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December 13, 2017 File No. 115157

Triton Engineering Services Limited
105 Queen Street West Unit 14
Fergus, ON N1M 1S6

Attn: **Christine Furlong, P.Eng.**
Project Manager

Ref: **Town of Erin, Urban Centre Wastewater Servicing Class EA**
Wastewater Treatment Plant Site Selection, Technical Memorandum

Dear Ms. Furlong:

We are pleased to present our Technical Memorandum for the "Wastewater Treatment Plant Site Selection" for the Urban Centre Wastewater Servicing Schedule 'C' Municipal Class Environmental Assessment (EA).

This Technical Memorandum provides a review of the Wastewater Treatment Plant (WWTP) Site Alternatives and is based on the preferred general alternative solution identified in the Servicing and Settlement Master Plan (SSMP). The Technical Memorandum establishes and evaluates alternative sites for the WWTP as a component of Phase 3 and of the Municipal Class EA process. The recommended preferred WWTP site presented in this Technical Memorandum will remain in draft until completion of the public review process.

Yours truly,

AINLEY & ASSOCIATES LIMITED

DRAFT

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Joe Mullan, P.Eng.
Project Manager

Town of Erin
Urban Centre Wastewater Servicing
Class Environmental Assessment

Technical Memorandum
Wastewater Treatment Plant Site Selection

Draft

December 2017

Ainley GROUP
CONSULTING
ENGINEERS
PLANNERS

Urban Centre Wastewater Servicing Class Environmental Assessment

Technical Memorandum
Wastewater Treatment Plant Site Selection

Project No. 115157

Prepared for:
The Town of Erin

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Glossary of Terms

ACS	Assimilative Capacity Study: see assimilative capacity.
ADF	Average Daily Flow, typically presented through the report in units of cubic metres per day (m3/d).
Ainley	Primary engineering consultant for the Class EA process.
Alternative Solution	A possible approach to fulfilling the goal and objective of the study or a component of the study.
Assimilative Capacity	The ability of receiving water (lake or river) to receive a treated effluent discharge without adverse effects on surface water quality, eco-system and aquatic life.
BOD_5	Biochemical oxygen demand is the amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample at 20 ^{o}C over a 5-day period.
Build-out	Refers to a future date where all vacant and underdeveloped lots have been fully developed in accordance with the Town's Official Plan.
CCME	Canadian Council of Ministers of the Environment is comprised of the environment ministers from the federal, provincial and territorial governments. The council determines national environmental priorities and determines work needed to achieve positive environmental results, focusing on issues that are Canada-wide in scope.
CEAA	*Canadian Environmental Assessment Act*, S.C. 1992, c.37 (Federal)
Class EA	Municipal Class Environmental Assessment, a planning process approved under the EA Act in Ontario for a class or group of municipal undertakings. The process must meet the requirements outlined in the "Municipal Class Environmental Assessment" document (Municipal Engineers Association, October 2000, as amended). The Class EA process involves evaluating the environmental effects of alternative solutions and design concepts to achieve a project objective and goal and includes mandatory requirements for public consultation.
CVC	Credit Valley Conservation Authority
Design Concept	A method of implementing an alternative solution(s).
Discharge Potential	The volume of effluent the receiving water can accommodate based on the assumptions and results of an assimilative capacity study.
DFO	Department of Fisheries and Oceans, the federal agency responsible for developing and implementing policies and programs in support of Canada's economic, ecological and scientific interests in ocean and inland waters.
EA Act	*Environmental Assessment Act*, R.S.O. 1990, c.E.18 (Ontario)
Effluent	Liquid after treatment. Effluent refers to the liquid discharged from the WWTP to the receiving water.
Equivalent Population	Equivalent Population represents Residential Population plus Institutional/ Commercial/Industrial wastewater flow sources expressed as the equivalent number of residents, while Residential Population represents

	the "actual" population exclusive of Institutional/ Commercial/ Industrial wastewater flows.
ESR	Environmental Study Report, a report prepared at the culmination of Phase 4 of the Class EA process under a Schedule C planning process.
Evaluation Criteria	Criteria applied to assist in identifying the preferred solution(s).
Forcemain	A pressurized pipe used to convey pumped wastewater from a sewage pumping station.
Geotechnical Investigation	Study of the engineering behavior of earth materials such as soil properties, rock characteristics, natural slopes, earthworks and foundations, etc.
Gravity sewer	A pipe that relies on gravity to convey sewage.
Harmon Peaking Factor	A standard formula used for the estimation peak day flows based on the average daily flow (ADF).
Horizontal Directional Drilling (HDD)	A trenchless technology method of pipeline construction that could be used for the construction of sewage forcemains or for small diameter sewer construction under watercourse crossings.
HSEL	Hardy Stevenson and Associates Limited is the firm conducting the public consultation process for this Class EA.
Hydrogeological	Study of the distribution and movement of groundwater in soil or bedrock.
Infill	A process of development within urban areas that are already largely developed. Refers specifically to the development of vacant or underdeveloped lots.
Infiltration/Inflow (I&I)	Rainwater and groundwater that enters a sanitary sewer during wet weather events or due to leakages, etc.
Intensification	A process of development within existing urban areas that are already largely developed. Refers specifically to the redevelopment of lots to increase occupancy.
L/c/d	Litres per capita per day.
LPS System	Low-Pressure Sewer System refers to a network of grinder pump units installed at each property pumping into a common forcemain.
LSSDS	Large subsurface disposal systems.
m^3/ha/d	Cubic metres per hectare per day.
Master Plan	A comprehensive plan to guide long-term development in a particular area that is broad in scope. It focuses on the analysis of a system for the purpose of outlining a framework for use in future individual projects.
MOECC	Ministry of the Environment and Climate Change, the provincial agency responsible for water, wastewater and waste regulation and approvals, and environmental assessments in Ontario.
MNR	Ministry of Natural Resources, the provincial agency responsible for the promotion of healthy, sustainable ecosystems and the conservation of biodiversity in Ontario.
NPV	Net Present Value is the value in the present of a sum of money, in contrast to some future value it will have when it has been invested at compound interest.

O&M	Operation and maintenance
Open-cut Construction	Method of constructing a pipeline by open excavation of a trench, laying the pipe, and backfilling the excavation.
Part II Order	A component of the Class EA process providing an opportunity to request the Minister of Environment and Climate Change to require the proponent to comply with a Part II of the EA Act and prepare an Individual Environmental Assessment.
Peak Flow	An estimation of the maximum volume of wastewater generated over a single day. The peak day flow is calculated by multiplying the ADF by the Harmon Peaking Factor.
PIC	Public Information Centre
PLC	Public Liaison Committee
Preferred Alternative	The alternative solution which is the recommended course of action to meet the objective statement based on its performance under the selection criteria.
Private Treatment System	Lot-level or communal sewage treatment methods, such as septic systems or aerobic treatment systems, which remain in private ownership.
Sewage Pumping Station (SPS)	A facility containing pumps to convey sewage through a forcemain to a higher elevation.
PWQO	Provincial Water Quality Objectives (PWQO) are numerical criteria which serve as chemical and physical indicators representing a satisfactory level for surface waters (i.e. lakes and rivers). The PWQO are set at a level of water quality which is protective of all forms of aquatic life and all aspects of the aquatic life cycles during indefinite exposure to the water.
ROW	Right-of-way applies to lands which have an access right for highways, roads, railways or utilities, such as wastewater conveyance pipes.
Sanitary Sewer	Sewer pipe that conveys sewage to a sewage pumping station or sewage treatment plant. Part of the sewage collection system.
Screening Criteria	Criteria applied to identify the short-list of alternative solutions from the long-list of alternative solutions.
Service Area	The area that will receive sewage servicing as a result of this study.
Service Life	The length of time that an infrastructure component is anticipated to remain in use assuming proper preventative maintenance.
Sewage	The liquid waste products of domestic, industrial, agricultural and manufacturing activities directed to the wastewater colleciton system.
Sewage Treatment Plant (STP)	A plant that treats urban wastewater to remove solids, contaminants and other undesirable materials before discharging the treated effluent back to the environment. Referred to in this Class EA as a Wastewater Treatment Plant.
SSMP	Servicing and Settlement Master Plan – the master plan for Erin which was conducted by B.M. Ross in 2014 and establishes the general preferred alternative solution for wastewater.
STEP/STEG	Septic Tank Effluent Pumping/ Septic Tank Effluent Gravity, refers to a method of wastewater collection which collects the liquid portion of waste from the septic tanks while the solids remain for removal and treatment by a separate method.

Study Area	The area under investigation in which construction may take place in order to provide servicing to the Service Area.
TKN	Total Kjeldahl Nitrogen is the sum of organic nitrogen, ammonia (NH_3), and ammonium (NH_4+) in the wastewater.
TP	Total Phosphorus is a measure of the concentration of all phosphorus compounds in the wastewater.
Trenchless technology	Methods of installing a utility, such as a sewer, without excavating a trench, including directional drilling, microtunneling etc.
Triton	Town of Erin engineering consultant
Trunk Sewer	A sewer that collects sewage from a number of tributary sewers.
TSS	Total Suspended Solids is a measure of the concentration of suspended solids in a sample of wastewater. Includes both fixed and volatile suspended solids.
UCWS Class EA	Urban Centre Wastewater Servicing Class Environmental Assessment
Wastewater	See Sewage
Wastewater Treatment Plant (WWTP)	See Sewage Treatment Plant.

1.0 Purpose and Study Background

In 2014 the Town of Erin completed a Servicing and Settlement Master Plan (SSMP) to address servicing, planning and environmental issues within the urban areas of Erin Village and Hillsburgh. The aforementioned SSMP examined issues related to wastewater servicing and concluded that the preferred solution for both urban areas was a municipal wastewater collection system conveying wastewater to a single wastewater treatment plant located south east of Erin Village with treated effluent being discharged to the West Credit River.

In August of 2013, B. M. Ross concluded an Assimilative Capacity Study (ACS) establishing that a surface water discharge of treated effluent to the West Credit River was a viable alternative and suggested that the most suitable location for a WWTP outfall to the West Credit River would be situated between 10th Line and Winston Churchill Boulevard. It should be noted that the discharge from a WWTP was recommended to be located below Erin Village because of the greater assimilative capacity in this part of the river. The water quality records within this span of the river indicate lower contaminant concentrations than in other locations upstream. MOECC and CVC agreed with this approach. An update to the ACS during this UCWS Class EA study has confirmed the viability of this location and has established effluent criteria that will permit both communities to be built out to full build out of the present OP. In keeping with the recommended discharge location, the SSMP identified a general area for the location of a WWTP along Wellington County Road 52 in the area of 10th Line. Whereas the SSMP recommended preferred alternative was a single treatment plant with a capacity of 2,610 m^3/d, servicing a population of 6,000 persons, this UCWS Class EA study has identified a recommended preferred alternative treatment plant with a capacity of 7,172 m^3/d servicing a population of 14,459 persons.

The Terms of Reference for this study require that alternative sites in this area be identified and evaluated and a recommended preferred site selected. The purpose of this memorandum is to identify alternative potential locations for the WWTP and conduct a detailed evaluation to select the recommended preferred WWTP site.

1.1 Related Documents and Projects

Several related studies were completed prior to the commencement of this UCWS Class EA Study and each of these studies was reviewed for pertinent information related to this project. They are described in brief in the following subsections.

1.2 Zoning Bylaw

The Town of Erin's Zoning Bylaw (No. 07-67) provides detailed information to control the development of properties within the Town. The bylaw regulates many aspects of development, including the permitted uses of property, the location, size, and height of buildings, as well as parking and open space requirements.

1.3 Servicing and Settlement Master Plan (SSMP)

The SSMP was developed by B.M. Ross and Associates Limited (2014) with the goal to develop appropriate strategies for community planning and municipal servicing, consistent with current provincial, county and municipal planning policies. The SSMP process followed the Master Plan approach, specifically Approach 1, as defined in the Municipal Class Environmental Assessment (Class EA) document, dated October 2000 (as amended in 2007 and 2011).

2.0 General Review of Potential WWTP Site Area

The potential location for a wastewater treatment facility was thoroughly reviewed during the 2014 SSMP and a clear rationale was established for the location along Wellington Road 52 between County Road 124 and Winston Churchill Boulevard where the assimilative capacity of the West Credit River is maximised. The location of the wastewater treatment plant identified during the SSMP was largely based on the service area, suggested wastewater collection system and the required discharge location.

The Collection System Alternatives Technical Memorandum completed as part of this UCWS Class EA study identifies a preferred collection system that conveys all wastewater to a Sewage Pumping Station at the South end of Erin Village and a forcemain from that Sewage Pumping Station that pumps all wastewater along Wellington Road 52 towards 10th Line. The Effluent Discharge Location Technical Memorandum also completed as part of this UCWS Class EA, examines three (3) potential locations for treated effluent discharge to the West Credit River. Two locations are examined at 10th Line and one at Winston Churchill Boulevard with the preferred discharge location being located at Winston Churchill Boulevard. Wastewater from all alternative WWTP sites will therefore have to be pumped from the WWTP site.

Based on the above considerations, the lands along Wellington Road 52 between Highway 124 and Winston Churchill Boulevard with direct access of Wellington Road 52, were examined for possible sites. The lands are characterized as mildly undulating with farmlands/aggregate extraction areas to the South and the McCullough Drive/Aspen Court subdivision/farmland/large homes to the North. Elevations along Wellington Road 52 are typically between 385m and 395m above sea level. The valley of the West Credit River and tributaries to the north of the road is generally 10-15 m below this elevation. Groundwater north of Wellington Road 52 flows north to the river valley. An area for a possible WWTP was therefore established as follows:

- The area South of the McCulloch Drive/Aspen Court and extending 200 m east of the subdivision was eliminated due to the potential impact on the residential area;
- The area North of Wellington Road 52 between 10th Line and Winston Churchill Boulevard was eliminated as it consists of private residences;
- The area South of Wellington Road 52 extending from 300 m east of 10th Line to Winston Churchill Boulevard was eliminated as it could impact several private residences along the South and North side of Wellington Road 52;
- All lands to the North of Wellington Road 52 within CVC protected areas were eliminated due to the potential environmental impacts;

Based on the above, Figure 1 shows the area for the potential locations of the WWTP. Per the Zoning Bylaw, the study area is zoned primarily agricultural, secondary agricultural, Greenland's and Core Greenland's.

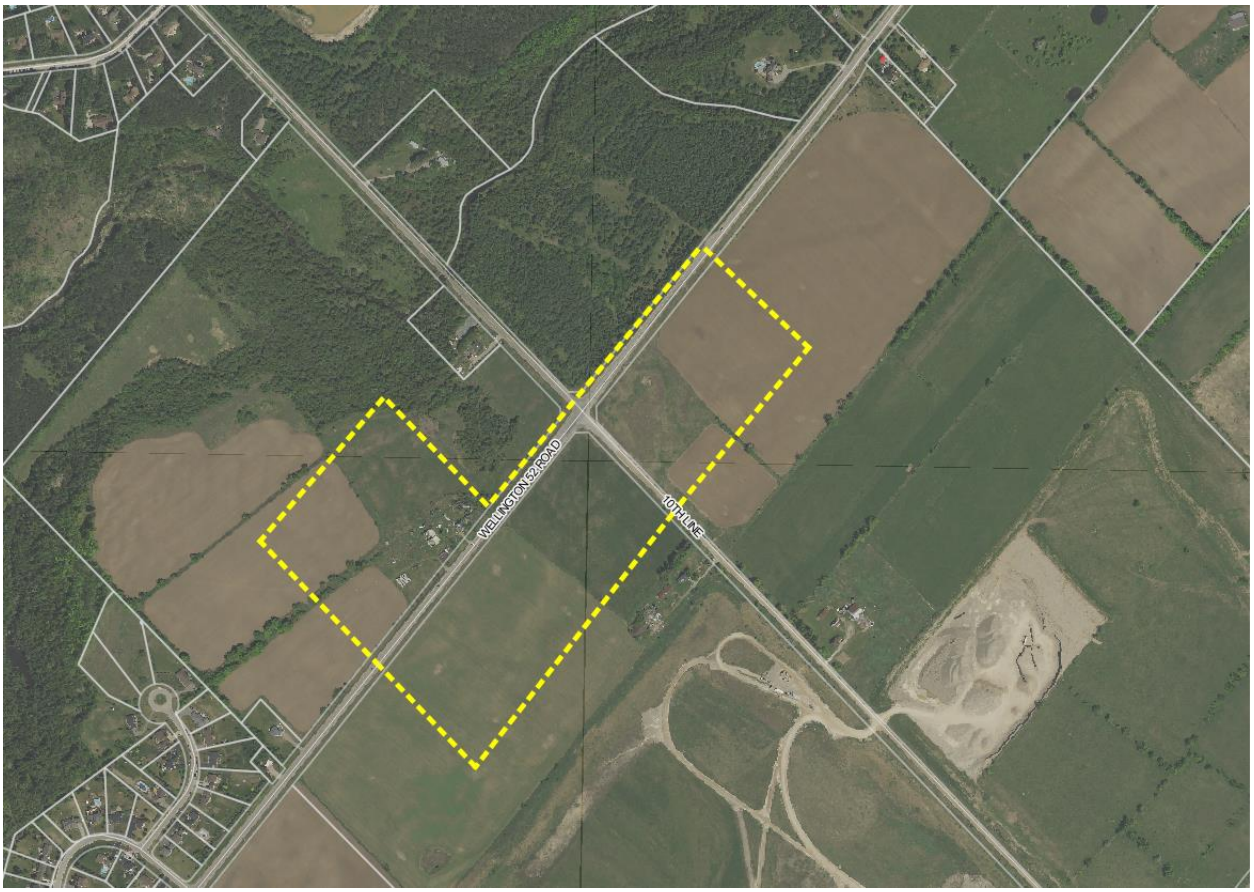

Figure 1 - Study Area for the potential location of the WWTP

3.0 Identification of Potential WWTP Sites

Having established the potential area for a WWTP site, it was necessary to determine the size of the site required to meet the effluent limits established under the ACS for a plant with a capacity of 7,172 m^3/d. While the plant capacity may be revised following completion of the UCWS Class EA study in line with a new Town Official Plan, the capacity of 7,172 m^3/d is seen as an ultimate capacity and typically, for long term infrastructure investments involving land purchase, it is considered prudent to purchase sufficient lands for the ultimate capacity. In addition, since this capacity represents full build out of the population including existing areas and new growth areas, it is likely that the plant will be constructed in Phases. For the purpose of this UCWS Class EA study it has been assumed that the treatment plant will be built in two phases. Within the site area, it will be necessary to reserve sufficient lands to enable construction of future phases in a safe manner without affecting operations.

Based on this, a preliminary plant layout was developed to identify the site area required. For a conventional plant with tertiary treatment constructed in two phases, it is likely that the plant areas would require approximately 150 m by 150 m of space including all of the ancillary buildings and facilities required by MOECC. The layout of this plant is shown in Figure 2.

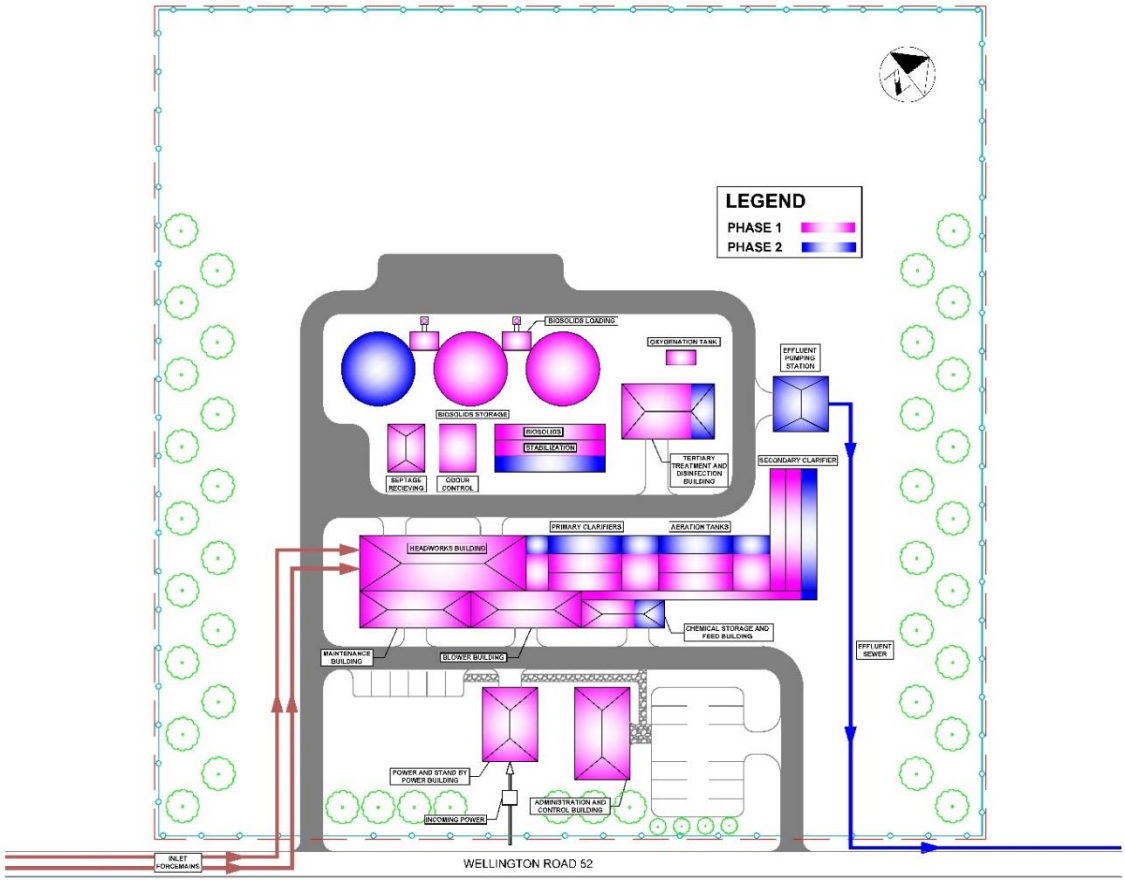

Figure 2 – WWTP Site Selection

Siting considerations for Sewage Works are outlined in Section 3.3 of the MOECC Design Guidelines for Sewage Works (2008). These considerations include:

- To be located as far as practical from any existing commercial or residential area or any area to be developed within the plant design life
- Should be separated from adjacent uses by a buffer zone
- To be above the 100 year flood event elevation
- To have a secure boundary with access to deal with emergencies
- The site should allow for:
    - Ease of construction
    - A phased approach
    - Maintaining operation during construction
    - Planning for future additions/expansions

MOECC also places limits on air and noise emissions governed by Section 9 of the Environmental Protection Act (EPA) and must demonstrate compliance at critical receptors (eg Residences)

Separation distances between Sewage Works and sensitive land use are specified in MOECC Guideline D2 “Compatibility between Sewage Treatment and sensitive land use” intended to mitigate the effects of odour and noise. Separation distances are measured between facility structures that could generate odour or noise and the property line of a sensitive land use. For treatment plants up to a capacity of 25,000 m3/d MOECC guidelines suggest a buffer zone of 150 m and not less than 100 m.

Since the area identified for a WWTP is agricultural/aggregate extraction with few homes, it is suggested that a 5 Ha site with dimensions of 225 m by 225 m would be sufficient and would allow approximately 40 m between tanks and the property boundary of the site with the rest of the buffer zone provided by the agricultural lands and environmentally sensitive lands around the sites. While this rectangular area is used to identify the preferred areas for the WWTP, The actual site boundary would be established through discussions between the Town and the site Owner at time of purchase.

Four (4) alternative sites for a WWTP have been identified for consideration and these are illustrated in Figure 3 and described below.

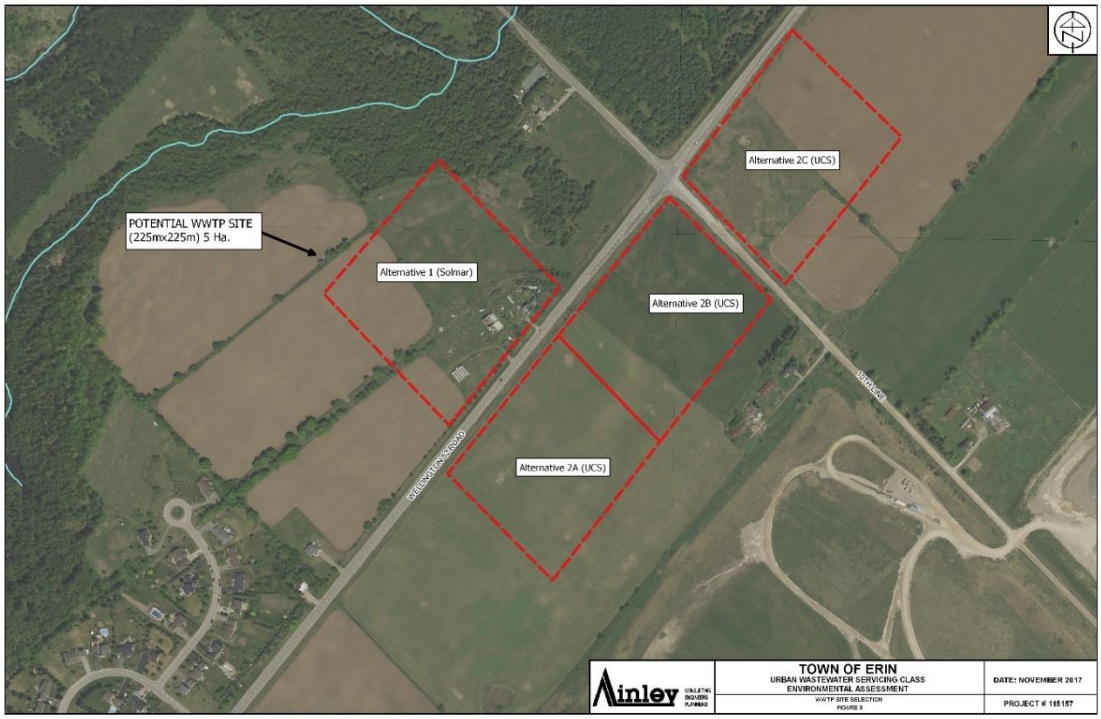

Figure 3 – Four Alternative Sites for WWTP

3.1. Alternative Sites

3.1.1 Alternative 1 – Solmar Site

Site 1 consists of an abandoned farmhouse and farm buildings and lands sloping down towards the West Credit River. Part of the site has been used to dispose of waste materials. Per Town of Erin Official Plan (Modified Schedule A-1), this site is located in a secondary agricultural zone. The site is also outside of the urban boundary and under the current Greenbelt Plan, it cannot be developed for residential or

commercial use. The site is part of a 200 acre farm property owned by Solmar Development Corporation (Solmar).

A meeting was held between the project team and Solmar to discuss the potential for use of the site as a WWTP. During the meeting, Solmar indicated that they are willing to sell sufficient property to the Town for construction of a WWTP. In fact, Solmar indicated that they had originally purchased the land for use as a WWTP site to service their development lands to the North. They had planned a discharge of treated effluent to the West Credit River. Solmar expressed no preference for where the WWTP would be located on their property, however it was agreed any potential site would be as far as possible from the existing McCullough Drive/Aspen Court subdivision and out of CVC regulated lands. Solmar indicated that they had not conducted any studies on the site and agreed to permit access to the project team to conduct archaeological, environmental and geotechnical studies. An agreement was executed to this effect. The results of these studies are summarised below.

Figure 4 – Site 1 (Solmar)

Environmental Impacts

A natural environment assessment was carried out at sites 1 (Solmar) and 2A and 2B (HSC) during June 2017 by Hutchinson Environmental Sciences Ltd (HESL).

Two species at risk, Bobolink and Eastern Meadowlark, were detected during bird surveys of these three proposed WWTP sites. On June 1, 2017 both species were heard in the fields on sites 2A and 2B, and Eastern Meadowlark was also heard on site 1. On June 21, 2017 Bobolink and Eastern Meadowlark were only heard on Sites 2A and 2B. Site 1 appears less suitable as breeding habitat, since it is more overgrown, with scattered shrubs. The fact that an Eastern Meadowlark was heard in this field only on the first visit suggests that the species is likely not using this habitat for breeding.

Savannah Sparrow, an area sensitive species, was also recorded in the fields of all sites. Its breeding habitat is considered Significant Wildlife Habitat (Open Country Bird Breeding Habitat) because this type of habitat is declining across Ontario and North America (MNRF 2015). As such, development and site alteration are only permitted if there will be no negative impacts on the natural features or their ecological functions (MMAH 2014).

One rare and uncommon plant species was observed within Site 1 (Wild Geranium), while four rare and uncommon plant species were associated with the adjacent West Credit PSW complex: Yellow Sedge, Turtlehead, White Spruce, and Bristly Buttercup.

The HESL report forms part of the project documentation.

Heritage / Archaeological Impacts

A Cultural Heritage Resource Assessment was conducted by Archaeological & Cultural Heritage Services Inc. (ASI) as part of this project. A field review of the study area was undertaken by ASI on July, 19 2017. Based on the results of this assessment, no significant impacts to cultural heritage resources is anticipated as a result of the adoption of this site for the Wastewater Treatment Plant.

A Stage 1 Archaeological Assessment of the site was conducted by ASI including a field inspection on June 22, 2017. No excavation was conducted during this inspection which concluded that the site exhibited archaeological potential. As such, the site requires a Stage 2 Archaeological Assessment by test pits prior to any proposed construction on the property.

Both ASI reports form part of the project documentation.

Geotechnical Impacts

A geotechnical investigation was conducted by GeoPro Consulting Limited during October 2017. Four boreholes we completed to assess the suitability for construction of a WWTP. The results indicate that the site is underlain by sands and gravel deposits that provide an adequate foundation for all WWTP structures. Construction would not be impacted by groundwater or rock.

The GeoPro Consulting Limited Geotechnical Report forms part of the project documentation.

Cost Impacts

In order to compare the capital costs of the four (4) sites, the following was considered:

- Relative lengths of forcemain to convey wastewater to each site
- Estimated purchase cost of the site
- Costs associated with any unique development features for each site
- Costs to convey treated wastewater to the preferred outfall site.

As previously noted, all of the sites will require an inlet forcemain conveying wastewater from the collection system and an effluent pumping station to convey treated effluent to the preferred outfall site at Winston Churchill Boulevard. The inlet and outlet forcemains are the same diameter. To establish the cost of these inlet/outlet pipes relative to each site, the inlet cost was taken from a point to the west of site 1 and 2A and the outlet cost was taken to a point to the east of site 2C.

For site 1, the inlet forcemain location will be approximately the same as for site 2A (taken as zero). Outlet forcemain costs will be assumed to a common point beyond site 2C. For site 1 a cost has also been estimated to conduct necessary studies prior to purchase including and Environmental Site Assessment (ESA), Archaeological Stage 2 Study as well as clean up and demolition of the existing structures.

Table 1 - Site 1 Estimated Capital Cost

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Site Studies/Clean Up/Demolitions	$ 150,000
Inlet/Outlet Forcemains	$ 425,000
Total	**$ 785,000**

Table 2 - Advantages and Disadvantages of Site 1

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately adjacent Wellington Road 52. ▪ The elevations across the site are adequate to support design of gravity flow through the WWTP. ▪ The Owner is willing to sell the land to the Town for a WWTP. ▪ The site is mostly not presently farmed or used for any agricultural purpose. ▪ Topography will allow the main plant processes to be hidden from Wellington Road 52 and from the subdivision to the west. ▪ The distance between the nearest WWTP structure and the home on 10th Line exceeds 200 m which is greater than the MOECC buffer zone requirement ▪ The distance between the nearest WWTP structure and the home east of the McCullough Drive/Aspen Court subdivision is over 290 m and also exceeds the MOECC buffer zone requirement.	▪ Use of this site will require cleanup of materials deposited on the site and this will likely require an Environmental Site Assessment Study prior to purchase. ▪ The use of this site will require a Stage 2 Archaeological Assessment prior to purchase. ▪ The Town may have to purchase more than 5 Ha as remaining lands may not be useful to the present Owner. ▪ An entrance permit onto Wellington Road 52 will be necessary from the County.

3.1.2 Alternative 2A, 2B and 2C –Halton Crushed Stone Sites

Site 2A consists of farmland on the south side of Wellington Road 52 generally opposite Site 1 and would be accessed off Wellington Road 52. Site 2B also consists of farmland at the south west corner of Wellington Road 52 and 10th Line. Site 2C consists of farmland at the south east corner of Wellington Road 52 and 10th Line. Site 2C was added for consideration after completion of the natural environment report, however, the area is similar to sites 2A and 2B and a previous environmental report (completed as

part of the aggregate extraction application) covered all three sites. Per Town of Erin Official Plan (Modified Schedule A-1), these sites are located in a secondary agricultural zone. The sites are also outside of the urban boundary and under the current Greenbelt Plan, cannot be developed for residential or commercial use. The sites are owned by Halton Crushed Stone (HCS), part of the Crupi Group, who have an application for extraction of sand and gravel covering all three sites, as an extension to their operation to the south of the sites.

A meeting was held between the project team and HCS to discuss the potential for use of these sites as a WWTP. During the meeting, HCS indicated that they are willing to sell sufficient property to the Town for construction of a WWTP subject to the following considerations:

- It is undesirable to HCS to sell a portion of their lands that have not been mined for the underlying aggregate resources. The lands represent an opportunity to maintain stable employment for many people. Should the Town wish to purchase the unmined lands, the value of the underlying resource would need to be taken into consideration.
- The identified sites have not been mined by HCS for their aggregate resources. The sites are within the extraction area for which HCS is in the process of obtaining approval for extraction. Based on current mining plans, it is possible the area would be actively mined for between 5 to 10 years depending on market conditions, however HCS could not confirm a schedule for extraction on the site.
- Depending on the timeline for a wastewater system, the lands could be fully mined before required by the Town, however this cannot be guaranteed by HCS.

HCS has completed extensive studies covering these sites including resource development plans, archaeological report, natural environment report, hydrogeological report, noise report, planning report, and transportation brief. HCS made all of their reports available to the project team.

During the visit to the HCS facility the project team observed the mined and restored area. To mitigate the impact on habitat for species at risk, HCS have completed extensive restoration of mined areas. It is likely that similar mitigation would be required if these sites are developed as a WWTP. Mitigation would likely involve setting aside lands to compensate for loss of habitat.

The sites are part of an application by HCS to extend their present operation. Their application covers some 56.7 Ha for extraction involving the recovery of some 4 to 5 million tonnes of sand and gravel at a rate of some 725,600 tonnes per year. The area represents a key sand and gravel resource generating high quality granular A and B as well as stone and sand. It would appear that the sites are underlain by up to 5 m of extractable sand and gravel.

Based on the plan to extract some 4 to 5 million tonnes over 56.7 Ha, it is reasonable to assume that a 5 Ha site would be underlain by some 400,000 tonnes of extractable sand and gravel. The commercial value of this resource is estimated at $5/tonne (typical pick up cost for Granular B and sand in the GTA) which means that the resource under each of site 2A, 2B and 2C can be valued at $2,000,000.

Since purchase of these sites cannot be guaranteed to meet the project timeline if they have the aggregate resource extracted, for the purpose of comparing the sites it is assumed that the Town would have to purchase the sites before extraction and therefore have to pay the commercial value of the land. In addition, since there is an active application for approval of aggregate extraction in place, the assumption that they would be mined before use as a WWTP, implies approval of the mining application.

It can also be noted that following extraction the sites are left as basically flat sites just above the groundwater table which does not make them ideal for construction of a WWTP.

Since the timeline of the project cannot be fixed with certainty, a comparison has also been completed assuming that the aggregate has been removed prior to purchase.

Figure 5 – Site 2A (HCS)

Figure 6 – Site 2B (HCS)

Figure 7 – Site 2C (HCS)

The results of field studies are summarised below.

Environmental Impacts

A Level 1 and Level 2 Natural Environment Technical Report was completed in 2016 by WSP on behalf of Halton Crushed Stone as part of their application for sand and gravel extraction covering all three sites. This study identified three Provincially and Federally listed bird species at risk on the sites including the barn swallow, bobolink and eastern meadowlark. The report recommends progressive rehabilitation of habitat as the extraction proceeds to minimise the impact on these species.

A natural environment assessment was carried out at the sites during June 2017 by Hutchinson Environmental Sciences Ltd as part of the UCWS Class EA. Two species at risk, Bobolink and Eastern Meadowlark, were detected during bird surveys on sites 2A and 2B. On June 1, 2017 both species were heard in the fields on sites 2A and 2B. On June 21, 2017 Bobolink and Eastern Meadowlark were also heard on Sites 2A and 2B. Sites 2A and 2B represent potential breeding habitat for both Bobolink and Eastern Meadowlark. These species breed in grassland habitat, such as farm fields, uncut pastures and meadows. This also likely applies to site 2C.

Savannah Sparrow, an area sensitive species, was also recorded in the fields of all sites. Its breeding habitat is considered Significant Wildlife Habitat (Open Country Bird Breeding Habitat) because this type of habitat is declining across Ontario and North America (MNRF 2015). As such, development and site alteration are only permitted if there will be no negative impacts on the natural features or their ecological functions (MMAH 2014).

Heritage / Archaeological Impacts

The sites are all owned by an aggregate extraction company who is actively seeking approval to extract aggregates from the sites. Aggregate extraction is a significant local industry and a potential source of employment in the Town.

An Archaeological assessment was completed in 2002 on all three Halton Crushed Stone sites by Archaeologix Inc. on behalf of Dufferin Aggregates application to expand the aggregate extraction area. One area with significant mid-19th Century artifacts was located close to site 2C. Stage 2 and Stage 3 Assessments were conducted at this location and a recommendation for a Stage 4 assessment was made prior to aggregate extraction.

A Cultural Heritage Resource Assessment was conducted by Archaeological & Cultural Heritage Services Inc. (ASI) as part of this project. A field review of the study area of sites 2A and 2B was undertaken by ASI on July, 19 2017. Based on the results of this assessment, no significant impacts to cultural heritage resources is anticipated as a result of the adoption of sites 2A or 2B for the Wastewater Treatment Plant.

The ASI report forms part of the project documentation.

Geotechnical Impacts

The sites are underlain by sand and gravel which is being extracted to just above the water table. Prior to extraction it is anticipated that the soils would provide excellent foundation materials with little requirement for a “Permit to Take Water” for construction dewatering or for structures to counteract buoyancy forces. Following extraction of the aggregates it is likely that dewatering would be required during construction and structures would need to have increased weight to counteract buoyancy.

Cost Impacts

Below, estimated capital costs and advantages/disadvantages are shown for each of the three Halton Crushed Stone sites both before and after resource extraction.

For site 2A, the inlet forcemain location will be approximately the same as for site 1. Table 3 shows the relative length of the inlet and outlet forcemains. The cost of land purchase is assumed to be the same as for site 1 based on agricultural use. It is assumed that the Town would also have to pay for the aggregate resource.

Table 3 - Site 2A Estimated Capital Cost Prior to Resource Extraction

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Value of Aggregate Resources	$ 2,000,000
Inlet/Outlet Forcemains*	$ 455,000
Total	**$ 2,665,000**

Table 4 - Advantages and Disadvantages of Site 2A

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately adjacent Wellington Road 52. ▪ The WWTP can be constructed more than 200 m from any residences.	▪ Site topography may not provide adequate space to support gravity flow through the WWTP as elevations drop off considerably to the west. ▪ The site is mainly at a high elevation and the site would be highly visible. ▪ Species at risk have been identified on the site and any development may require habitat compensation. ▪ Additional land purchase may be needed for habitat compensation. ▪ An entrance permit onto Wellington Road 52 will be necessary from the County.

Table 5 - Site 2A Estimated Capital Cost Following Resource Extraction

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Inlet/Outlet Forcemains	$ 455,000
Total	**$ 665,000**

It is assumed that in purchasing the lands for the WWTP site following resource extraction, HCS would have already provided rehabilitation compensation for the species at risk over their other lands.

It should also be noted that, following extraction, the flat site just above the groundwater table will add to the cost of construction both in terms of having to provide considerable dewatering within sand and gravel during construction and in additional structural weight (concrete) to offset the effects of buoyancy when constructing tanks below the groundwater table. Alternatively the facilities could be constructed above the water table on imported fill which would also add to cost.

Table 6 - Advantages and Disadvantages of Site 2A Following Resource Extraction

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately adjacent Wellington Road 52. ▪ The WWTP can be constructed more than 200 m from any residences. ▪ The plant could be hidden from view in the extracted area	▪ Site topography will be flat following aggregate extraction which does not support gravity flow through plant. ▪ Construction may be affected by the groundwater table which can add to costs for dewatering and structural work. ▪ HCS cannot provide a date when the resource extraction will be completed and so this alternative does not provide a valid solution at this time.

For site 2B, the inlet forcemain location will be longer than for site 1 and 2A, however the outlet forcemain would be shorter and effluent would still require pumping. The cost of land purchase is assumed to be the same as for site 1 based on agricultural use. It is assumed that the Town would also have to pay for the aggregate use.

Table 7 - Site 2B Estimated Capital Cost Prior to Resource Extraction

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Value of Aggregate Resources	$ 2,000,000
Inlet/Outlet Forcemains	$ 440,000
Total	**$ 2,650,000**

Table 8 - Advantages and Disadvantages of Site 2B Prior to Resource Extraction

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately with an access off 10th Line. ▪ The elevations across the site are adequate to support design of gravity flow through the WWTP. ▪ Topography will allow the main plant processes to be partly hidden from Wellington Road 52. ▪ The WWTP can be constructed more than 200 m from any residences and represents the site with the greatest buffer zone	▪ HCS may wish to mine 10th Line which could affect access or outlet forcemain design. ▪ Species at risk have been identified on the site. ▪ Additional land purchase may be needed for habitat compensation.

Table 9 - Site 2B Estimated Capital Cost Following Resource Extraction

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Inlet/Outlet Forcemains	$ 440,000
Total	**$ 650,000**

Table 10 - Advantages and Disadvantages of Site 2B Following Resource Extraction

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately with an access off either Wellington Road 52 or 10th Line. ▪ The plant could be hidden from view in the extracted area. ▪ The WWTP can be constructed more than 200 m from any residences and represents the site with the greatest buffer zone	▪ Site topography will be flat following aggregate extraction which does not support gravity flow through plant. ▪ Construction may be affected by the groundwater table which can add to costs for dewatering and structural work. ▪ HCS cannot provide a date when the resource extraction will be completed and so this alternative does not provide a valid solution at this time.

For site 2C, the inlet forcemain location will be longer than for site 1 and 2A/2B, however the outlet forcemain would be shorter and effluent would still require pumping. The cost of land purchase is assumed to be the same as for site 1 based on agricultural use. It is assumed that the Town would also have to pay for the aggregate use prior to extraction.

Table 11 - Site 2C Estimated Capital Cost Prior to Resource Extraction

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Value of Aggregate Resources	$ 2,000,000
Inlet/Outlet Forcemains	$ 460,000
Total	**$ 2,670,000**

Table 12 - Advantages and Disadvantages of Site 2C Prior to Resource Extraction

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately with an access off 10th Line. ▪ The elevations across the site are adequate to support design of gravity flow through the WWTP. ▪ The WWTP can be constructed more than 200 m from any residences and represents the site with the greatest buffer zone	▪ HCS may wish to mine 10th Line which could affect access or outlet forcemain design. ▪ Species at risk have been identified on the site ▪ Additional land purchase may be needed for habitat compensation. ▪ Topography and location make this a fairly visible site that will not allow the main plant processes to be hidden from Wellington Road 52 unless berms are constructed. ▪ An archaeological site has been identified close to this site. ▪ The site is closer to residences on Wellington Road 52 downwind of prevailing winds

Table 13 - Site 2C Estimated Capital Cost Following Resource Extraction

Cost Component	Estimated Capital Cost
Land Purchase	$ 210,000
Inlet/Outlet Forcemains	$ 460,000
Total	**$ 670,000**

Table 14 - Advantages and Disadvantages of Site 2C Following Resource Extraction

Advantages	Disadvantages
▪ Sufficient space is available for the WWTP immediately with an access off 10th Line. ▪ The plant could be hidden from view in the extracted area. ▪ The WWTP can be constructed more than 200 m from any residences and represents the site with the greatest buffer zone	▪ HCS may wish to mine 10th Line which could affect access or outlet sewer design. ▪ Additional archaeological discoveries could delay the project and add to cost. ▪ Site topography will be flat following aggregate extraction which does not support gravity flow through plant. ▪ Construction may be affected by the groundwater table which can add to costs for dewatering and structural work. ▪ HCS cannot provide a date when the resource extraction will be completed and so this alternative does not provide a valid solution at this time.

4.0 Evaluation Methodology

The evaluation methodology used to select the preferred solution for the WWTP site was established in a manner consistent with the principles of environmental assessment planning and decision-making as outlined in Municipal Class Environmental Assessment.

A decision model consistent with the principles of environmental assessment planning and decision making as outlined in Municipal Class Environmental Assessment manual was developed to select the preferred site.

Since the sites are all in a similar area and have similar characteristics, specific evaluation criteria were identified and compared distinguishing features between the sites. Whereas other components of the UCWS Class EA place a higher emphasis on Technical Criteria, for the site selection evaluation, Environmental and Economic Criteria play a more important role.

Based on the above, the four (4) Alternative Sites (Site 1, 2A, 2B and 2C) will be evaluated against the specific evaluation criteria described in the Table 15 below:

Table 15 - WWTP Site Evaluation Criteria

Primary Criteria	Weight	Secondary Criteria	Weight
Social/Culture	15%	Impacts During Construction	20%
		Aesthetics	30%
		Effect on Residential Properties	30%
		Effect on Businesses/ Commercial Properties	10%
		Effect on Industrial Properties	10%
Technical	10%	Suitability of Elevation and Topography	50%
		Suitability for Phasing	20%
		Construction Impacts	20%
		Operation and Maintenance Impacts	10%
Economic	25%	Capital Cost	30%
Environmental	50%	Effect on Habitat/ Wildlife	30%
		Effect on Vegetation/ Wetlands	30%
		Effect on Groundwater	20%
		Effect on Surface Water/ Fisheries	20%

4.1. Screening Criteria Definitions

4.1.1 Social/Culture, Impacts During Construction

This criterion captures the level of disturbance to the community the proposed solution will have during the construction period. These effects include noise levels, vibration, odours, dust production, as well as the amount of time for which these disturbances will persist.

4.1.2 Social/Culture, Aesthetics

This criterion captures the level of impact from the visual appearance of the plant on local residents and traffic on Wellington Road 52.

4.1.3 Social/Culture, Effect on Residential Properties

This criterion captures the level of impact that establishing and maintaining a WWTP on the site, has on individual residential properties. Impacts considered include, traffic (septage receiving, chemicals and other deliveries as well as sludge haulage), lighting, odour and noise from the operating plant.

4.1.4 Social/Culture, Effect on Commercial Properties

This criterion captures the level of impact that establishing and maintaining a WWTP on the site, has on individual commercial properties. Impacts considered include, traffic (septage receiving, chemicals and other deliveries as well as sludge haulage), lighting, odour and noise from the operating plant.

4.1.5 Social/Culture, Effect on Industrial Properties

This criterion captures the level of impact that establishing and maintaining a WWTP on the site has on individual industrial properties. Impacts considered include, traffic (septage receiving, chemicals and other deliveries as well as sludge haulage), lighting, odour and noise from the operating plant.

4.1.6 Technical, Suitability of Elevation and Topography

Typically the flow through WWTP processes is by gravity. Wastewater will be pumped to the WWTP and effluent will be pumped to the West Credit River at Winston Churchill Boulevard. The elevation and topography of potential sites therefore impacts the suitability of the site.

4.1.7 Technical, Suitability for Phasing

This criterion captures the capacity of the WWTP to be expanded under a phased development plan. Sites that allow flexibility in WWTP development to promote ease of expansion would have a lower impact on expandability.

4.1.8 Technical, Construction Impacts

This criterion captures the constructability of the WWTP on the potential sites. This would include geotechnical aspects and hydrogeological aspects affecting structural design of the WWTP.

4.1.9 Technical, Operational and Maintenance Impacts

This criterion captures the impacts of each site on the operability of the WWTP. This would take into consideration, access to the site, ability to deal with weather events, prevailing winds, potential for flooding and level of effort required by operations staff to operate and maintain the system on the site.

4.1.10 Economic, Capital Cost

For upfront purchase of lands to construct the WWTP the main issue is capital cost. There is minimal ongoing cost associated with the WWTP site. Site comparison is presented on the basis of relative capital costs for each site. All sites will have a similar cost for earthworks, landscaping and plant development not included in the comparative analysis

4.1.11 Environmental, Effect on Habitat/ Wildlife

The criterion captures the impact that the establishment and operation of the site has on the local habitat and wildlife both during construction and over the long term. Minimizing negative impacts of the local habitat and wildlife is rated favourably.

4.1.12 Environmental, Effect on Vegetation/ Wetlands

The criterion captures the impact that the establishment and operation of the site has on the local vegetation and wetlands both during construction and over the long term. Minimizing negative impacts on the local vegetation and wetlands is rated favourably.

4.1.13 Environmental, Effect on Groundwater

The criterion captures the level of groundwater impacts associated with the site and proximity to source water protection zones. Minimizing contamination of the local groundwater is rated favourably.

4.1.14 Environmental, Effect on Surface Water/ Fisheries

The criterion captures the impact that the establishment and operation of the site has on the local surface waters both during construction and over the long term. Minimizing contamination of the local surface water is rated favourably.

5.0 Evaluation of Alternatives Sites

5.1. Detailed Evaluation of Site Alternatives

The evaluation of the four (4) potential WWTP sites, using the criteria and weightings listed in Table 15 was completed based on:

- The present site conditions prior to resource extraction. The evaluation is provided in Table 16.
- The site conditions following resource extraction. The evaluation is provided in Table 17.

Based on detailed evaluation of the alternatives, Site No 1 (Solmar) has the highest score prior to resource extraction and is identified as the preferred alternative based on present site conditions. Following resource extraction, Site 2B (HCS) has the highest score and is identified as the preferred alternative following resource extraction.

The details of the scoring and rationale have been provided in Table 18.

Table 16 – Evaluation Matrix for Short Listed Wastewater Treatment Plant Site Alternatives (Prior to Aggregate Extraction)

Primary Criteria		Secondary Criteria		Absolute Weight (WT)	Site 1 (Solmar)		Site 2A (HCS) Prior to Extraction		Site 2B (HCS) Prior to Extraction		Site 2C (HCS) Prior to Extraction		Comments Prior to Aggregate Extraction on Sites 2A, 2B, 2C
Criteria	Weight	Criteria	Weight		Score	WT Score	Score	WT Score	Score	WT Score	Score	WT Score	
Social/Culture	15%	Impacts During Construction	20%	3	5	3	5	3	4	2.4	4	2.4	Site 2B/2C may impact access to HCS operation
		Aesthetics	30%	4.5	5	4.5	1	0.9	4	3.6	3	2.7	Site 2A and 2C most visible. Site 1 can be completely hidden from view
		Effect on Residential Properties	30%	4.5	4	3.6	2	1.8	5	4.5	3	2.7	Buffer zone for Site 2B is greater so less effect
		Effect on Businesses/ Commercial Properties	10%	1.5	5	1.5	5	1.5	5	1.5	5	1.5	Minimal Effect from any alternative
		Effect on Industrial Properties	10%	1.5	5	1.5	2	0.6	2	0.6	2	0.6	Site 2A and 2B affect aggregate resource
Technical	10%	Suitability of Elevation and Topography	50%	5	5	5	4	4	5	5	4	4	All similar with good topography. All sites require effluent pumping
		Suitability for Phasing	20%	2	5	2	5	2	5	2	5	2	All sites good
		Construction Impacts	20%	2	4	1.6	4	1.6	4	1.6	4	1.6	All should have low impacts. All use same roads.
		Operation and Maintenance Impacts	10%	1	5	1	5	1	4.5	0.9	4.5	0.9	All similar good sites with access for deliveries and maintenance
Environmental	50%	Effect on Habitat/Wildlife	30%	15	4	12	3	9	3	9	3	9	All impact bird habitat and may require compensation
		Effect on Vegetation/Wetlands	30%	15	4	12	4	12	4	12	4	12	All impact agricultural lands. Site 1 impact rare species
		Effect on Groundwater	20%	10	4	8	4	8	3	6	3	6	May be a small effect on groundwater flow to River
		Effect on Surface Water/Fisheries	20%	10	5	10	5	10	5	10	5	10	Little effect anticipated
Economic	25%	Capital Cost	100%	25	5	25	2	10	2	10	2	10	Site 2A, 2B and 2C costs include land aggregate resource cost
			TOTAL SCORE	**100**		**90.7**		**65.4**		**69.1**		**65.4**	

Based on the above evaluation, Site 1 (Solmar) is the preferred site prior to aggregate extraction.

Table 17 – Evaluation Matrix for Short Listed Wastewater Treatment Plant Site Alternatives (Following Aggregate Extraction)

Primary Criteria		Secondary Criteria		Absolute Weight (WT)	Site 1 (Solmar)		Site 2A (HCS) Following Extraction		Site 2B (HCS) Following Extraction		Site 2C (HCS) Following Extraction		Comments Following Aggregate Extraction on Sites 2A, 2B, 2C
Criteria	Weight	Criteria	Weight		Score	WT Score	Score	WT Score	Score	WT Score	Score	WT Score	
Social/Culture	15%	Impacts During Construction	20%	3	5	3	5	3	4.5	2.7	4.5	2.7	Site 2B/2C may impact access to HCS operation
		Aesthetics	30%	4.5	5	4.5	3	2.7	5	4.5	3	2.7	Site 2A and 2C most visible. Site 1 can be completely hidden from view
		Effect on Residential Properties	30%	4.5	4	3.6	2	1.8	5	4.5	3	2.7	Buffer zone for Site 2B is greater so less effect
		Effect on Businesses/ Commercial Properties	10%	1.5	5	1.5	5	1.5	5	1.5	5	1.5	Minimal Effect from any alternative
		Effect on Industrial Properties	10%	1.5	5	1.5	5	1.5	5	1.5	5	1.5	Assuming aggregates removed effect will be minimal
Technical	10%	Suitability of Elevation and Topography	50%	5	5	5	3	3	3	3	3	3	Aggregate removal causes groundwater and structural issues
		Suitability for Phasing	20%	2	5	2	5	2	5	2	5	2	All sites good
		Construction Impacts	20%	2	4	1.6	4	1.6	4	1.6	4	1.6	All should have low impacts. All use same roads.
		Operation and Maintenance Impacts	10%	1	5	1	5	1	4.5	0.9	4.5	0.9	All similar good sites with access for deliveries and maintenance
Environmental	50%	Effect on Habitat/Wildlife	30%	15	4	12	5	15	5	15	5	15	Assume bird habitat restored after aggregate extraction on 2A, 2B and 2C
		Effect on Vegetation/Wetlands	30%	15	4	12	5	15	5	15	5	15	All impact agricultural lands. Site 1 impact rare species
		Effect on Groundwater	20%	10	5	10	4	8	4	8	4	8	Effect on groundwater flow to River increased with aggregate extraction
		Effect on Surface Water/Fisheries	20%	10	5	10	5	10	5	10	5	10	Potential effect increased with aggregate extraction
Economic	25%	Capital Cost	100%	25	4	20	4	20	4	20	4	20	Little cost difference after aggregate extraction
			TOTAL SCORE	100		87.7		86.1		90.2		86.6	

Based on the above evaluation, Site 2B (HCS) is the preferred site following aggregate extraction.

Table 18 – Criteria Rating Rationale

Criteria	Site 1 (Solmar)	Site 2A (HCS)	Site 2B (HCS)	Site 2C (HCS)
Social/ Culture - Impacts During Construction	▪ It is anticipated that the site is sufficiently remote from the existing community that the effects of dust, noise, will not impact the community to any great degree ▪ Traffic impact can be mitigated by specifying haul routes and likely can avoid urban areas ▪ Stage 2 Archaeological Study required	▪ Same as site 1 ▪ Similar impacts after aggregate extraction	▪ Same as site 1 ▪ Development of site 2B on 10th Line may impact access to HCS operations ▪ Similar impacts after aggregate extraction	▪ Same as site 1 ▪ Development of site 2C on 10th Line may impact access to HCS operations ▪ Similar impacts after aggregate extraction ▪ Potential for additional archaeological resources to be found
Social/ Culture - Aesthetics	▪ Due to the site sloping to the north it will be possible to minimize impact from Wellington Road 52 ▪ The subdivision to the west will likely be completely hidden from the WWTP	▪ The site is at the highest elevation in the area and it would likely be highly visible from Wellington Road 52 and from the subdivision to the west ▪ This site would have a significant aesthetic impact despite attempts to mitigate through landscaping and planting ▪ Following extraction the site would be less visible but still likely in view of road	▪ This site has the potential to have the least aesthetic impact on the area ▪ Natural topography can shield the WWTP from Wellington Road 52 and the subdivision to the west ▪ It would have a small aesthetic impact on homes to the east of 10th Line ▪ Following extraction would be even less visible	▪ The site is at the corner of Wellington Road 52 and 10th Line and visible from both roads and to homes to the east ▪ This site would have an aesthetic impact despite attempts to mitigate through landscaping and planting ▪ Following extraction the site would be less visible but still likely in view of roads
Social/ Culture - Effect on Residential	▪ This site could potentially impact the McCullough	▪ This site could potentially impact the McCullough	▪ This site would potentially have little impact on	▪ This site could potentially impact several homes to

Criteria	Site 1 (Solmar)	Site 2A (HCS)	Site 2B (HCS)	Site 2C (HCS)
Properties	Drive/Aspen Court subdivision and a single home on 10th Line ▪ Buffer distances exceed MOECC recommended distances and additional mitigation can be put in place to comply with noise and odour limitations ▪ Prevailing winds are away from the subdivision	Drive/Aspen Court subdivision ▪ Buffer distances exceed MOECC recommended distances and additional mitigation can be put in place to comply with noise and odour limitations ▪ Prevailing winds are away from the subdivision ▪ Aggregate extraction would not significantly change potential impacts	residential developments. ▪ Buffer distances exceed MOECC recommended distances and additional mitigation can be put in place to comply with noise and odour limitations. ▪ Prevailing winds are away from the subdivision ▪ Aggregate extraction would not significantly change potential impacts	the east ▪ Buffer distances exceed MOECC recommended distances and additional mitigation can be put in place to comply with noise and odour limitations ▪ Prevailing winds are generally in the direction of the homes on the south side of Wellington Road 52 ▪ Aggregate extraction would not significantly change potential impacts
Social/ Culture - Effect on Businesses/ Commercial Properties	▪ There are few commercial businesses within the area of the site and a WWTP on this site would have little impact on commercial properties	▪ Same as site 1	▪ Same as site 1	▪ Same as site 1
Social/ Culture - Effect on Industrial Properties	▪ There are no industrial businesses within the area of the site and a WWTP on this site would have little impact on industrial properties	▪ The site is zoned for aggregate extraction and development of this site prior to extraction, would negatively impact the commercial value of the site	▪ Same as 2A	▪ Same as 2A
Technical - Suitability of Elevation and Topography	▪ Site 1 is sufficiently above the river and flood level. ▪ Site 1 provides topography	▪ Site 2A is sufficiently above the river and flood level.	▪ Site 2B is sufficiently above the river and flood level. ▪ Site 2B provides topography	▪ Site 2C is sufficiently above the river and flood level. ▪ Site 2C provides

Criteria	Site 1 (Solmar)	Site 2A (HCS)	Site 2B (HCS)	Site 2C (HCS)
	sloping to the north sufficient to maintain gravity flow through all of the treatment processes while screening them from the road. ▪ Site will need to have debris cleaned from the site prior to construction.	▪ Site 2A provides topography sloping to the south sufficient to maintain gravity flow through all of the treatment processes ▪ Aggregate extraction would result in a flat site just above the groundwater table making it more costly to construct the plant	sloping to the south east sufficient to maintain gravity flow through all of the treatment processes while screening them from the road. ▪ Same as site 2A	topography sloping to the south east sufficient to maintain gravity flow through all of the treatment processes ▪ Same as site 2A
Technical - Suitability for Phasing	▪ Site supports phasing as shown in figure 2	▪ Site supports phasing as shown in figure 2	▪ Site supports phasing as shown in figure 2	▪ Site supports phasing as shown in figure 2
Technical - Construction Impacts	▪ Construction traffic flow to the site should not have a major impact on the community ▪ Site is sufficiently far from residential properties that dust and noise should not impact them ▪ The soils underlying the site form adequate foundation material and avoid added cost of dewatering and rock removal	▪ As site 1 ▪ Aggregate removal to just above the water table will add to the construction cost	▪ As site 1 ▪ Aggregate removal to just above the water table will add to the construction cost	▪ As site 1 ▪ Aggregate removal to just above the water table will add to the construction cost
Technical - Operation and Maintenance Impacts	▪ Site has good access for deliveries, maintenance and dealing with emergencies ▪ Sufficient space to	▪ As site 1 ▪ Aggregate removal will detract from site access	▪ As site 1	▪ As site 1 ▪ Aggregate removal will detract from site access

Criteria	Site 1 (Solmar)	Site 2A (HCS)	Site 2B (HCS)	Site 2C (HCS)
	accommodate all MOECC requirements ▪ The elevation and slope of the site should be able to deal with design weather events			
Economic - Capital Cost	▪ This site has the least capital cost prior to aggregate extraction ▪ The Owner of the site is willing to sell the site to meet the project schedule	▪ Sites 2A, 2B and 2C have a similar cost prior to extraction which is substantially higher than site 1 cost ▪ The Owner of the site is not willing to sell the site to meet the project schedule, however would be willing to sell the site after mining which would lower the capital cost ▪ Following aggregate extraction the site is likely less costly to purchase but more costly to develop	▪ Sites 2A, 2B and 2C have a similar cost prior to extraction which is substantially higher than site 1 cost ▪ The Owner of the site is not willing to sell the site to meet the project schedule, however would be willing to sell the site after mining which would lower the capital cost ▪ Following aggregate extraction the site is likely less costly to purchase but more costly to develop	▪ Sites 2A, 2B and 2C have a similar cost prior to extraction which is substantially higher than site 1 cost ▪ The Owner of the site is not willing to sell the site to meet the project schedule, however would be willing to sell the site after mining which would lower the capital cost ▪ Following aggregate extraction the site is likely less costly to purchase but more costly to develop
Environmental - Effect on Habitat/ Wildlife	▪ Each of the four proposed WWTP site locations contained sensitive features ▪ Two threatened bird species observed on site but not considered to be breeding on site ▪ Provides wildlife habitat for an area sensitive grassland	▪ Each of the four proposed WWTP site locations contained sensitive features ▪ Two threatened bird species observed on site and considered to be breeding on site ▪ Mitigation to protect	▪ Each of the four proposed WWTP site locations contained sensitive features ▪ Two threatened bird species observed on site and considered to be breeding on site ▪ Mitigation to protect threatened species must be	▪ Each of the four proposed WWTP site locations contained sensitive features ▪ Two threatened bird species observed on site and considered to be breeding on site ▪ Mitigation to protect

Criteria	Site 1 (Solmar)	Site 2A (HCS)	Site 2B (HCS)	Site 2C (HCS)
	species (Savannah Sparrow) ▪ Mitigation to protect threatened species must be implemented	threatened species must be implemented	implemented	threatened species must be implemented
Environmental - Effect on Vegetation/ Wetlands	▪ One rare and uncommon plant growing on site (Wild Geranium) ▪ Four rare plant species in adjacent wetland	▪ Farmed grassland fields. No anticipated impact	▪ Farmed grassland fields. No anticipated impact	▪ Farmed grassland fields. No anticipated impact
Environmental - Effect on groundwater	▪ Unlikely to affect groundwater flow and effects can be mitigated	▪ Unlikely to affect groundwater flow and effects can be mitigated	▪ Unlikely to affect groundwater flow and effects can be mitigated	▪ Unlikely to affect groundwater flow and effects can be mitigated
Environmental - Effect on Surface Water/Fisheries	▪ No anticipated impact	▪ No anticipated impact	▪ No anticipated impact	▪ No anticipated impact

6.0 Conclusion and Recommendations

- The 2014 Servicing and Settlement Master Plan (SSMP) identified a general area for the WWTP south east of Erin Village.
- The UCWS EA is a continuation of the Class EA process and aims to establish the preferred design alternative for the wastewater system servicing Erin Village and Hillsburgh.
- The updated Assimilative Capacity study completed for the UCWS Class EA study confirmed the suitability of the general WWTP site area identified in the SSMP.
- The Wastewater Collection System Alternatives Technical Memorandum confirmed that all wastewater can be conveyed to the area.
- The Outfall Alternatives Technical Memorandum confirms that Winston Churchill Boulevard is the preferred effluent discharge location from the WWTP requiring effluent to be pumped from all of the candidate sites to the outfall location.
- MOECC requirements for WWTP siting were examined and used to assist in defining potential sites.
- An assessment of site space requirements was conducted and a site area of 5 Hectares was identified sufficient for the plant facilities and a buffer zone in excess of MOECC requirements including the agricultural/Wetland areas around the site.
- Based on the above and a more detailed examination of the area, this UCWS Class EA study has refined the general area for the WWTP and selected four (4) sites within this area as being suitable for a WWTP site.
- The four (4) sites are defined as follows:
    - Site 1 Solmar site
    - Site 2A Halton Crushed Stone (HCS) site
    - Site 2B Halton Crushed Stone (HCS) site
    - Site 2C Halton Crushed Stone (HCS) site
- The project team met with the Owners of the sites and secured permission to conduct studies to support the decision making process. Studies completed by HCS were provided to the project team.
- As a result of these Owner meetings, Solmar (site 1) indicated that they would support sale of part of their land for a WWTP site and HCS (sites 2A, 2B and 2C) indicated that they would support the sale of their property only after the aggregate resources were mined and the site restored to agricultural use.
- The team compiled sufficient information on the environmental, geotechnical, archaeological and costing aspects of the sites to support an evaluation process aimed at selecting the preferred site.
- The evaluation criteria were established with the following weighting for the primary criteria:
    - Social/ Cultural Impacts – 15%
    - Technical Impacts – 10%
    - Economic Impacts– 25%
    - Environmental Impacts - 50%
- Environmental impacts are summarized as follows:

Each of the four proposed WWTP site locations contained sensitive features.

Several threatened species of birds were found on all sites. Bobolink and Eastern Meadowlark are threatened species under Ontario's Endangered Species Act. As such, certain provisions apply to development that will damage or destroy the habitat of these birds. No permit is required if the area to be developed is equal to or less than 30 hectares, but the following rules must be followed:

- The work and affected species must be registered with the MNRF before the work begins;
- A habitat management plan must be prepared and followed;
- Habitat for the affected species must be created or enhanced, and managed;
- A written undertaking must be submitted to MNRF indicating that any habitat created or enhanced will be managed over time;
- No activity likely to damage or destroy habitat, or kill, harm or harass individuals of the affected
- species will be carried out between May 1 and July 31;
- Reasonable steps will be taken to minimize adverse effects on the affected species (e.g., locating access routes outside of the birds' habitat);
- Records relating to the work and habitat must be prepared and maintained; and
- Sightings of rare species must be reported (and registration documents updated, as needed).

The WWTP site locations were evaluated based on presence of provincially and/or nationally designated SAR, sensitive bird species, and significant habitat. The screening criteria indicated that Site 1 (Solmar) is the preferred choice for the location of the WWTP site, based on the presence of two species at risk in suitable breeding habitat on the other sites (HCS). However, Site 1 does provide suitable breeding habitat for the area sensitive Savannah Sparrow, and thus qualifies as Significant Wildlife Habitat under the PPS. As such, development and site alteration are only permitted if there will be no negative impacts on the natural features or their ecological functions. Furthermore, Site 1 contained a rare and uncommon plant species (Wild Geranium), and is located next to the West Credit PSW Complex. Appropriate mitigation measures were therefore recommended to ensure no negative effects on species of conservation concern and important natural heritage features in the vicinity.

- Geotechnical impacts are summarized as follows:

  All sites are generally suitable for construction of a WWTP. Prior to aggregate extraction, the sites provide good foundation materials well above the groundwater table which will minimize the need to dewater excavations during construction. Following aggregate extraction, the HCS sites will be just above the water table which would require dewatering during excavation or otherwise importing materials and building all facilities above the water table.

- Archaeological impacts are summarized as follows:

  An archaeological investigation of Site 1 (Solmar) indicated the potential for archaeological resources to be found on site. A stage 2 investigation is recommended prior to site development.

  An archaeological investigation (Stage 1, 2 and 3) has been completed for Sites 2A, 2B and 2C (HCS). An archaeological site was located close to site 2C leaving the potential for additional resources to be located on Site 2C.

- The relative capital costs for each site are summarized as follows:

Alternative	Capital Cost Prior to Aggregate extraction	Capital Cost Following Aggregate extraction
Site 1 (Solmar)	$ 785,000	$ 785,000
Site 2A (HCS)	$ 2,665,000	$ 665,000
Site 2B (HCS)	$ 2,650,000	$ 650,000
Site 2C (HCS)	$ 2,670,000	$ 670,000

- The results of the evaluation process indicate that, **prior to aggregate extraction**, Site 1 has the highest score and is preferred over sites 2A, 2B or 2C.
- The primary reasons for this are:
    - The site owner is willing to sell the land to meet the project schedule
    - The high capital cost difference between Site 1 and Site 2A 2B and 2C which includes the resource cost for the aggregate extraction
    - The effect on the industrial sector of reducing the area for aggregate extraction
    - Aesthetics of developing a WWTP on site 2A
    - Less environmental impact on Site 1
- Based on the above, prior to aggregate extraction, it is recommended that Site 1 (Solmar) be carried forward as the preferred site for the WWTP.
- The results of the evaluation process **following aggregate extraction**, indicate that Site 2B has the highest score and is preferred over sites 1, 2A or 2C.
- The primary reasons for this are:
    - The site provides the best buffer from all nearby residences
    - The site can be hidden almost completely from view from all residences and Wellington Road 52
    - Less environmental impact following extraction assuming that HCS have mitigated the loss of habitat
- It is noted that all of the necessary studies
- It Based on the above, if aggregate extraction takes place prior to the Town requiring the site for the project then it is recommended that Site 2B (HCS) be carried forward as the preferred site for the WWTP.
- In carrying forward two treatment plant sites as possible locations for the WWTP through to the final ESR it is recognized that the municipality will need to prepare an Addendum to the ESR to make a final site selection and this addendum will need to fully explain the events that have occurred and the rationale for making the final location decision.