer quality effluent from Alternatives 1 & 2 (and existing facilities!) which contributes to poor water quality and beach closure.

If it is decided to proceed with Alternative 3, we request that the existing buffer zone as currently applied to lot 5 be removed. We will seek legal advice as to whether precedent exists for compensation to landowners who have had buffer zones imposed on their property.

Regards,
Steven and Alan Walper
Lot 5, Concession 22
RR#3
Parkhill, Ont.
N0M 2K0

Lakeshore Advance

Have your say

Observing outright objections

Understanding sewers

Posted 6 days ago

TO THE EDITOR:

Having read in the Lakeshore Advance Wednesday, Aug. 8 an article entitled Sewage program on target, I would make the following comments: this statement may be true with regard to certain aspects of the project but certainly is not taking into account observations and outright objections to certain aspects of the project.

Mechanical sewage disposal plant without the capability to handle septage in this tri-municipal area is without a doubt a complete lack of foresight and any modicum of intelligence.

To replace well operating and efficient septic systems with a very expensive pump and grinder system does, in my opinion, run contrary to the old adage "If it ain't broke, don't fix it," not to mention the very exorbitant costs to install and maintain.

This option (if it is indeed an option) is without a doubt one of the least intelligent decisions to date.

Putting the pump and grinder system in the Pinery Park is a better idea, where at least Mr. McGuinty and his cohorts will have to pay for it.

Mr. Donald Giberson, South Huron manager, adds injury to insult by telling all and sundry that you can complain and suggest alternatives all you want, but it will be to no avail. "You can delay it, but you cannot stop it."

Mr. Giberson seems to have pass with flying colours 'our way or the highway' 101 but needs a crash course in 'democracy' 101.

The fact that he would even think along these lines let alone say it shows us what we are up against. The fact that people who are hired and paid using taxpayer dollars should have this "in-your-face" attitude and do not hesitate to express it, is to me not only galling but appalling.

Hopefully more public-minded individuals will intervene and listen closely to very concerned citizens. We all did not just fall off the turnip truck!

Frank E. Loscombe

Southcott Pines

Article ID# 1181519

Have your say Articles:

- Wake up- we are being ripped off
- Who wants an election? Not me
- Let's get physical
- Fluoride in water
- Coffee Break hosts needed
- Bryson does good work
- Honest employee; reader
- Fire Chief says thanks
- Thanks for your help OPP
- Love kids; hate disrespect

More Have your say »

Editorials

July 24/08

Sewers will become a reality

Tri municipal

Posted By BY LYNDA HILLMAN-RAPLEY

Posted 2 days ago

Heads are spinning as the infrastructure to live in Ontario soars. Whether it is water lines or sewer hook-ups the pocketbook is getting slimmer as community growth continues.

An open-house for the future sewage treatment facility master plan, last week had tri-municipal representation as well as Dillion ... explaining the process. Picture boards circled the room and questions from those effected were welcome. More than a few people were hot under the collar because of future costs. One man wanted to know why he should pay for development in the south when he lives in the north.

The problem we see though is that you canâ€™t run and hide--or sell and move away because this is the lay of the land. The way to the future. What may have been in the past- one home one washroom is Jurassic. Some folk are using the same old septic systems but have added a couple of washrooms, dishwasher, washing machine etc. That canâ€™t be good. Those with new systems are a whole different thing. And, future development is frozen. No capacity, no development. In actuality, most people want more money spent on water, pipes and sewers -- but not necessarily to pay for it themselves. Most people are concerned about what is needed, they just arenâ€™t willing to pay for it.

Make no mistake though- it may not be tomorrow, but, sewers are coming and that is reality. LHR

Article ID# 1124752

Editorials Articles:

- Fuelish thoughts
- Enjoying your property
- So much for privacy
- Municipal separation

More Editorials »

Local council

July 24/08.

Year end deadline for phase one

Tri-municipal

Posted By BY LYNDA HILLMAN-RAPLEY

Posted 2 days ago

An open-house for the future Grand Bend sewage treatment facility expansion and upgrade was held Tuesday night in Grand Bend. Lambton Shores mayor Gord Minielly said this is a reality and they want Phase Two done by the spring of 2010.

"Future development is frozen without this work," he said at the open house. The mayor also said they can't keep complaining about the lake waters when they are not doing their part.

Phase One is the construction of the force main in the Pinery Park and Phase Two is the actual tri-municipal (Bluewater-Lambton Shores-South Huron) system on Mollard Line, east of Grand Bend. Director of Community Services, Peggy VanMielo West said the final design will be complete by the end of the year. The actual sewers at the homes from the Pinery to St. Joseph will not likely happen until 2012.

The Grand Bend Sewage Treatment Facility currently consists of four stabilization lagoons discharged on a seasonal basis to the Shipka municipal drain and then to Parkhill Creek. The master plan is a comprehensive, long-range document outlining sanitary sewage infrastructure improvements required to service lands in the study area over the next 20 years. The expansion and upgrade of the Grand Bend Sewage Treatment facility was identified as the preferred treatment needs of the study area that will be populated by 10,950 people in Lambton Shores, South Huron and Bluewater. In a public and agency consultation project notice in April 2008, 20 comment forms were received from agencies, local interest groups, ratepayer associations and developers with no significant concerns expressed. Also 160 residents replied to the notice with most requesting to be kept informed. Ten residents approved, based on environmental concerns, and six disapproved due to costs (property owner and municipal costs) and potential impacts of the expanded facility such as noise and odour. Minielly said they are hoping for two-thirds of the costs from upper-tier governments. The open house provided for three alternative concepts with all expansion and upgrade alternatives requiring that sludge in the existinglagoons be removed and treated.

As recommended the top two priority projects currently underway are the Pinery Park and Southbend estates to be serviced in 2009 by the remaining allocated facility capacity. And that the Grand Bend STF expansion and upgrade to be operational by 2012 subject to approvals.

The servicing of the remaining area be confirmed by the three municipalities in subsequent sewage collection system Class environmental Assessments for the existing subdivisions and developments west and south of Southbend estates to the Ausable River cut in Lambton Shores , South Huron from Grand Bend to Huron road 83, including Oakwood Park, the Bluewater lakeshore and Dashwood.

From here the three municipalities will consider all comments received from this open house and the August 16 open house in Dashwood. Based on this input and more detailed evaluations, the three municipalities will select preferred alternatives for expanding and upgrading the facility. They want to complete the Environmental Study Report and following clearance, the project may proceed to design and construction.

Phase three of the process evaluates design options for the expansion and upgrade. It is prepared with input of archaeologsts, terrestrial/aquatic biologists, land use /environmental planners. It ends with a recommended design. During Phase 4 the Environmental Assessment is documented in an ESR placed on the public record for a 30-day review period.

Article ID# 1124637

Ministry of Culture
Culture Programs Unit
Programs & Services Br.
900 Highbury Avenue
London, ON N5Y 1A4
Tel: 519-675-6898
Fax: 519-675-7777
e-mail: shari.prowse@ontario.ca

Ministère de la Culture
Unité des programmes culturels
Direction des programmes et des services
900, av. Highbury
London, ON N5Y 1A4
Tél: 519-675-6898
Téléc: 519-675-7777
e-mail: shari.prowse@ontario.ca

Ontario

December 22, 2008

Ms. Jacqueline Fisher
Fisher Archaeological Consulting
452 Jackson St. W.
Hamilton, Ontario L8P 1N4

RE: Review and Acceptance into the Provincial Register of Reports: Archaeological Assessment Report Entitled, "Grand Bend Sewage Treatment Facility Upgrade and Expansion, Huron County, Ontario, Prepared for the Municipalities of Lambton Shores, South Huron and Bluewater, Stage 1: Archaeological Background Research, Final Report", October 2008, Licence/PIF # P042-152-2008, MCL File 38WS002

Dear Ms. Fisher,

This office has reviewed the above-mentioned report, which has been submitted to this Ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. This review is to ensure that the licensed professional consultant archaeologist has met the terms and conditions of their archaeological licence, that archaeological sites have been identified and documented according to the 1993 technical guidelines set by the Ministry and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario.

As the result of our review, this Ministry accepts the above titled report into the Provincial register of archaeological reports. The report indicates that portions of the subject property as indicated in Figures 3 of the report have archaeological potential and, consequently, should be subject to a Stage 2 assessment prior to any development. This Ministry concurs with this recommendation.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

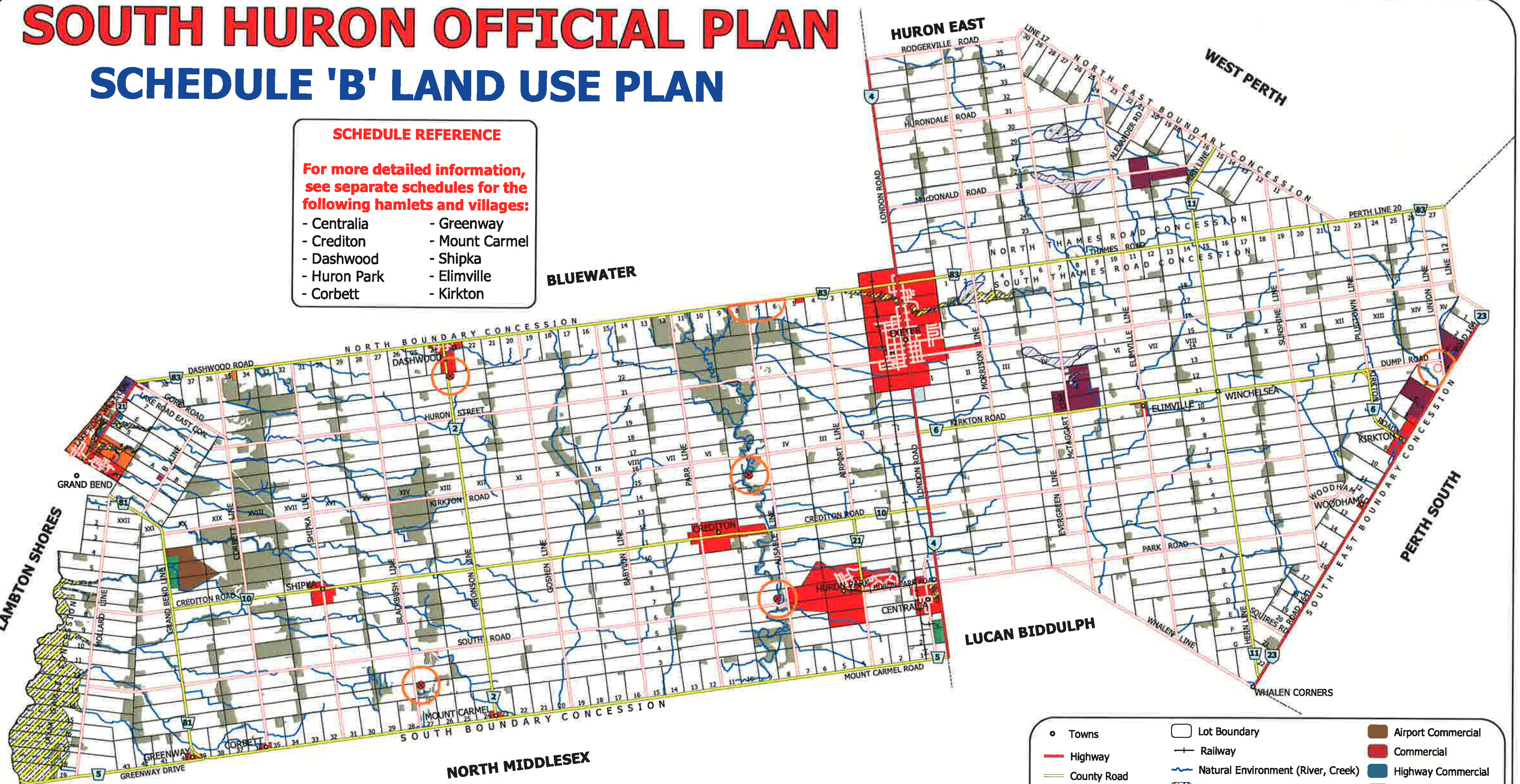
Shari Prowse
Archaeology Review Officer

cc. Archaeology Licence Office
Ms. Janet Smolders, Dillon Consulting Limited

APPENDIX D
OFFICIAL PLAN AND ZONING BY-LAW SCHEDULES

SOUTH HURON OFFICIAL PLAN

SCHEDULE 'B' LAND USE PLAN



SCHEDULE REFERENCE

For more detailed information, see separate schedules for the following hamlets and villages:

- Centralia
- Crediton
- Dashwood
- Huron Park
- Corbett
- Greenway
- Mount Carmel
- Shipka
- Elimville
- Kirkton

Towns
Highway
County Road
Municipal Road
Open Landfill
Closed Landfill
500 m Landfill Buffer
Lot Boundary
Railway
Natural Environment (River, Creek)
Floodplain
Wellhead Protection Zone
Natural Environment
Agriculture
Pits/Quarries
Airport Commercial
Commercial
Highway Commercial
Industrial
Institutional
Recreational
Urban
Urban Developmental

0 2 4 6 Kilometers

1:100,000

N W E S

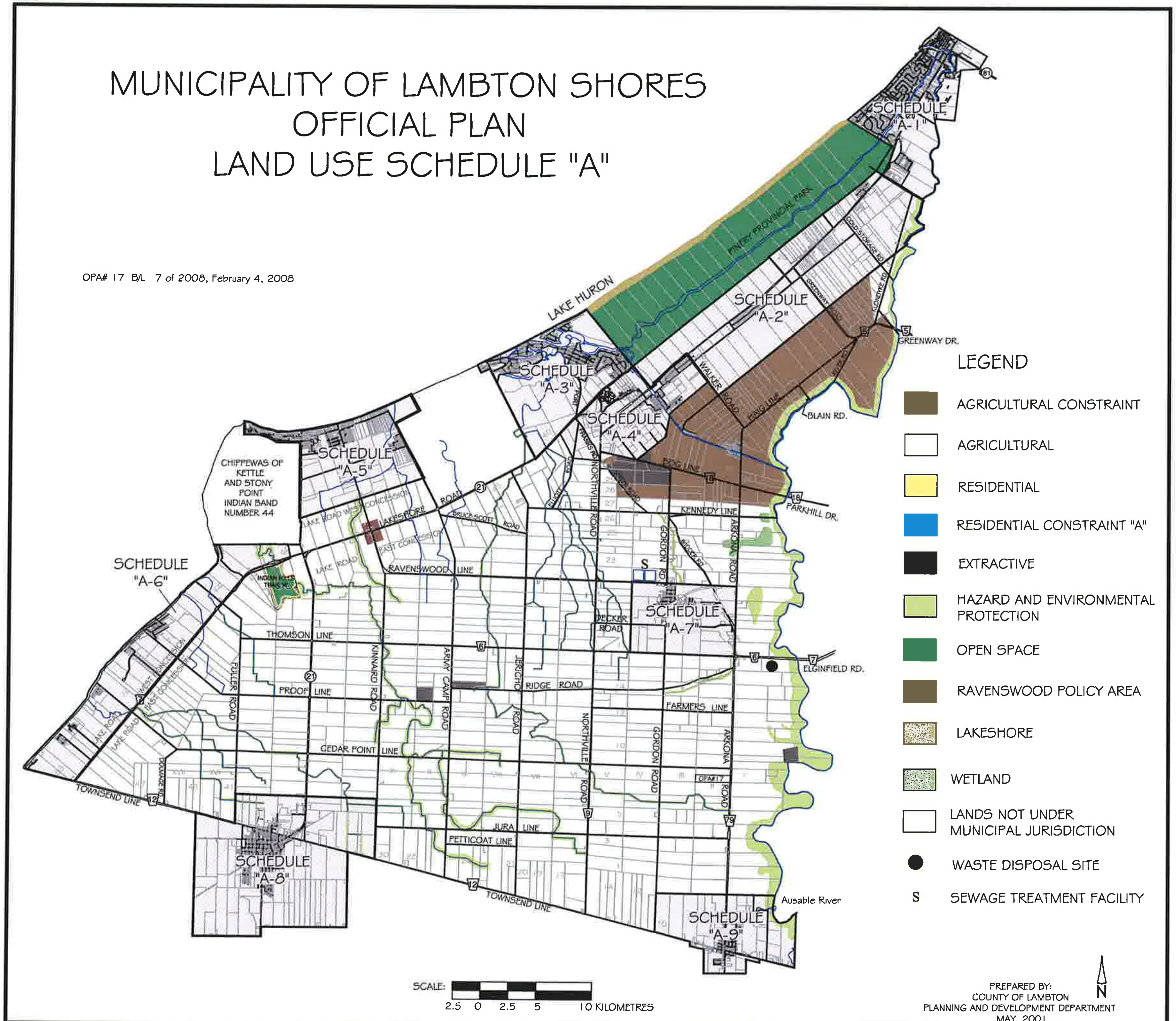
Corporation of the COUNTY of HURON
PLANNING AND DEVELOPMENT DEPARTMENT
Court House, Goderich, Ontario N7A 1M2

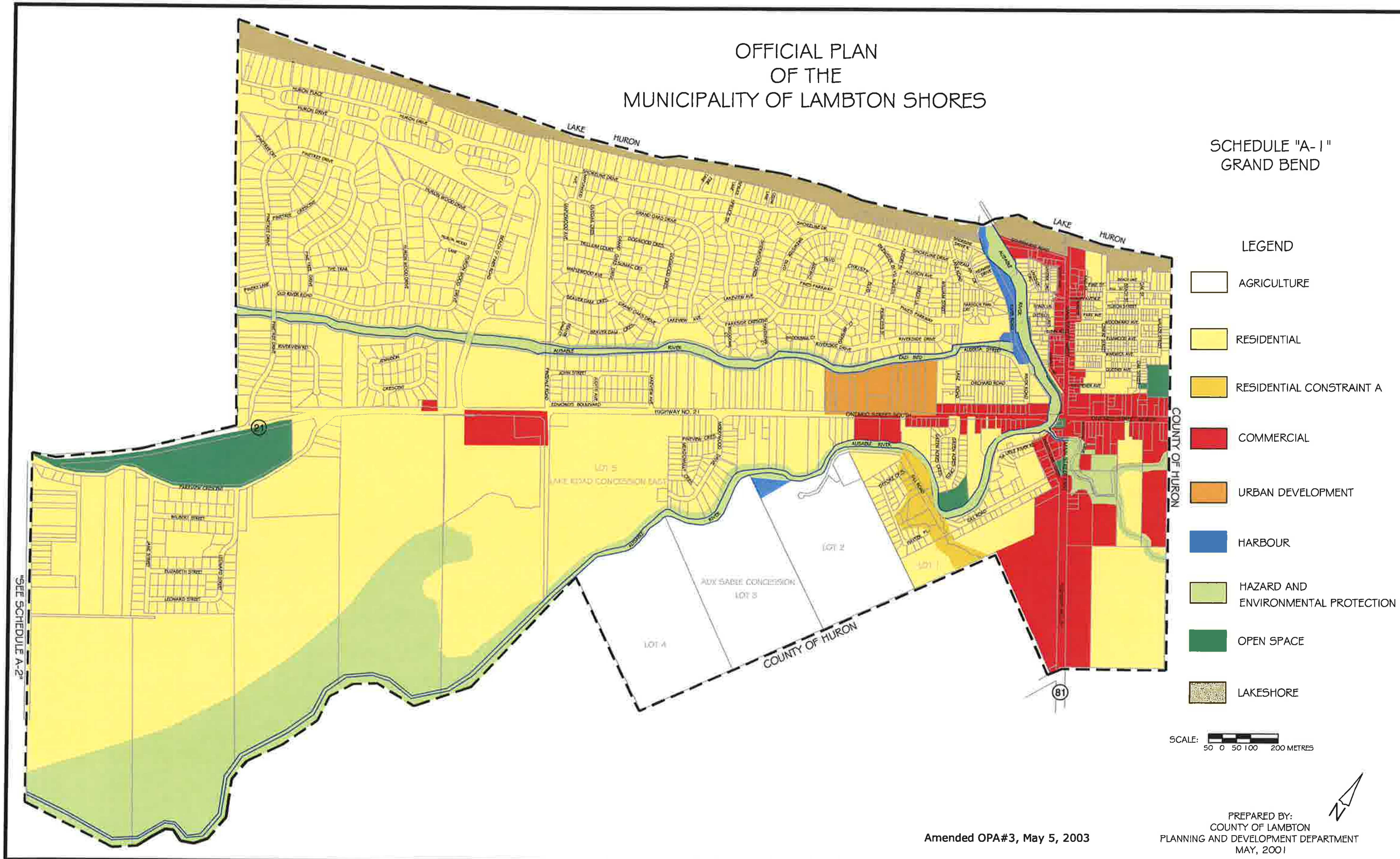
Produced by the County of Huron Planning and Development Department GIS Services with Data supplied under Licence by Members of the Ontario Geospatial Data Exchange, ABCA and MVCA.
This map is illustrative only. Do not rely on it as a precise indicator of routes, feature locations, nor as a guide to navigation.

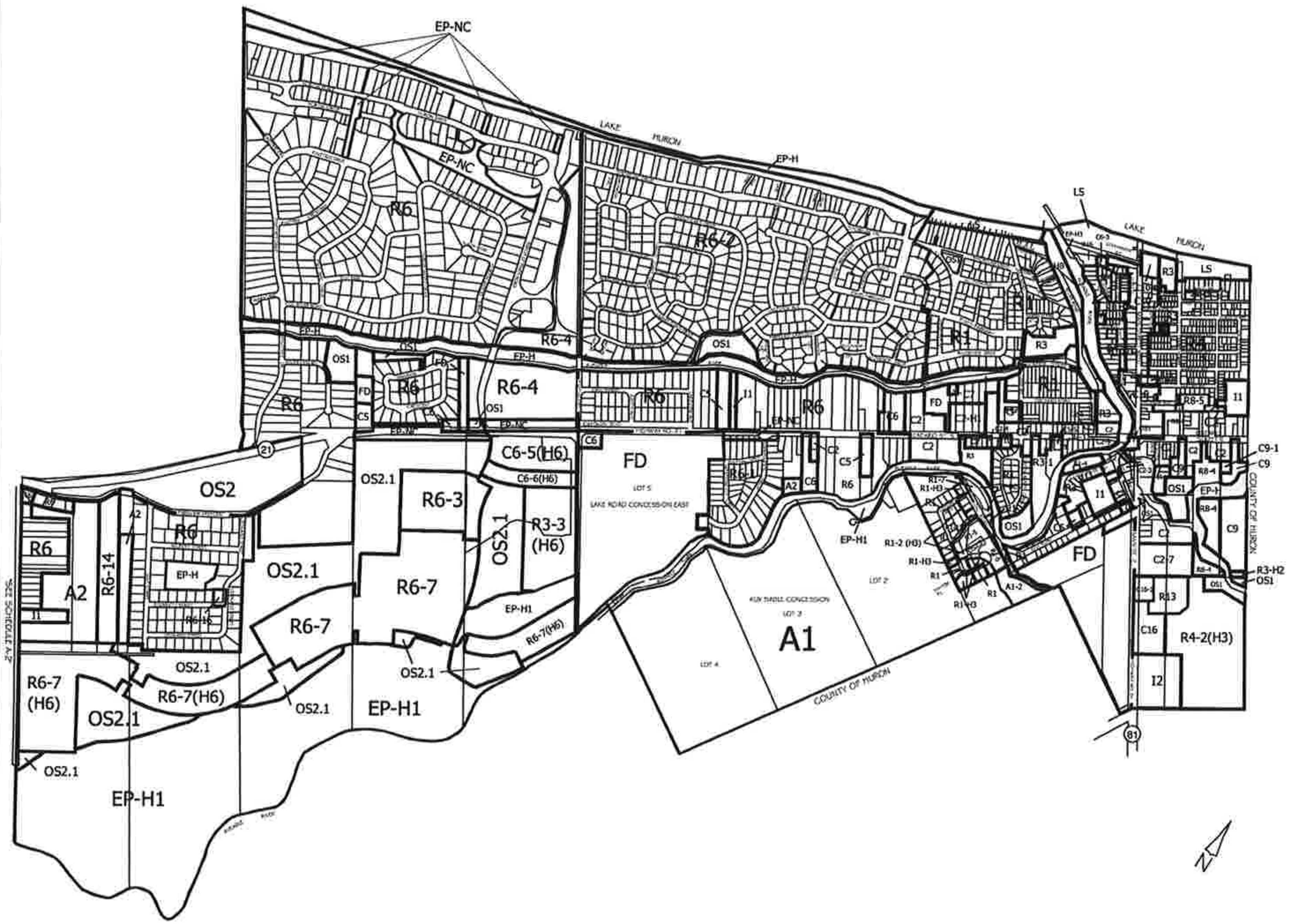
March 2003.

MUNICIPALITY OF LAMBTON SHORES
OFFICIAL PLAN
LAND USE SCHEDULE "A"

OPA# 17 B/L 7 of 2008, February 4, 2008




OFFICIAL PLAN
OF THE
MUNICIPALITY OF LAMBTON SHORES
SCHEDULE "A-1"
GRAND BEND
LAKE HURON
LAKE HURON
COUNTY OF HURON
COUNTY OF HURON
"SEE SCHEDULE A-2"
HIGHWAY NO. 21
AUSABLE RIVER
LOT 5
LAKE ROAD CONCESSION EAST
AUX SABLE CONCESSION
LOT 3
LOT 4
LOT 2
LOT 1
21
81
LEGEND
AGRICULTURE
RESIDENTIAL
RESIDENTIAL CONSTRAINT A
COMMERCIAL
URBAN DEVELOPMENT
HARBOUR
HAZARD AND ENVIRONMENTAL PROTECTION
OPEN SPACE
LAKESHORE
SCALE: 50 0 50 100 200 METRES
N
Amended OPA#3, May 5, 2003
PREPARED BY:
COUNTY OF LAMBTON
PLANNING AND DEVELOPMENT DEPARTMENT
MAY, 2001



Amended B/L 42 of 2003, July 7, 2003
Amended B/L 6 of 2004, January 19, 2004
Amended B/L 14 of 2004, February 16, 2004
Amended B/L 15 of 2005, March 7, 2005
Amended B/L 25 of 2005, April 18, 2005
Amended B/L 51 of 2005, July 8, 2005
Amended B/L 82 of 2005, December 19, 2005
Amended B/L 23of 2006, March 30, 2006
Amended B/L 27of 2006, April 13, 2006
Amended B/L 69of 2006, November 2, 2006
Amended B/L 78 of 2006, November 16, 2006
Amended B/L 4 of 2007, January 8, 2007*
Amended B/L 61 of 2007, June 18, 2007
Amended B/L 72 of 2007, September 4, 2007
Amended B/L 76 of 2007, September 4, 2007
Amended B/L 03 of 2008, January 7, 2008
Amended B/L 24 of 2008, April 21, 2008
Amended B/L 35 of 2008, June 16, 2008
Amended B/L 44 of 2008, July 7, 2008

MUNICIPALITY OF LAMBTON SHORES
SCHEDULE "A-1" (GRAND BEND)
TO BY-LAW NO. 1 OF 2003

PASSED THIS 3 DAY OF February, 2003

J.C. IVEY, MAYOR

CAROL McKENZIE, CLERK

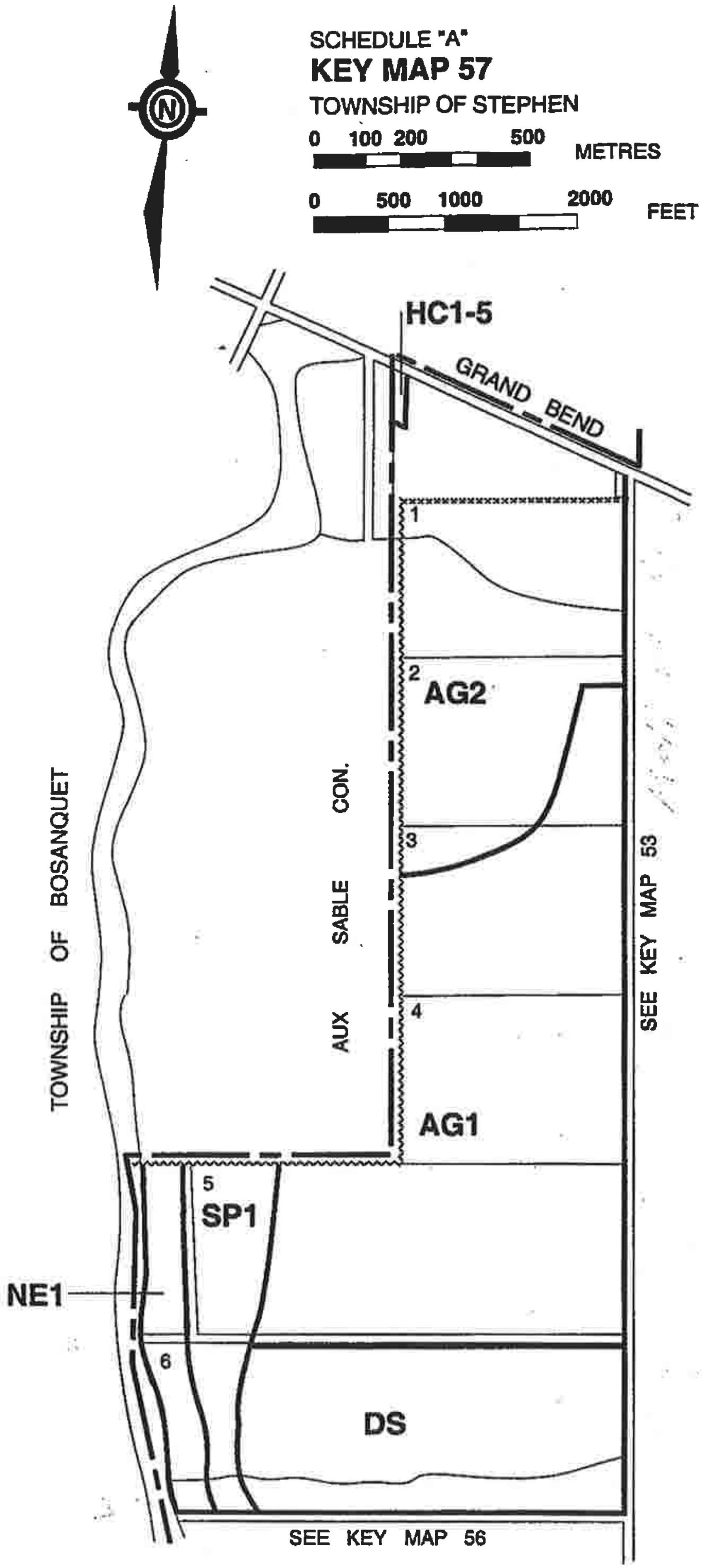
LEGEND

SYMBOL	ZONE
A1	AGRICULTURAL - 1
A2	AGRICULTURAL - 2
C2	COMMERCIAL - 2
C3	COMMERCIAL - 3
C5	COMMERCIAL - 5
C6	COMMERCIAL - 6
C7	COMMERCIAL - 7
C9	COMMERCIAL - 9
C10	COMMERCIAL - 10
C16	COMMERCIAL - 16
EP-H	ENVIRONMENTAL PROTECTION - HAZARD
EP-NC	ENVIRONMENTAL PROTECTION - NATURAL CONSERVATION
FD	FUTURE DEVELOPMENT
HB	HARBOUR
I1	INSTITUTIONAL - 1
I2	INSTITUTIONAL - 2
LS	LAKESHORE
OS1	OPEN SPACE - 1
OS2	OPEN SPACE - 2
R1	RESIDENTIAL - 1
R3	RESIDENTIAL - 3
R4	RESIDENTIAL - 4
R6	RESIDENTIAL - 6
R10	RESIDENTIAL - 10
R13	RESIDENTIAL - 13
R16	RESIDENTIAL - 16

-H1,-H2.. HOLDING PROVISIONS
- 1,-2,.. EXCEPTIONS

SCALE: 100 0 100 200 400 METRES

PREPARED BY:
COUNTY OF LAMBTON
PLANNING AND DEVELOPMENT DEPARTMENT
FEBRUARY, 2003



SCHEDULE "A"
KEY MAP 57
TOWNSHIP OF STEPHEN
0 100 200 500 METRES
0 500 1000 2000 FEET
N
HC1-5
GRAND BEND
1
2
AG2
3
4
AG1
5
SP1
6
DS
NE1
TOWNSHIP OF BOSANQUET
AUX SABLE CON.
SEE KEY MAP 53
SEE KEY MAP 56