

Elgin Area Primary Water Supply System

**Elgin Water Treatment Plant
Residuals Management Facility
Municipal Class Environmental Assessment
PROJECT FILE REPORT**

Prepared by:

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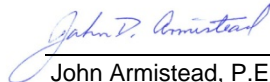
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Executive Summary

A. INTRODUCTION

The Elgin Area Primary Water Supply System (EAPWSS), through their consultant, AECOM has completed a Municipal Class Environmental Assessment (Class EA) study for the construction of a Residuals Management Facility (RMF) at the Elgin Water Treatment Plant (WTP). The Elgin WTP is located at 43665 Dexter Line, approximately 2 kilometres east of the community of Port Stanley in Central Elgin and provides municipal drinking water to the communities of London, St. Thomas, Aylmer, Bayham, Central Elgin, Malahide and Southwold that form the Elgin Area Water Supply System (EAWSS), as shown on Figure 1.

At present, process wastewater generated from the treatment of raw Lake Erie water at the Elgin WTP is discharged back into Lake Erie as part of the WTP's normal operation. The new RMF will significantly improve how residuals are managed and improve WTP process water quality being sent to Lake Erie.

The Residuals Management Facility project is part of the HELP Clean Water initiative, a regional infrastructure project which will supply safe, clean drinking water to over 500,000 residents as well as various businesses in Southwestern Ontario for generations to come.

The proposed works are considered a Schedule B undertaking in accordance with the Ontario Municipal Engineers Association (MEA) Municipal Class EA document (October 2000, as amended 2007). Therefore, Phases 1 and 2 of the MEA Class EA planning process apply to this study, which requires that a Project File be prepared and filed for a 30 calendar day review by the public and review agencies.

B. PROBLEM/OPPORTUNITY STATEMENT

The problem/opportunity statement for the Elgin WTP RMF Class EA is defined as follows:

Problem

At present, process wastewater generated from the treatment of raw Lake Erie water at the Elgin WTP is discharged back into Lake Erie as part of the WTP's normal operation.

There is a need to treat this process wastewater in order to meet the requirements of the Ministry of the Environment (MOE) criteria prior to being discharged into Lake Erie.

The 2008 EAPWSS Master Plan¹ confirmed the need for a RMF that will treat the WTP process wastewater including the proper disposal of the WTP solids (residuals).

Opportunity

The design and construction of the proposed RMF also provides an opportunity to minimize waste production and improve WTP operations.

In order to address the above problem/opportunity statement, the EAPWSS initiated this Class EA planning process in 2009 which identified and evaluated alternative RMF siting locations and residuals management strategies.

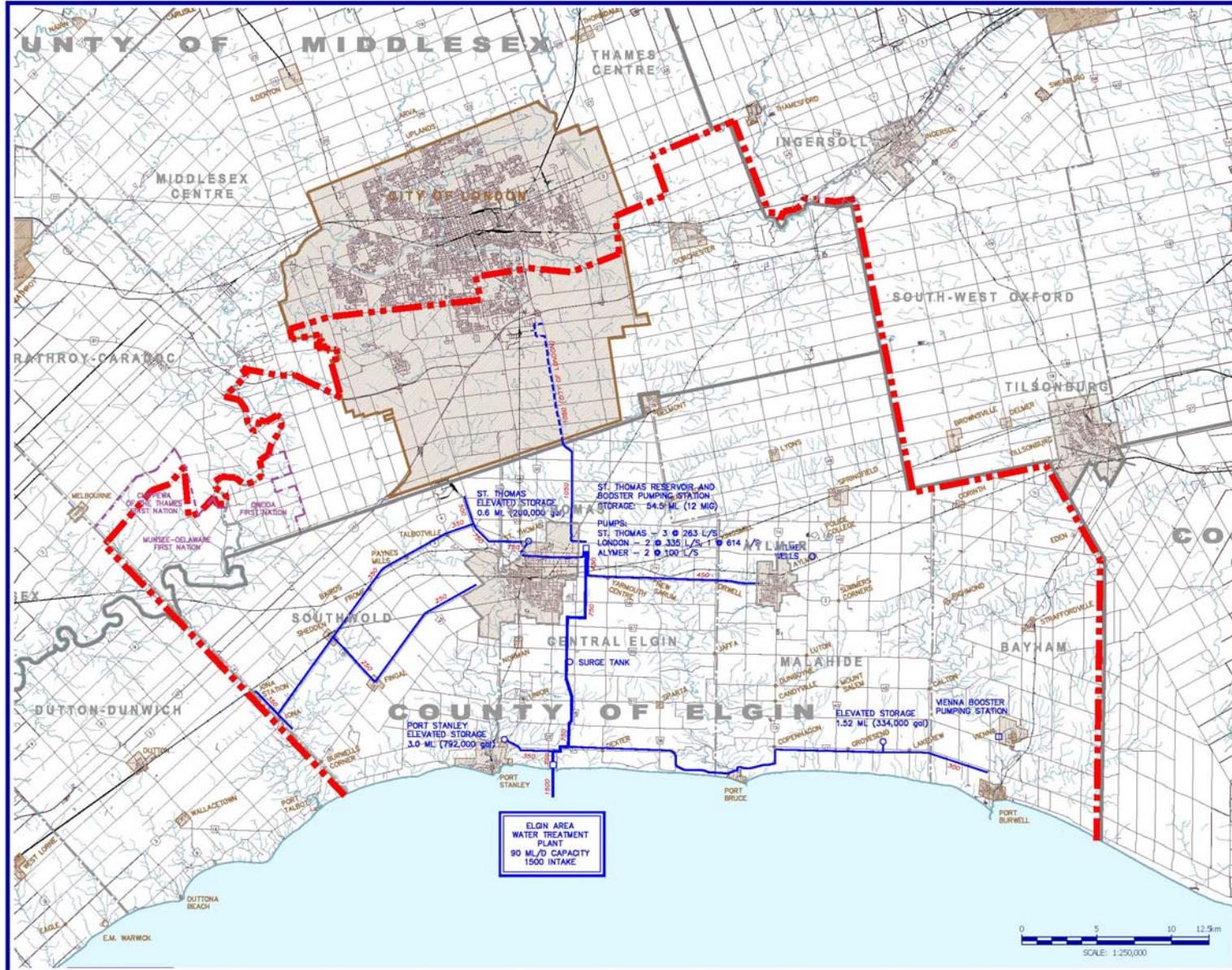
C. ALTERNATIVE SOLUTIONS

The following alternative solutions to the problem were identified:

- 1) **Do Nothing:** No improvements at the Elgin WTP and continue with existing practices;
- 2) **Treat Off-Site:** Transport wastewater residuals by truck or forcemain (i.e., to Port Stanley Wastewater Treatment Plant);
- 3) **Treat On-Site:** Build a RMF and dispose of residuals solids by landfill; and
- 4) **Limit Growth:** Revise the municipal planning documents to reflect limited growth.

¹ Elgin Area Primary Water Supply System 2008 Master Plan, Delcan 2010.

Figure 1 Elgin Area Water Supply System



Screening of Alternative Solutions

The Class EA planning process requires that all reasonable and feasible solutions to the problem be identified and described. The following table outlines the screening of the previously described alternative solutions.

Table 1 Screening of Alternative Solutions

Alternatives	Screening Considerations	Results of Screening
1) Do Nothing <ul style="list-style-type: none"> No improvements Continue with existing practices 	<ul style="list-style-type: none"> The “Do Nothing” alternative represents what would likely occur if none of the alternative solutions were implemented. Provides a baseline for evaluating alternatives. 	Carry forward for evaluation as a requirement of the Class EA process; however, does not address regulatory compliance.
2) Treat Off-Site (e.g., Port Stanley WWTP) <ul style="list-style-type: none"> Transport wastewater residuals by truck Transport wastewater residuals by forcemain 	<ul style="list-style-type: none"> Nearest WWTP’s (i.e., Port Stanley) do not have capacity to accommodate process wastewater flows. Significant environmental (e.g. numerous forcemain pipe water crossings) and social/cultural (e.g. increased truck traffic) impacts. Significant capital costs. Can address regulatory compliance. 	Screened from further consideration.
3) Treat On-Site <ul style="list-style-type: none"> Build Residuals Management Facility Dispose residual solids by landfill or other land application (reuse) 	<ul style="list-style-type: none"> Can be easily constructed and operated. Construction impacts limited to existing WTP site. Maximum reuse of existing infrastructure. Moderate capital costs. Can address regulatory compliance. 	Carry forward for evaluation.
4) Limit Growth <ul style="list-style-type: none"> Revise municipal planning documents to reflect limited growth 	<ul style="list-style-type: none"> Need for the project is regulatory compliance and not growth related. 	Screened from further consideration.

D. IDENTIFICATION OF ALTERNATIVE ON-SITE OPTIONS

Siting Guidelines

Carrying forward with the proposed treatment of residuals on-site, the following guidelines were used to identify siting options for the residuals management facility:

- 1) The site should be located in close proximity to the existing Elgin WTP for easier maintenance and operations;
- 2) The size of the site should be able to accommodate all residuals management activities including a site containment area for residuals (if landfill is temporarily unavailable), located with opportunities for expansion (if required), and should not interfere with future WTP expansion; and

- 3) The site location should avoid or reduce the potential impact on the adjacent land uses, conflict with existing infrastructure and utilities and sensitive natural features.

E. ALTERNATIVE SITING OPTIONS

Considering the location of the existing Elgin WTP facility layout including the potential to utilize vacant lands on the existing WTP property, two on-site alternatives were developed and evaluated against the “Do Nothing” alternative.

The two siting options include:

- **Siting Option 1:** Construct the RMF on the Elgin WTP property north of the unnamed watercourse (i.e., immediately south of the WTP facilities within the fenced property); and
- **Siting Option 2:** Construct the RMF off the Elgin WTP property, south of the unnamed watercourse on the east side of Pumping Station Road.

Figure 2 presents the two alternative siting options.

F. PREFERRED SITING OPTION

Based on the evaluation of alternative RMF siting options, Option 1 is preferred. Rationale for selecting Option 1 includes:

- Consolidates all WTP components on one site;
- Allows for efficient operations;
- Avoids significant tree/vegetation removal;
- Avoids displacement of agricultural lands;
- Lower construction and operation costs; and
- Easily constructed.

G. PROPOSED RESIDUALS MANAGEMENT FACILITY

Figure 3 illustrates the general site plan for the new RMF.

The proposed works will consist of the following key elements:

- Modifications to the existing sedimentation basins to incorporate continuous solids removal;
- New sedimentation basin solids pumping system and piping to new RMF;
- Modifications to filter to optimize backwash system;
- New piping from filters to new RMF;
- New RMF on existing site, immediately south of the main treatment building and east of the existing road to the low lift PS comprised of the following:
 - Sedimentation/backwash solids equalization tanks and pumping systems;
 - Solids thickeners;
 - Thickened solids storage tanks and pumping systems;
 - Centrifuge dewatering systems;
 - Dewatered solids conveying system and truck loading facility;
 - Associated chemical systems including dechlorination;
 - Associated controls and monitoring equipments; and
 - Building to house all equipment.
- Yard piping and civil works to support RMF.

It is proposed that design and approvals be completed in the spring/summer of 2011 with tender in the fall of 2011. Construction will require 24-30 months to complete starting in the late fall 2011. Critical sedimentation basin work will be co-ordinated to coincide with low demand from September to April.

H. MITIGATION MEASURES

Based on the evaluation of potential impacts, construction of the proposed RMF will result in short term impacts. By incorporating proper best management practices/construction techniques and controls, these impacts can be minimized. Impacts from operations will be limited to a slight increase in daily truck traffic (2-4 trucks per day).

I. CONSULTATION PROGRAM

As part of the planning process, efforts have been made to inform government/review agencies, First Nations and the local community of the nature and scope of the project and to solicit input/comments. These steps included publishing Notices of Study Commencement, Project Information Package and Study Completion in the London Free Press and St. Thomas Times Journal. Notification letters were also sent to adjacent land owners, stakeholders and those who requested that they be included on the mailing list.

In addition, a Project Information Package was made available for review at the Municipality of Central Elgin, the EAPWSS offices and Elgin WTP. The Project Information Package presented background information on the study including the various alternative solutions considered and a comparative analysis of those alternatives. The package also presented the recommended location for the RMF including general site plan, the preferred residuals management strategy and proposed mitigation measures.

No comments were received from the public or review agencies that could not be addressed.

J. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This Class EA covers the process required to ensure that the proposed study and associated proposed work meets the requirements of the *Environmental Assessment Act*. The Class EA planning process requires initial screening for a project of this type, and this initial screening has not identified any significant concerns that cannot be addressed by incorporating established mitigation measures during construction.

The preferred RMF siting option (Siting Option 1) and residuals management strategy addresses the problem and opportunity identified in this report and indicates only minor and predictable impacts, which are addressed by recommended mitigative measures presented in section 10.

Recommendations

Considering the above, it is recommended that:

- Following EA documentation filing and approval, the proposed RMF proceed to detailed design including the completion of supporting geotechnical and hydrogeological studies;
- Remaining MOE approvals be secured through the detailed design process;
- A Stage 1 Archaeological Assessment be completed during detailed design (additional archaeological investigations will be subject to Stage 1 findings) and submitted to the Ministry of Tourism and Culture for archaeological impact clearance; and
- The mitigation measures identified in section 10 of this report should be confirmed and further elaborated upon during detailed design, and implemented as part of the construction process.

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Acronyms

ANSI	Areas of Natural and Scientific Interest
C of A	Certificate of Approval
Class EA	Class Environmental Assessment
CSP	Corrugated Steel Pipe
EAA	<i>Environmental Assessment Act</i>
EAPWSS	Elgin Area Primary Water Supply System
EAWS	Elgin Area Water Supply System
ELC	Ecological Land Classification
ESA	Environmentally Sensitive Area
ESR	Environmental Study Report
hp	Horse Power
IPZ	Intake Pressure Zone
KCCA	Kettle Creek Conservation Authority
kPa	kilopascal
MEA	Municipal Engineers Association
MOE	Ministry of the Environment
MNR	Ministry of Natural Resources
MTO	Ministry of Transportation
NHIC	Natural Heritage Information Centre
NTU	Nephelometric Turbidity Units
ORC	Ontario Realty Corporation
OWRA	<i>Ontario Water Resources Act</i>
PIP	Project Information Package
PSI	Pound per Square Inch
PSW	Provincially Significant Wetland
PWQO	Provincial Water Quality Objectives
RMF	Residuals Management Facility
SCADA	Supervisory Control and Data Acquisition
The City	City of London
TSS	Total Suspended Solids
WTP	Water Treatment Plant

1. Introduction

1.1 Background

The Elgin Area Primary Water Supply System (EAPWSS), through their consultant, AECOM has completed a Municipal Class Environmental Assessment (Class EA) study for the construction of a Residuals Management Facility (RMF) at the Elgin Water Treatment Plant (WTP).

The EAPWSS is owned by a Joint Board of Management with the Corporation of the City of London (the City) acting in its' capacity as the administering municipality on their behalf.

The Elgin WTP is located at 43665 Dexter Line, approximately 2 kilometres east of the community of Port Stanley in Central Elgin and provides municipal drinking water to the communities of London, St. Thomas, Aylmer, Bayham, Central Elgin, Malahide and Southwold which forms the Elgin Area Water Supply System (EAWSS). Figure 1 illustrates the EAWSS including the location of the Elgin WTP.

At present, process wastewater generated from the treatment of raw Lake Erie water at the Elgin WTP is discharged back into Lake Erie as part of the WTP's normal operation. The new RMF will significantly improve how residuals are managed and improve WTP process water quality being sent to Lake Erie.

The Residuals Management Facility project is part of the HELP Clean Water initiative, a regional infrastructure project which will supply safe, clean drinking water to over 500,000 residents as well as various businesses in Southwestern Ontario for generations to come.

The total eligible cost of the HELP Clean Water initiative under the Building Canada Fund is \$150 million. The Governments of Canada and Ontario are each contributing up to \$50 million, with remaining costs the responsibility of the City of London, the Lake Huron Primary Water Supply System and the Elgin Area Primary Water Supply System.

1.2 Format of this Report

This report was prepared to meet the requirements of the Ontario Municipal Engineers Association (MEA) Municipal Class Environmental Assessment (Class EA) planning process. The report combines all phases of the planning process under one cover and incorporates steps considered essential for compliance with the requirements of the *Environmental Assessment Act (EAA)* in the following sections:

- **Section 1** provides an introduction and background information leading to the initiation of this Municipal Class EA study, an overview of the Municipal Class EA planning process and schedule followed, as well as describes the study scope, study area location, and the organization of the study team;
- **Section 2** describes current WTP operations and residuals management practices, study area features including existing and future land uses, as well as relevant social/cultural and natural environmental features;
- **Section 3** identifies and describes the problem and opportunity statement to be addressed in this Municipal Class EA;
- **Section 4** presents the alternative solutions to the problem/opportunity including the screening of these alternatives;
- **Section 5** identifies the alternative RMF siting options and describes siting option guidelines;

- **Section 6** outlines the evaluation methodology and development of evaluation framework and criteria;
- **Section 7** presents the evaluation of RMF siting options including the preferred site;
- **Section 8** presents the preferred residuals management strategy;
- **Section 9** describes the proposed works including RMF components and operations, required approvals, overview of construction and implementation timing;
- **Section 10** describes the recommended mitigation measures to ensure that any disturbances are managed to the best available methods;
- **Section 11** summarizes public, agency and First Nations consultation activities undertaken as part of this Class EA; and
- **Section 12** provides the final study conclusions and recommendations for the Elgin WTP Residuals Management Facility Municipal Class EA.

1.3 Elgin Area Water Master Plan Update 2003 and 2009

The EAPWSS Master Plan² was updated in 2010 to reflect new demand projections and current conditions. With respect to the Elgin WTP, the following capital improvement projects were identified:

- Expansion of the Elgin WTP (future project);
- Upgrades to the water transmission mains (under construction);
- Provision of back-up generator station (recently completed); and
- **Construction of a residuals management facility (subject of this study).**

1.4 Study Scope and Location

The scope of this study is to determine the best approach to treating the process wastewater from the treatment of drinking water that will meet the requirements of the Ministry of the Environment (MOE) criteria prior to being discharged into Lake Erie while improving the operations of the Elgin WTP.

The Elgin WTP is located on the south side of Dexter Line (County Road 24) at the intersection of Pumping Station Road in the Municipality of Central Elgin (Elgin County). The project study area is bounded by Dexter Line to the north, lands along the eastern WTP property limits, Hawk Cliff Road (County Road 22) to the west and Lake Erie to the south. Refer to Figure 2 for an illustration of the project study area.

² *Elgin Area Primary Water Supply System 2008 Master Plan, Delcan 2010.*

1.5 Study Organization

This Class EA study was administered and managed by the City of London on behalf of the EAPWSS Joint Board of Management. General direction was provided by the City of London staff with project team meetings being held at key points throughout the course of the project. The project team was comprised of the following individuals.

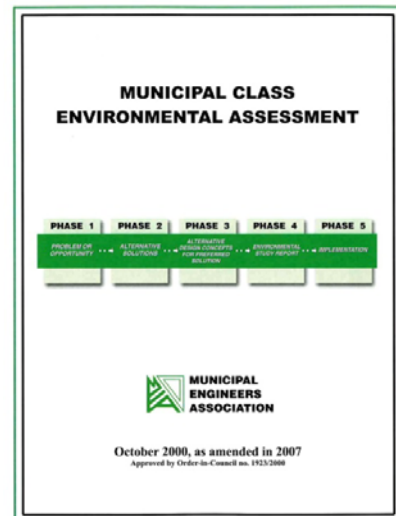
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	Simon Breese – Project Director
	Karl Grueneis – Senior Environmental Planner
	Joe Gemin – Project Engineer
	Ray Yu – Project Engineer
	Jessica Romano – EA Planner
	Jill deMan – Ecologist

1.6 Municipal Class Environmental Assessment Process

1.6.1 Overview

All municipalities in Ontario are subject to the provisions of the *Environmental Assessment Act (EAA)* and its requirements to prepare an Environmental Assessment for applicable public works projects. The Ontario Municipal Engineers Association (MEA) “Municipal Class Environmental Assessment” document (October 2000, as amended in 2007) provide municipalities with a five-phase planning procedure approved under the *EAA*.

This document identifies the necessary steps to plan and undertake all municipal sewage, water, stormwater management, transportation and transit projects that occur frequently, are usually limited in scale, and have a predictable range of environmental impacts and applicable mitigation measures. The five phases of the Municipal Class EA process are summarized below:



Phase 1 – Problem or Opportunity: Identify the problem or opportunity, need and justification;

Phase 2 – Alternative Solutions: Identify alternative solutions to address the problem by taking into consideration the existing environment, and establish the preferred solution taking into account public and agency review and input;

Phase 3 – Alternative Design Concepts for the Preferred Solution: Examine alternative methods of implementing the preferred solution, based upon the exiting environment, public and agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects;

Phase 4 – Environmental Study Report: Document in an Environmental Study Report (ESR) a summary of the rationale, planning, design, and consultation process of the project as established through the above phases and make such documentation available for scrutiny by review agencies and the public; and

Phase 5 – Implementation: Complete contract drawings and documents, and proceed to construction and operation, monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the complete facilities.

The Class EA process ensures that all projects are carried out with effectiveness, efficiency and fairness. This process serves as a mechanism for understanding the economic, social, and natural environmental concerns while implementing improvements to municipal infrastructure.

Figure 3 illustrates the process followed in the planning and design of projects covered by a Municipal Class EA, including the Elgin WTP Residuals Management Facility.

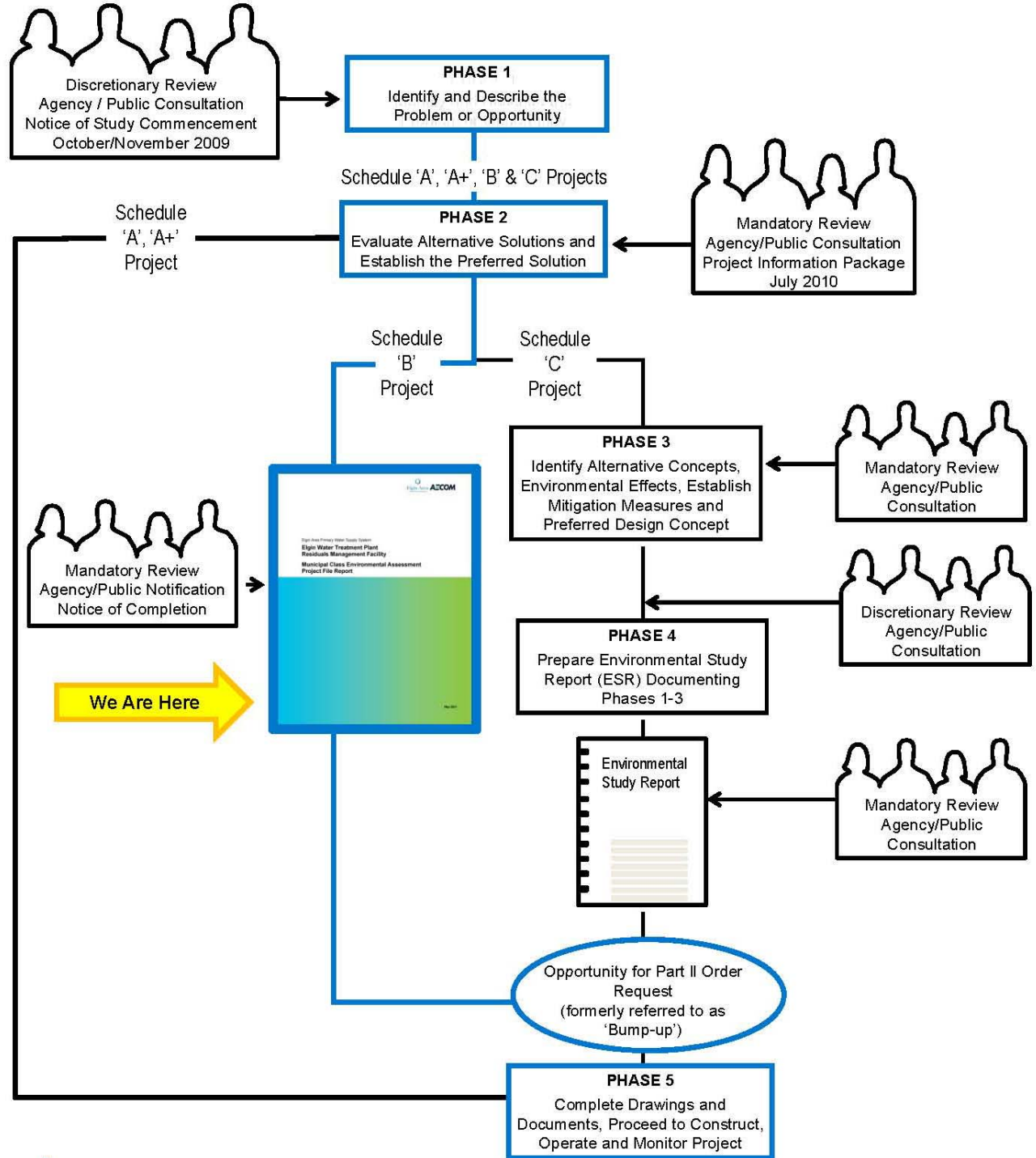
Mandatory Principles

The planning process followed not only adheres to the guidelines outlined by the Municipal Class EA document but also reflects the following five mandatory principles of Class EA planning under the EAA:

1. *Consultation with affected parties early on, such that the planning process is a co-operative venture;*
2. *Consideration of a reasonable range of alternatives;*
3. *Identification and consideration of the impacts of each alternative on all aspects of the environment;*
4. *Systematic evaluation of alternatives in terms of their advantages and disadvantages to determine the net environmental effects; and*
5. *Provision of clear and complete documentation of the planning process, to allow “traceability” of decision-making with respect to the project.*

Following these five principles ensures that the EA process is devoted to the prevention of problems and damage through planning and decision-making, recognizing that research and evaluation of possible impacts have been taken into account prior to the implementation of the project.

Figure 3 Overview of the Municipal Class Environmental Assessment Planning Process



 Indicates the Class EA Process followed for this Study

Project Classification

The Municipal Class EA document defines four types of projects and the planning processes required for each (referred to as Schedule A, A+, B or C).

The selection of the appropriate project planning schedule is dependent on the anticipated level of environmental impact and for some projects, the anticipated construction costs. Projects are categorized according to their environmental significance and their effects on the surrounding environment. Planning methodologies are described within the Municipal Class EA document and are different according to Class type, such as the following:

Schedule A: Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Class EA planning process. Schedule A projects generally include normal or emergency operational maintenance activities where the environmental effects of these activities are usually minimal. Examples of Schedule A projects include the installation of chemical or other process equipment for operational or maintenance purposes in existing WTPs and existing pumping stations or replacement of standby power equipment where new equipment is located within an existing building or structure. As such, these projects are pre-approved and consequently do not require any further planning and public consultation.

Schedule A+: The purpose of Schedule A+ is to ensure some type of public notification for certain projects that are pre-approved under the Municipal Class EA. The proponent is required to inform the affected public of municipal infrastructure projects prior to being constructed or implemented. However, there is no ability for the public to request a Part II Order³. Examples of Schedule A+ projects include the expansion/refurbish/upgrade of a WTP up to existing rated capacity where no land acquisition is required.

Schedule B: These projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process involving mandatory contact with directly affected public and with relevant government agencies to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, the project may proceed to implementation. Schedule B projects include establishing facilities for disposal of process wastewater (e.g., install sewer connection, construct holding pond, dewatering and hauling operations to disposal sites) or expanding existing WTP including intake up to existing rated capacity where land acquisition is required. As a result, the proponent is required to proceed through a screening process (Phases 1 and 2 of the Municipal Class EA process) including consultation with those who may be affected.

At the end of Phase 2, a Project File documenting the planning process followed through Phases 1 and 2 is finalized and made available for public and agency review. If the screening process raises a concern, which cannot be resolved, a Part II Order may be requested and considered by the Minister of the Environment. Alternatively, the proponent may elect to voluntarily plan the project as a Schedule C undertaking.

Schedule C: These projects have the potential for significant adverse environmental effects and must proceed under the full planning and documentation procedures (Phases 1 to 4) specified in the Municipal Class EA document. Schedule C projects require that an Environmental Study Report (ESR) be prepared and filed for review by the public and review agencies. If concerns are raised that cannot be resolved, a

³Part II Order refers to a request to the Minister of the Environment for a project to comply with Part II (addresses Individual Environmental Assessments) of the Environmental Assessment Act. The need for an Individual EA is based on the conclusion that based on predicted project impacts the MEA Class EA planning process is not sufficient and a more comprehensive EA planning process is required. The requirement to prepare an Individual EA involves the preparation of Terms of Reference and EA document that are submitted to the Ministry of the Environment (MOE), other government agencies and the public for review.

Part II Order may be requested. Schedule C projects typically include the siting and construction of new facilities and major expansions to existing facilities, such as water or wastewater treatment plants.

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

1.6.2 Project Planning Schedule

This project involves the establishment of facilities for disposal of WTP process wastewater, which falls under Schedule B of the MEA document. As such, Phases 1 and 2 of the planning process as described in the previous section was completed.

1.6.3 Project Documentation Filing

The documentation for a Schedule B project consists of a Project File Report. The placement of the Project File Report for public review completes the planning and preliminary design stages of the project.

The Project File Report is available for public review for a minimum 30 calendar day period. A public notice (Notice of Completion) is published in the local newspaper to announce the commencement of the public review period. Copies of the Project File Report and all supporting documentation are available during normal business hours at the following locations:

Municipality of Central Elgin (Elgin County Administration Building), Administrative Services 450 Sunset Drive St. Thomas, ON N5R 5V1	Elgin Area Primary Water Supply System 235 North Centre Road, Suite 200 London, Ontario N5X 4E7	Elgin Water Treatment Plant 43665 Dexter Line, RR 1 Union, Ontario N0L 2M0 (Offices are on the 2 nd Floor)
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The Project File is also available on the EAPWS website, www.watersupply.london.ca. If after reviewing the Project File Report, you have questions or concerns, please follow this procedure:

1. Contact the following representative to discuss your questions/concerns:

Mr. Brian Lima, P. Eng.
Capital Projects Manager
Lake Huron & Elgin Area Primary Water Supply Systems
c/o City of London
Regional Water Supply Division
Tel: 519.930.3505 ext. 7006
Fax: 519.474.0451
Email: blima@london.ca
www.watersupply.london.ca

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2. Arrange a meeting with the above if you have significant concerns that may require more detailed explanations;
3. If you raise major concerns, a representative from the EAPWSS will attempt to negotiate a resolution of the issues(s). A mutually acceptable time period for this meeting will be set. If the issues remain unresolved, you may request the Minister of the Environment, by order, to require the EAPWSS to comply with Part II of the *Environmental Assessment Act* before proceeding with the project; this is called a Part II Order (“bump-up”) request. The Minister may make one of the following decisions:
 - Deny the request;
 - Refer the matter to mediation; or

- Require the EAPWSS to comply with Part II of the *Environmental Assessment Act* by undertaking one of the following:
 - Set out directions with respect to preparing the Terms of Reference and an Individual EA for the undertaking; or
 - Declare that the EAPWSS (proponent) has satisfied the requirements for the preparation of a Terms of Reference, however, the proponent must still prepare an Individual EA.

All Part II Order Requests must be submitted in writing to the Minister of the Environment at the following address within the 30 calendar day review period:

Minister's Office
Ministry of the Environment
77 Wellesley Street West, 11th Floor, Ferguson Block
Toronto, Ontario M7A 2T5

A copy of the request must be forwarded to the Elgin Area Primary Water Supply System, addressed to the attention of Mr. Brian Lima (address provided above).

1.6.4 Consultation and Communication Program

As part of the planning process, consultation between the proponent and the affected stakeholders is an essential and effective tool that provides opportunities for information exchange and for those consulted to influence decision-making. The Municipal Class EA document outlines specific mandatory public and agency consultation points of contact and methods as well as discretionary points of contact with the public and agencies. In order to inform relevant government agencies, affected landowners and the local community/general public of the project to solicit comments and input the following were undertaken:

- Newspaper advertisements for the Notice of Study Commencement, Notice of Project Information Package and Notice of Study Completion;
- Direct mailing (e.g., letter and attached Notices of Study Commencement, Project Information Package and Study Completion) to stakeholders, affected land owners and review agencies regarding project milestones;
- Preparing a Project Information Package to provide stakeholders an opportunity to understand the purpose of the project, review the evaluation of alternatives and to obtain input from the public/review agencies and stakeholders;
- Posting project milestone information on the Regional Water Supply Division's website (www.watersupply.london.ca);
- Holding individual meetings with key affected stakeholders and review agencies, as required; and
- Preparing and filing the Project File Report for public and agency review.

The above consultation and communication program activities and results are further discussed in section 11.

2. Existing Conditions

2.1 Technical

2.1.1 Current WTP Operations

The WTP for the Elgin Area Primary Water Supply System (EAPWSS) has a current treatment capacity of 91 million litres per day (20 million Imperial gallons per day).

The current daily production (annual average) for this plant is 53 million litres per day (MLD) with a 2001 maximum day production of 74 million litres.

The Lake Erie intake crib for the WTP is located approximately 1.5 kilometres offshore in about 10 metres of water. The crib intake structure is designed for the plant's ultimate treatment capacity of 181 million litres per day.

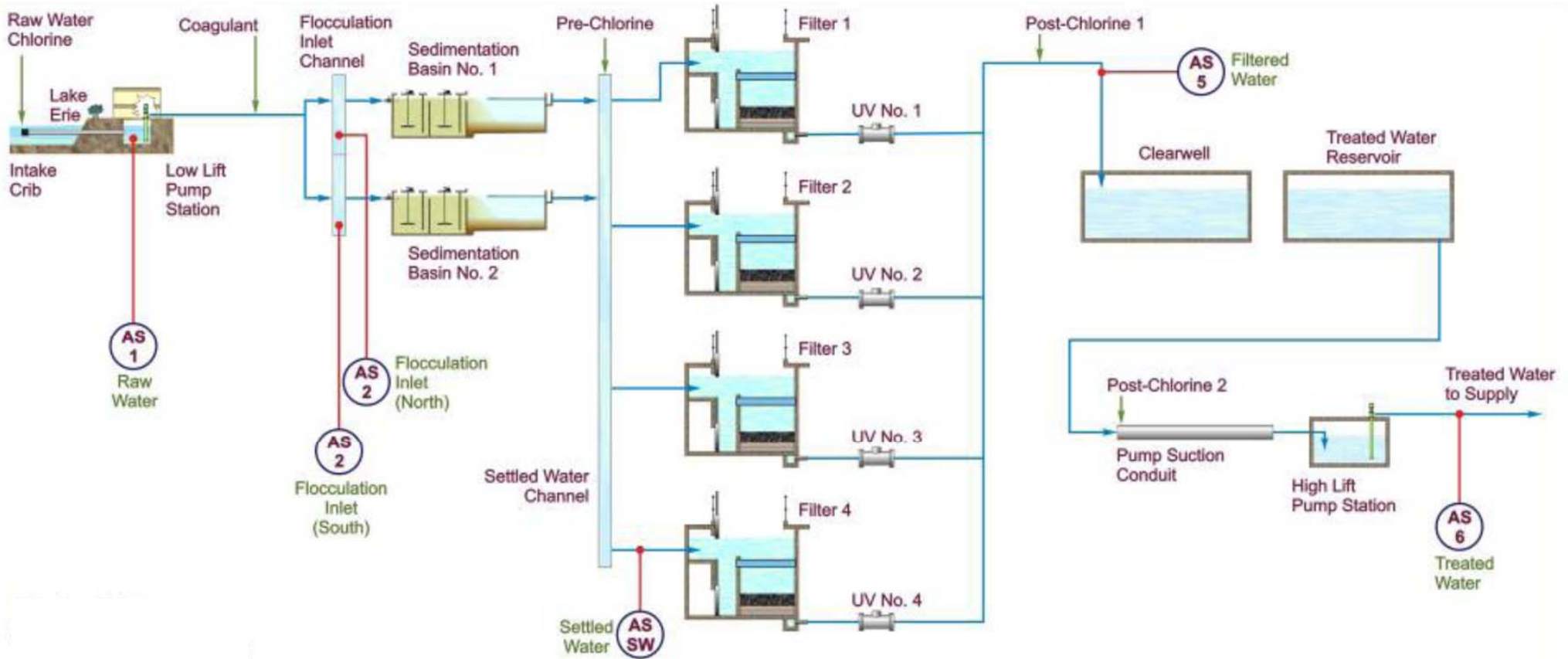
The water treatment system utilizes conventional chemically assisted flocculation and sedimentation systems, dual-media filtration, and chlorine as the primary disinfectant. The treatment system and water quality is continuously monitored using online analyzers and computerized Supervisory Control and Data Acquisition (SCADA) systems.

The WTP has four 700hp high-lift discharge pumps, which pump the water from the plant at an average pressure of 600 kPa (85 PSI) through the 15 kilometre long, 750mm (30 inch) pipeline (currently being twinned) to the St. Thomas Terminal Reservoir, located northeast of the City of St. Thomas. The water is then re-pumped to St. Thomas, London, Central Elgin, Malahide and Aylmer from this terminal reservoir. The 750mm (30 inch) pipeline also supplies water to the village of Port Stanley and the municipalities of Central Elgin, Malahide and Bayham along County Road 24 (Dexter Line).

Previous studies had identified a need to twin the existing WTP to 181 MLD in the 2010's. Due to various conservation activities implemented over the years, water demand has not increased as much as predicted. The most recent Master Plan (Delcan, August 2010) recommends that the plant capacity be increased by only 50% to 136.5 MLD in 2024 (to be reviewed based on actual demand).

Figure 4 presents a simplified process schematic of the Elgin WTP.

Figure 4 Elgin Water Treatment Plant Process Schematic



2.1.2 Current Residuals Management

At the Elgin WTP there are two main process waste streams to manage as follows:

1. Clarification/Sedimentation:

- Clarified solids settle and accumulate in existing Sedimentation Basins;
- Sludge depth is used to make decision on basin cleaning; and
- Cleaning Protocol involves removing basin from service, manual cleaning and blowdown into plant drain and discharge to Lake over a 4-8 hour process.

2. Filter Backwash:

- Solids accumulate in filters (4 filters);
- Backwash initiated based on pressure drop, runtime (72 hours max) or operator initiative based on observations/monitoring;
- Filter taken out of service;
- Filter backwashed at high rate to flush solids; and
- Solids discharged back to plant drain, discharge to Lake over a 1-2 hour process.

Residuals Management Challenges

The following summarizes the challenges with the existing approach:

- While one sedimentation basin is being washed down, effective treatment capacity is reduced by 50%;
- Sedimentation basin cleaning generates a very large high strength waste stream over a very short period of time;
- Filter backwash generates a very large volume of weak strength wastewater over a very short period of time;
- Discharges are intermittent with relatively long period between discharges; and
- Ideally residuals management facility would see relatively uniform continuous influent stream to optimize size and effectiveness.

Recommended Residuals Management Approach

Considering the above, the following is the recommended approach for managing residuals at the Elgin WTP:

- Optimize existing operations to reduce waste streams;
- Retrofit existing sedimentation basin to provide continuous solids discharge; and
- Build RMF and incorporate appropriate equalization within RMF to optimize equipment sizing.

2.2 Social/Cultural

2.2.1 Existing Land Use

Existing land uses surrounding the Elgin WTP consist primarily of agricultural lands with mostly cash crops, specialty crops and livestock operations. There are three single family residences in proximity to the Elgin WTP. South of the WTP, lands along Pumping Station Road and towards Lake Erie are also used by bird enthusiasts for viewing and banding (see section 2.3.3).

Also located near the Elgin WTP is the Hawk Cliff designated viewing area that includes a one kilometre section of Regional Road 22 (Hawk Cliff Road) south of Regional Road 24 (Dexter Line) to the cliff overlooking Lake Erie. Lands on either side of this area are privately owned.

2.2.2 Future Land Use

A WTP capacity expansion is planned for 2024 (exact timing to be confirmed) based on projected growth in demand⁴.

There are no planned developments or proposed changes to land uses in the immediate area of the WTP.

2.2.3 Municipality of Central Elgin Official Plan

The proposed new Central Elgin Official Plan (Draft January 2010) designates lands surrounding the Elgin WTP as “Agricultural”. Other designated land uses include natural hazard (unnamed watercourse) and natural heritage (Hawke’s Cliff Wetland)⁵.

2.2.4 Archaeological and Built Heritage Resources

A Stage 1 Archaeological Assessment is required to be completed at detailed design given the WTP’s close proximity to an unnamed watercourse and Lake Erie (high potential for encountering archaeological resources). Subject to findings, subsequent archaeological investigations may be required to obtain archaeological clearance. There are no built heritage resources in close proximity to the WTP.

2.3 Natural Environment

The Elgin WTP is within the jurisdiction of the Kettle Creek Conservation Authority (KCCA). AECOM ecologists completed field investigations on March 10, 2010. The intent of the investigations were to:

1. Identify the existing natural features and determine the significance of those features observed;
2. Provide input for a preliminary impact assessment and evaluation of alternatives; and
3. Determine mitigation measures for those features which require protection.

A copy of the field investigations memo can be found in Appendix B.

⁴ *Elgin Area Primary Water Supply System 2008 Master Plan, Delcan, August 2010.*

⁵ *Section 2.2.8.1 Financial, Capital and Public Works Policies Part A of the Municipality of Central Elgin Official Plan Draft January 18, 2010, states that “Public Infrastructure, buildings, structures, easements or right of ways may be considered within any designated area, subject to addressing appropriate buffering and screening from adjacent land uses”.*

2.3.1 Terrestrial Environment

Terrestrial features located near the WTP include Hawke's Cliff Wetland (KC25) which is classified as a Provincially Significant Wetland (PSW) and is located downstream of the WTP on the west side of Pumping Station Road. There is also a Locally Significant Wetland located upstream of the WTP on the north side of Dexter Line.

Surrounding the WTP buildings terrestrial features mainly include a manicured lawn with seven planted trees. Tree species observed within this area include red pine (*Pinus resinosa*) and red oak (*Quercus rubra*).

Within the study area, there are also two (2) woodlands. The first woodland (Woodland No. 1) is located approximately 8-12 metres beyond the south fence line of the existing WTP property limits. This feature is identified within the Municipality of Central Elgin's Official Plan as a Natural Heritage Feature.

Dominant tree species observed within this woodland include sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), red oak, with red pine, yellow birch (*Betula alleghaniensis*), and white ash (*Fraxinus americana*) associates. Associated with this woodland were very steep valley lands with approximately 35 to 38 degree slopes leading down towards an unnamed watercourse. The distance from the proposed building's edge (see section 7, Figure 7) to the top of slope was approximately 24.5 metres. However, the actual edge of the woodland begins at the fence line which is approximately 8 - 12 metres away from the proposed RMFs building's edge.

It is important to note that the woodland and manicured lawn are separated by a chain link fence followed by a row of red pine which acts as a buffer before the beginning of the steep slopes. Therefore, dependant on geotechnical conditions and with proper erosion mitigation measures in place, this feature is not anticipated to be negatively affected by the construction of the RMF.

The second woodland (Woodland No. 2) surrounds an unnamed watercourse (south branch) and has been identified as a Natural Heritage Feature according to the Municipality of Central Elgin's Official Plan Schedule A Central Elgin Land Use Map. It is also located adjacent to the Ministry of Natural Resources (MNR) Bird Banding Station operated by the Bob Hubert Hawk Cliff Raptor Banders.

Dominant species observed within Woodland No. 2 include sugar maple, beech and red oak. Steep valley lands were also associated with the watercourse within the woodland with slopes measuring approximately 30 degrees.

Figure 5 shows the location of the previously described natural environmental features in relation to the WTP.

Figure 5 Natural Environmental Features

2.3.2 Aquatic Environment

Two branches of an unnamed watercourse are located south of the WTP and east of Pumping Station Road and flow generally east to west. Both branches of the floodplains are regulated by KCCA (illustrated on Figure 5). The confluence of the two branches is on the west side of Pumping Station Road.

The northern branch (directly south of the WTP) is a strong meandering, permanent watercourse with a well defined channel. Small cyprinids were observed within the watercourse and an individual cyprinid was captured with a dip net and photographed during the field visit.

The southern branch is within an incised valley but is not as strongly meandering and exhibited signs of less flow energy than the northern branch in that from observations the channel was shallower with less erosion with an abundance of undisturbed leaf litter within the channel. This branch likely does not provide significant habitat for fish.

The watercourse west of Pumping Station Road exhibited similar characteristics to the north branch on the east side of Pumping Station Road with this system flowing under Hawk Cliff Road and eventually into Lake Erie.

2.3.3 Wildlife and Wildlife Habitats

The area around the Elgin WTP is an important Hawk migration site known for large flights of raptors along the north shore of Lake Erie as they migrate out of Canada. To the west of Pumping Station Road there are designated viewing areas that includes a one kilometre section of Hawk Cliff Road (Regional Road 22) south of Regional Road 24 (Dexter Line), where it dead ends at the cliff overlooking Lake Erie. While not officially designated, Pumping Station Road and lands to the south of the WTP are also frequently used for raptor viewing and banding. The bird banding stations are in use from September to December during the raptor migration period.

3. Phase 1: Identification and Description of the Problem and Opportunity Statement

3.1 Problem and Opportunity Statement

Phase 1 of the five-phase Class EA planning process requires the proponent of an undertaking to first document factors leading to the conclusion that the improvement is needed, and develop a clear statement of the problem/opportunity to be investigated.

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

The problem/opportunity statement is described as follows:

Problem

At present, process wastewater generated from the treatment of raw Lake Erie water at the Elgin WTP is discharged back into Lake Erie as part of the WTP's normal operation.

There is a need to treat this process wastewater in order to meet the requirements of the Ministry of the Environment (MOE) criteria prior to being discharged into Lake Erie.

The 2008 Master Plan⁶ confirmed the need for a RMF that will treat the WTP process wastewater including the proper disposal of the WTP solids.

Opportunity

The design and construction of the proposed RMF also provides an opportunity to minimize waste production and improve WTP operations.

In order to address the above problem/opportunity statement, the EAPWSS Joint Board initiated this Class EA planning process in 2009 which identified and evaluated alternative RMF siting locations and residuals management strategies.

⁶ Elgin Area Water Supply System 2008 Master Plan, Delcan 2010.

4. Phase 2: Alternative Solutions to the Problem

4.1 Alternative Solutions

The following alternative solutions to the problem were identified:

- 1) **Do Nothing:** No improvements at the Elgin WTP and continue with existing practices.
- 2) **Treat Off-Site:** Transport wastewater residuals by truck or forcemain (i.e., to Port Stanley Wastewater Treatment Plant).
- 3) **Treat On-Site:** Build a RMF and dispose of residuals solids by landfill.
- 4) **Limit Growth:** Revise the municipal planning documents to reflect limited growth.

4.2 Screening of Alternative Solutions

The Class EA planning process requires that all reasonable and feasible solutions to the problem be identified and described. The following alternative solutions were subject to a screening exercise as summarized in Table 1.

Table 1 Screening of Alternative Solutions

Alternatives	Screening Considerations	Results of Screening
1) Do Nothing <ul style="list-style-type: none"> • No improvements • Continue with existing practices 	<ul style="list-style-type: none"> • The “Do Nothing” alternative represents what would likely occur if none of the alternative solutions were implemented. • Provides a baseline for evaluating alternatives. 	Carry forward for evaluation as a requirement of the Class EA process; however, does not address regulatory compliance.
2) Treat Off-Site (e.g., Port Stanley WWTP) <ul style="list-style-type: none"> • Transport wastewater residuals by truck • Transport wastewater residuals by forcemain 	<ul style="list-style-type: none"> • Nearest WWTP’s (i.e., Port Stanley) do not have capacity to accommodate process wastewater flows. • Significant environmental (e.g. numerous forcemain pipe water crossings) and social/cultural (i.e., increased truck traffic) impacts. • Significant capital costs. • Can address regulatory compliance. 	Screened from further consideration.
3) Treat On-Site <ul style="list-style-type: none"> • Build Residuals Management Facility • Dispose residual solids by landfill or other land application (reuse) 	<ul style="list-style-type: none"> • Can be easily constructed and operated. • Construction impacts limited to existing WTP site. • Maximum reuse of existing infrastructure • Moderate capital costs. • Can address regulatory compliance. 	Carry forward for evaluation.
4) Limit Growth <ul style="list-style-type: none"> • Revise municipal planning documents to reflect limited growth 	<ul style="list-style-type: none"> • Need for the project is regulatory compliance and not growth related. 	Screened from further consideration.

5. Identification of Alternative RMF Siting Options

Carrying forward with the proposed treatment of residuals on-site, the following alternative siting options for the RMF were identified.

5.1 Siting Option Guidelines

The following guidelines were used to identify siting options for the residuals management facility:

- 1) The site should be located in close proximity to the existing Elgin WTP for easier maintenance and operations;
- 2) The size of the site should be able to accommodate all residuals management activities including a site containment area for residuals (if landfill is temporarily unavailable), located with opportunities for expansion (if required), and should not interfere with future WTP expansion; and
- 3) The site location should avoid or reduce the potential to impact on the adjacent land uses, conflict with existing infrastructure and utilities and sensitive natural features.

5.2 Description of Alternative Siting Options

Considering the location of the existing Elgin WTP facility layout including the potential to utilize vacant lands on the existing WTP property, two on-site alternatives were developed and evaluated against the “Do Nothing” alternative.

The two siting options include:

- **Siting Option 1:** Construct the RMF on the Elgin WTP property north of the unnamed watercourse (i.e., immediately south of the WTP facilities within the fenced property); and
- **Siting Option 2:** Construct the RMF off the Elgin WTP property, south of the unnamed watercourse on the east side of Pumping Station Road.

Figure 6 presents the two alternative siting options.

6. Evaluation Framework and Criteria

6.1 Development of Evaluation Framework and Criteria

An evaluation framework was developed as presented in Table 2 based on five environmental components that together address the broad definition of the environment as described in the *Environmental Assessment Act (EAA)*⁷.

Table 2 Evaluation Components

Component	Description
Natural	• Component having regard for protecting the natural and physical components of the environment (e.g., air, land, water and biota), including natural heritage and environmentally sensitive areas.
Social/Cultural	• Component that evaluates potential effects on residents, agricultural uses, businesses, community features and historical/archaeological and heritage components.
Legal/Jurisdictional	• Component that considers potential land requirements and compliance with planning policies.
Economic/Financial	• Component that compares the potential financial costs.
Technical	• Component that considers the technical suitability and other engineering aspects.

Based on the above listed components, Table 3 presents the evaluation criteria that were used in the evaluation of alternative siting options.

⁷ The *Environmental Assessment Act (Section 1. (c) (i) to (vi))* defines the “environment” as: “air, land, water, plant and animal life including humans; the social and cultural conditions that influence the life of humans or a community; any building, structure, machine or other device or thing made by humans; any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or; any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.” This definition of the environment is used and is reflected in the environmental components used in the evaluation of alternative site options.

Table 3 Evaluation Criteria

Component	Evaluation Criteria
Natural	<ul style="list-style-type: none"> • Potential effects on fisheries/aquatic habitat (e.g., number and type of watercourse crossings, changes to water quality/levels/baseflow contribution); • Proximity to wetlands, Environmentally Sensitive Areas (ESAs), Areas of Natural and Scientific Interest (ANSIs), and Designated Natural Areas; • Potential effects on woodlands, trees, and other terrestrial vegetation (e.g., number and significance of trees removed and/or disturbed, extent of loss/disturbance of grass/vegetation); and • Potential effects on sensitive species habitat (e.g., proximity to vulnerable/threatened/endangered or locally/regionally rare amphibians, birds and other wildlife).
Social/Cultural	<ul style="list-style-type: none"> • Potential for temporary disruption (e.g., dust, noise, vibration) during construction to residences and businesses and agricultural operations; • Potential for temporary disruption during operations (e.g., increased truck traffic); • Potential for loss and/or disruption to archaeological and built heritage resources (e.g., significance and ability to mitigate); and • Compliance with applicable planning policies and regulations (e.g., Conservation Authority regulations and MOE water quality).
Economic/Financial	<ul style="list-style-type: none"> • Estimated construction and operating costs.
Technical	<ul style="list-style-type: none"> • Constructability (e.g., ease of construction, construction staging); • Ability to maintain Elgin WTP operations during construction; and • Operation and maintenance issues.

6.2 Use of Descriptive Information and Qualitative Evaluation

An assessment of each alternative site was completed based on the above evaluation criteria and then ranked based on an objective evaluation. The proposed evaluation methodology is not based on a numerical ranking system but rather the professional expertise of the project team. To ensure statistical validity, a numerical approach would have to strictly adhere to statistical methods that are often difficult to apply in a multi-faceted issue such as a Municipal Class EA. Instead, a descriptive or qualitative evaluation was used to consider the suitability of each site option. In this respect, the trade-offs made between alternatives are described in this Project File, and these trade-offs form the rationale for the identification of the recommended site. Trade-offs involve forfeiting an advantage or accepting a disadvantage to address a higher priority consideration. For information purposes only, the alternatives have been ranked in order of preference (based on advantages/disadvantages) under the discussion with respect to each aspect of the environment.

As shown on the evaluation table (Table 4 at the end of section 7), the following rating symbols were used:



7. Evaluation of Alternative RMF Siting Options

7.1 Evaluation Summary

To facilitate the comparative evaluation of RMF siting options, the previously presented Table 3, evaluation criteria were applied. The result of the evaluation is provided in the form of an evaluation matrix in Table 4.

Based on the evaluation, Option 1 is preferred. Rationale for selecting Option 1 includes:

- Consolidates all WTP components on one site;
- Allows for efficient operations;
- Avoids significant tree/vegetation removal;
- Avoids displacement of agricultural lands;
- Lower construction and operation costs; and
- Easily constructed.

8. Residuals Management Strategy

The Elgin WTP employs conventional treatment including gravity sedimentation and multi-media filtration. Historically, wastes generated in the sedimentation tanks and filters have been returned back to Lake Erie through the plant drain. Current practice dictates that these waste streams, while mainly solids removed from the Lake, should receive treatment to reduce the potential impact of the concentrated discharges in the Lake in the general vicinity of the discharge pipe. As such, four residual management strategies⁸ were developed as follows:

- 1) Do Nothing on Main Plant (no optimization or retrofit), and Build RMF;
- 2) Retrofit New Scrapers and Conduct Process Optimization, and then Build RMF;
- 3a) Retrofit New Scrapers and Construct One New Clarification Train, and then Build RMF; and
- 3b) Build Two New Clarification Trains, and then Build RMF.

The evaluation of the above alternatives included a cost-benefit investigation and concluded that Options 2 and 3b were essentially equal. Following evaluation, the alternatives were then ranked on effective capacity and funding availability. Subsequent to a workshop held on January 8, 2010, it was determined that Option 2 was preferred. Rationale for Option 2 includes:

- It was determined that the 50% throughput reduction was manageable with minimal risk to the City of London;
- The short-term (24 hour) shut down of production was manageable with minimal risk to the Elgin System customers;
- The additional capacity and investment in future expansion represented by Option 3b was of minimal benefit within the mid-term (10 year) horizon; and
- The capital costs of both Options (2 and 3a/b) are well beyond the planned costs for the project. Option 3b, at \$4.9M greater than Option 2 represents an additional increase in cost to the Elgin System that cannot be justified.

⁸ *Elgin Area Water Treatment Plant Residuals Management Facility Preliminary Design Report-Draft, AECOM, December 2010.*

9. General Description of Proposed Works and Operations

9.1 Proposed Works

Carrying forward with the preferred siting option (i.e., Option 1) and preferred residuals management strategy (i.e., Option 2), the following provides a description of the proposed RMF components:

- Modifications to the existing sedimentation basins to permit the automatic collection and removal of settled solids;
- Modifications to existing plant drainage piping system to separate clarifier sludge and backwash waste drains from other stormwater and sanitary water drains;
- Connections to the existing sedimentation basins, to transfer the settled sludge from the sedimentation basin to the clarifier sludge equalization basins;
- Connections to the existing filter drain pipe, to transfer the filter backwash waste to the backwash waste equalization basins;
- The new RMF includes the following major components:
 - Backwash waste equalization basins with a minimum operating volume of 2,760 m³;
 - Clarifier sludge equalization basin with a minimum operating volume of 300 m³;
 - Backwash waste clarifier-thickeners with Lamellar settlers capable of treating maximum daily filter backwash waste flow;
 - Clarifier sludge thickeners with Lamellar settlers capable of treating the clarifier sludge generated under 95th percentile turbidity conditions;
 - Thickened sludge storage tanks with a minimum effective volume of 745 m³;
 - A pumping station including pumps to transfer backwash waste, clarifier sludge, and thickened sludge;
 - A centrifugation facility capable of dewatering thickened sludge at maximum plant solid loading events;
 - Polymer feed facilities for preparing and dosing polymer to sludge treatment processes;
 - Dewatered sludge⁹ conveyance facilities;
 - Dechlorination system to ensure effluent has no chlorine residual; and
 - Treated effluent and emergency overflow pipes.

The RMF will also include an adjacent on site temporary short term containment area for excess residuals storage in the event that a disposal facility is temporarily unavailable. Storage is expected to be short-term (a few days at most). If odours become an issue temporary measures can be taken including application of lime or dispersion of an odour masking agent. Figure 7 illustrates the general site plan for the new residuals management facility.

⁹ Sludge cake is the concentrated solids resulting from the sludge thickening and dewatering portions of the overall water treatment process. Typical characteristics are that it is relatively dry to touch with no free water present, about 22% solids concentration. It is non-hazardous and comprised mainly of aluminum hydroxides. In contrast to wastewater treatment sludge's, it is relatively inert and much less odourous.

9.2 Operations

Based on residuals treatment process flows approximately 2-4 trucks are expected to use the RMF per day. With respect to noise and odour management, noise levels are expected to be moderate and similar to those from the WTP operations and mitigated through RMF building design. All of the equipment will be housed in-doors, including residuals truck loading which will minimize any odours. The Lake Huron WTP has a similar facility for managing sedimentation solids and odours are not a concern.

9.3 Overview of Construction

Considering previous Elgin WTP facility construction experience, construction of the RMF is expected to be straight forward. It is noted that excavations will be to a depth of approximately 7 metres and some dewatering may be required. Regarding the RMF's proximity to the unnamed watercourse and associated steep slope, geotechnical investigations, to be completed at detailed design will address slope stability. The RMF layout has been selected to minimize any potential slope stability concerns.

9.4 Review Agency Approvals

During detailed design and prior to construction, approvals will be required from several agencies including Kettle Creek Conservation Authority (KCCA), MOE and Ministry of Tourism and Culture in addition to various utility companies as further described below.

9.4.1 Kettle Creek Conservation Authority

Through correspondence with KCCA and review of the proposed RMF general site plan, KCCA confirmed that a permit under the *Conservation Authorities Act* (i.e., Ontario Regulation 181/06 Development Interference with Wetlands and Alteration to Watercourse and Shoreline Regulation) is not required.

9.4.2 Ministry of the Environment

The plant is currently still operating under a Certificate of Approval (Water). Conversion to a Licence is in progress. Once detailed design has been completed, the EAPWSS will be required to obtain amendments to existing C of A (Water), or Licence as appropriate. The C of A will also address the noise and odour emissions from the new RMF.

A pre-consultation meeting was held July 5, 2010 with representatives of the Ministry of the Environment (MOE) to discuss the project and proposed approach. Ministry representatives present were:

- Bill Armstrong – Environmental Planner;
- Hugh Geurts – Surface Water Specialist; and
- John McGlynn – Provincial Officer.

The purpose of the meeting was to:

- Summarize the work to date;
- Discuss effluent criteria; and
- Discuss approach to peak solids management.

AECOM presented an overview of current conditions and commitment to implement residuals management at some time in the future as part of the transfer of the assets from the Province to the

EAPWSS. The Elgin WTP is somewhat unique in that the raw water turbidity can spike several orders of magnitude in a short period of time due to conditions in Lake Erie. Extending the intake was evaluated but this was determined to not be practical. In order to provide an economically feasible solution it was proposed to design the facilities for the 95th percentile of raw water turbidity. During extreme peak events, even with maximum treatment, the equalization tanks may become overloaded and overflow to the effluent pipe. This approach was considered to be reasonable given it is still a great improvement over existing conditions and during such an event the raw water quality would still be worse than the quality of the effluent discharged in terms of turbidity. A mass balance was performed to estimate the worst case blended effluent during a by-pass condition. It is estimated that the blended effluent would contain up to 147 mg/L of suspended solids.

The MOE acknowledged the challenges of dealing with such a highly variable and unpredictable raw water source and that the proposed works represented a significant improvement over historical conditions. The MOE indicated that the following conditions could be expected in the CofA:

1. TSS 25 mg/L monthly average based on weekly 24-h composite;
2. Peak TSS to be confirmed;
3. Continuous on-line TSS and Chlorine residual monitoring; and
4. Non-acutely lethal effluent in accordance with Federal requirements (*Canadian Environmental Protection Act*).

In order to achieve item 4 (and establish item 2) it would be necessary for the effluent to be essentially free of chlorine residual and the TSS concentration be below a threshold considered to be acutely lethal.

The proposed treatment process includes a dechlorination step to ensure that the effluent will be essentially free of chlorine residual.

The level of TSS that would result in an acutely lethal condition is much more difficult to establish. It was agreed that a raw water sample would be obtained during a peak turbidity event and submitted to an accredited laboratory for acute lethality testing to establish a demonstrated non-lethal condition to assist in developing a peak TSS limit. A mass balance should also be provided to demonstrate that the effluent TSS would be below this limit.

A raw water sample was collected on October 21, 2010 and submitted to Pollutech Enviroquatics Limited for acute lethality testing and Maxxam Analytics for TSS/NTU testing. The results are presented in Table 5.

Table 5 Raw Water Acute Lethality Testing

Parameter	Result
Rainbow Trout Lethality	0% (100% survived)
Daphnia Magna Lethality	0% (100% survived)
TSS	280 mg/L
Turbidity	290 NTU

The turbidity of 290 NTU represents approximately the 99th percentile raw water turbidity. Even at this high value the raw water had 0% mortality for both rainbow trout and Daphnia magna. The corresponding TSS concentration of 280 mg/L represents a value greater than (almost double) the expected worst case effluent quality during a peak treatment combined effluent discharge.

On the basis of the testing results the proposed approach is considered to be reasonable. Upon initiation of detailed design, a meeting with MOE will be held to review the findings of the EA document and how detailed design will proceed.

9.4.3 Ministry of Tourism and Culture

Following its completion at detailed design, a Stage 1 Archaeological Assessment will be submitted to the Ministry of Tourism and Culture for clearance. Subject to the findings of the Stage 1 assessment, additional archaeological investigations may be required to obtain archaeological clearance.

9.5 Implementation Schedule

The key steps to implementation of the project include:

- Completion of the Class EA process (spring 2011);
- Completion of WTP studies/optimization (spring 2011);
- Completion of archaeological and geotechnical studies (spring/summer 2011);
- Pre-Selection of key equipment (spring 2011);
- Detailed design and approvals (spring-fall 2011);
- Tender (fall 2011);
- Construction (fall 2011- fall 2013); and
- Commissioning and operation (winter 2013).

A critical schedule requirement is that the retrofits to the existing sedimentation basins be implemented during the low flow period of September to March each year (2 years required). The completion of the modifications to two sedimentation basins will be prior to the commissioning of the RMF. Therefore, the settled sludge from sedimentation basins will be pumped directly to the existing plant drain temporarily. The yard piping completed for this purpose will turn into an emergency bypass when the RMF is successfully commissioned.

Finally, the implementation plan must take into consideration other ongoing projects including filter modifications, twinning of the transmission main to St. Thomas and commissioning of the Southeast Reservoir and Pumping Station.

10. Potential Environmental Effects and Recommended Mitigation Measures

Based on the evaluation of potential impacts, the proposed construction of the RMF will result in short term impacts. Potential effects from construction activities on migrating birds was reviewed by AECOM's wildlife ecologist which determined that there will be little to no effect. This is considering the conditions of the overall corridor along the northern shore of Lake Erie and the RMF construction footprint being approximately 1.2 kilometres from the Lake shoreline. By incorporating proper best management practices/construction techniques and controls, these impacts can be minimized. Impacts from operations will be limited to a slight increase in truck traffic. Based on operational experience from the Huron WTP, RMF odour generation is not envisioned to be a problem. Anticipated construction and operations related impacts are summarized below along with associated mitigating measures that will be employed to reduce the potential impacts of the proposed works.

10.1 Mitigation Measures

The following table summarizes the potential environmental effects and proposed mitigation measures for the construction and operation of the residuals management facility.

Table 6 Potential Environmental Effects and Proposed Mitigation Measures

Potential Effect	Proposed Mitigation
Tree Removal	<ul style="list-style-type: none"> Limited to a few ornamental trees within WTP manicured lawn.
Sediment Deposition and Erosion Control and Slope Stability	<ul style="list-style-type: none"> KCCA confirmed that a Permit (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) is not required. Maintain agreed upon set back from unnamed watercourse. Sedimentation and erosion control plan. Complete hydrogeological investigations to determine dewatering and groundwater control. Complete geotechnical investigations to address slope stability. Regularly monitor and properly maintain (e.g., following rain events) the integrity of all sediment trapping devices. Restore disturbed areas to natural or better conditions.
Noise/Vibration/Dust	<ul style="list-style-type: none"> Construction will be restricted to the day shift (wherever possible). Dust control by spraying water, street sweeping and calcium chloride as required, RMF operations involve approximately 2-4 trucks per day-schedule for day time.
Archaeology	<ul style="list-style-type: none"> A Stage 1 Archaeological Assessment will be completed during detailed design. If any archaeological and/or historical resources are discovered during the performance of the work in the area of the discovery is to halt. The Ministry of Tourism and Culture (Archaeological Unit) will be notified for an assessment of the discovery. Work in the area of the discovery will not resume until cleared to do so by the Ministry.
Visual Impact	<ul style="list-style-type: none"> Incorporate screening and landscaping. Building architecture to match existing WTP buildings.

11. Public, Agency and First Nations Consultation

11.1 Public and Agency Notification

As part of the Municipal Class EA communications and consultation program, efforts have been made to inform government review agencies, key stakeholders and the local community of the nature and scope of the project and to solicit input/comments. These steps included mailing the Notice of Study Commencement, Notice of Project Information Package and Notice of Study Completion.

Copies of the above mentioned notices can be found in Appendix D.

11.2 Public Notification

At the beginning of the study, a Notice of Study Commencement was mailed to property owners within the study area outlining the project and to inform them of the project and solicit comments. The Notice of Study Commencement was also published in the London Free Press on October 24, 2009 and St. Thomas Journal on November 20 and 24, 2009.

A second letter and notice was sent to the adjacent property owners to inform them that a Project Information Package (PIP) was available for review at the following locations:

<p>Municipality of Central Elgin (Elgin County Administration Building), Administrative Services 450 Sunset Drive St. Thomas, ON N5R 5V1</p>	<p>Elgin Area Primary Water Supply System 235 North Centre Road, Suite 200 London, Ontario N5X 4E7</p>	<p>Elgin Water Treatment Plant 43665 Dexter Line, RR 1 Union, Ontario N0L 2M0 (Offices are on the 2nd Floor)</p>
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The Notice of Project Information Package (PIP) was advertised in the London Free Press and St. Thomas Journal on October 30, 2010 and November 3, 2010.

11.3 Phase 2 Project Information Package

As part of the study, a Project Information Package was put together to present background information on the study including the various alternative solutions considered and a comparative analysis of those alternatives. The package also presented the recommended location for the RMF and proposed mitigation measures. By way of public notice, the preparation of this Project Information Package fulfills the mandatory Class EA Phase 2 public and review agency contact point and no public information centre was held.

A copy of the Project Information Package can be found in Appendix D.

11.4 Public Comments and Responses

To date, no comments have been received from the public.

11.5 Review Agency, Area Municipality and Other Stakeholder Consultation

11.5.1 Kettle Creek Conservation Authority

In a letter dated November 17, 2009, AECOM requested information regarding the unnamed watercourse and woodlands within the study area, KCCA regulation limit/floodplain mapping and any other relevant information.

KCCA responded with a letter dated November 27, 2009 stating that there are no inventories or studies related to the unnamed watercourse or woodlands at this time and that with respect to the documentation of rare species, the MNR should be contacted. KCCA also noted that portions of the subject lands are affected by KCCA regulations and a permit (under the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Ontario Regulation 181/06) must be obtained from the conservation authority prior to any development and/or alterations.

Also included in this letter was identification of significant wetlands located upstream and downstream of the WTP property and away from the proposed RMF.

A second letter was sent to KCCA on November 8, 2010 that presented an overview of the project to date (e.g., Alternative RMF Siting Options and evaluation) as well as a site visit request. Also attached to the letter was a Notice of PIP.

A response, dated November 10, 2010 was received from KCCA confirming that based on review of the proposed RMF general site plan, a permit under Ontario Regulation 181/06 was not required.

AECOM's letter and KCCA response letter can be found in Appendix E.

11.5.2 Ontario Realty Corporation

The ORC responded to the Notice of Study Commencement on November 30, 2009. The letter explained that ORC lands are within the study area and this project has the potential to impact the ORC lands. In a letter dated December 8, 2009 EAPWSS responded to the ORC's November 30, 2009 letter stating that ORC recently executed a lease agreement with the EAPWSS for the occupancy of an air quality monitoring station by the MOE on EAPWSS lands. The letter also states that the license agreement limits the occupancy to a small area of the plant property, not the entire WTP property and that ORC comments from the November 30, 2009 letter appear to be not applicable or require further clarification. EAPWSS requested that ORC review the issues and provide clarification.

11.5.3 First Nations

11.5.3.1 *Responsibilities of the Elgin Area Primary Water Supply System*

The EAPWSS hereby acknowledges that, for the purposes of any S.35 Duty borne by Ontario, the EAPWSS is Ontario's delegate and in this capacity is responsible for carrying out the procedural aspects of consultation delegated to it by Ontario pursuant to this agreement.

11.5.3.2 *First Nations Consultation*

In a letter dated November 20, 2009, the Ministry of the Attorney General responded to the Notice of Study Commencement requesting that all inquired and communications be sent to the Aboriginal and Ministry Relationships Branch of the Ministry of Aboriginal Affairs.

The following First Nations were contacted at selected points in the planning process in order to explain the project and solicit feedback:

- Caldwell First Nation;
- Bkejanong Territory (Walpole Island);
- Oneida Nation of the Thames; and
- Chippewas of the Thames.

Consultation with the First Nations included all mandatory and discretionary Class EA contact points in addition to several follow up phone calls. No correspondence has been received to date from the above listed First Nations.

First Nations correspondence can be found in Appendix E.

12. Conclusions and Recommendations

12.1 Conclusions

This Class EA covers the process required to ensure that the proposed study and associated proposed work meets the requirements of the *Environmental Assessment Act*. The Class EA planning process requires initial screening for a project of this type, and this initial screening has not identified any significant concerns that cannot be addressed by incorporating established mitigation measures during construction.

The preferred RMF siting option (Siting Option 1) and residuals management strategy addresses the problem identified in this report and indicates only minor and predictable impacts, which are addressed by recommended mitigative measures presented in section 10.

12.2 Recommendations

Considering the above, it is recommended that:

- Following EA documentation filing and approval, the proposed RMF proceed to detailed design including the completion of supporting geotechnical and hydrogeological studies;
- Remaining MOE approvals be secured through the detailed design process;
- A Stage 1 Archaeological Assessment be completed during detailed design (additional archaeological investigations will be subject to Stage 1 findings) and submitted to Ministry of Tourism and Culture for archaeological impact clearance; and
- The mitigation measures identified in section 10 of this report should be confirmed and further elaborated upon during detailed design, and implemented as part of the construction process.