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via e-mail (ssone@amaranth-eastgary.ca)
CCTA File 116026

Susan M. Stone, A.M.C.T.
CAO/Clerk-Treasurer
Township of Amaranth
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**Re: Sarah Properties Ltd.
Wastewater Treatment and Effluent Disposal Class EA
Responses to Comments**

Dear Ms. Stone:

Thank you for your letter of July 14, 2017 providing detailed comments on the Waldemar Wastewater Class EA Phase 2 alternative solutions presented at the PIC on June 7, 2017. This letter presents our team's responses to your comments, questions and requests for additional information, and follows the order of your letter.

We will incorporate your comments into the final assessment and evaluation of the alternative solutions that will be documented in the Environmental Study Report (ESR) upon completion of the Wastewater Class EA study. We have previously submitted reports to substantiate the assessment of alternative solutions that was presented at the PIC. Our intent is to include these reports again in the ESR appendices. In the interim, and to better respond to your questions and comments, we have revised the preliminary table Assessment of Alternative Solutions, based on your comments.

We note that the preliminary assessment table was prepared to compare the wastewater alternatives, not the potential impacts of a new residential development, which is outside the scope of the wastewater Class EA study. However, the entries in the comparative assessment table have been revised to more clearly address the potential impacts of the wastewater facilities and the maximum number of lots.

Problem Statement

The Class EA study's Problem Statement as presented at the PIC is to identify the preferred wastewater solution for the proposed Sarah Properties Limited (SPL) development. The Class EA study's objective is therefore to find the best way to provide wastewater service for 334 lots as proposed by SPL in the

OPA application to the Township. Wastewater alternatives that cannot service the full proposed development therefore do not fully meet the project objectives.

Identify Alternative Solutions to Problem or Opportunity

There is no clear definition and distinction between a 'communal' wastewater system and a 'municipal' wastewater system. A 'communal' system can either be privately-owned ('private communal') or municipally-owned. 'Communal' refers to the servicing of multiple lots, not to the type of ownership. This is supported by the definitions in the PPS.

Throughout this application and this Class EA study, it was considered to be the Township's decision to assume or not assume a communal wastewater system, upon review of the costs and benefits to the Township. This decision does not have to be made at this stage, and does not necessitate a separate alternative solution. The MOECC will request a Municipal Responsibility Agreement (MRA) if the facility is not planned to be assumed by the Township. This will be addressed in the ESR and has been more clearly stated in the attached revised table comparing the alternative solutions.

Natural Environment Inventory

As the Township is aware, an Assimilative Capacity Study for a potential effluent discharge to the Grand River has been completed, was discussed and reviewed by the MOECC, and was forwarded to the Township. As stated at the PIC, the assimilative capacity study demonstrated that a tertiary treated effluent could be discharged to the Grand River and provincial surface water quality objectives can be met. This assimilative capacity study supports the assessment of alternative solutions.

Social Environment inventory

The ESR will provide a better description of the community of Waldemar, and will present an assessment of the potential social impacts of the wastewater facilities. We note that assessing potential impacts of a new residential development itself on the social environment is not within the scope of the wastewater Class EA study.

It is however our project team's opinion that there will not be a significant difference between the alternatives in terms of potential social impacts associated with the density of the development. The rural suburban character of the community is not expected to change significantly, when comparing alternatives with different lot yields. The number of lots is not the sole factor affecting the character of an area. Neither would the introduction of different lot sizes necessarily negatively impact the social character of the community.

As mandated by provincial planning policies, new subdivisions are being built at higher densities than older subdivisions. By today's standards, the proposed lots for the SPL plan are large lots, with the smallest frontage being 60 ft. When compared to the other subdivisions in Waldemar, the proposed SPL subdivision includes generous lots that range in size, shape, orientation and frontage. The

proposed lots are capable of accommodating detached dwellings with built form and scale consistent with the other Waldemar subdivisions. Furthermore, the inclusion of appropriate building setbacks and separation will further minimize any impacts on existing properties and respect the aesthetic and social character of Waldemar. The proposed SPL subdivision includes a public park as well as generous street widths that will result in streetscape and landscape elements that will provide the same attractive public domain as other Waldemar subdivisions, as well as provide good connectivity to the other subdivisions.

Our project team also does not believe that the type of property ownership, i.e., condominium or private, will have a significant impact on the social environment and on the integration of the new development in the existing community. Type of ownership of the wastewater system is also not considered to be a factor that affects the potential social impacts of the alternatives. A privately-owned wastewater system would provide the same opportunity to existing residents to connect as for a municipally-owned system. The difference would be in the arrangements made for the billings of operational costs.

Economic Environment Inventory

The ESR will provide a description of the range of lot sizes in Waldemar in the description of the existing environment.

We appreciate that the water utility rates are a sensitive issue to the residents of Waldemar. This will be stated in the ESR. However, this fact is not relevant to this Class EA because the implementation of new wastewater facilities would only financially affect the users of the wastewater facilities, not the existing residents, unless they desire to be connected to a new wastewater system. Full recovery of the operating costs are typically and preferably achieved through wastewater user fees rather than from municipal taxation or from water utility fees.

We agree with your statement that alternatives that create different lot yields will have different impacts. The number of developed lots has an economic impact on the Township, in terms of potential property taxation revenues; and is important to the developer as lot yield determines the financial viability of the project from a land economics and servicing viewpoint. However, as the wastewater system capital costs will be paid by the developer, and the operating, maintenance and administrative costs and infrastructure renewal costs should be fully recovered through user fees, the wastewater facilities associated with each alternative are not considered to have a potential negative economic impact on the Township.

Property values are not generally known to diminish when lots of varying sizes (smaller or larger) are located in proximity. It is our opinion that a subdivision with full servicing will maintain existing property values, or possibly increase property values in the area.

Evaluate Alternative Solutions and Identify Recommended Solutions

Background reports have previously been submitted to the Township as part of the planning application. The wastewater Class EA will be fully documented in the ESR upon completion of Phase 3, as per the

Municipal Class EA document, and will include the relevant background studies and reports that have been completed, as well as further information on the description and assessment of the wastewater alternatives, which have been revised to incorporate the comments received to date.

1. Do Nothing.

The assessment of alternatives has been revised to state that this alternative has no potential negative impacts on the natural environment. However, it is considered to have potential negative impacts on existing residents as it eliminates the opportunity to provide piped sanitary servicing to existing residents.

2. Individual Septic Tank and Tile Bed at Each Lot

- a) If the SPL lands were developed with individual septic systems at each home, the total number of lots would be restricted such that the tile beds do not impair the quality of the groundwater for downstream users. This reasonable use policy, established by the Ontario Ministry of the Environment, requires that developments serviced by individual tile beds not increase the concentration of nitrate in the groundwater above 10 mg/L, which is the drinking water standard for nitrate.

The maximum number of residential properties with individual septic systems that could be accommodated on the SPL lands is 26 lots, calculated using the following assumptions:

- Background nitrate: 3 mg/L (from Terraprobe 2014 test pit results (range of 0.1 mg/L to 3.4 mg/L));
 - Tile bed effluent nitrate: 40 mg/L;
 - Wastewater flow per tile bed: 1,080 L/day (3 ppu x 360 L/c/day);
 - Incident recharge: 125 mm/year (based on the existing silty clay soils); and
 - Total development area: 35 ha.
- b) Servicing the proposed lots by individual septic systems would be inconsistent with the 2014 Provincial Policy Statement (PPS) of the Ontario Ministry of Municipal Affairs and Housing (MMAH). As per Sections 1.6.6.2 to 1.6.6.4 of the PPS below, the PPS sets the preferred hierarchy of servicing in settlement areas as follows: municipal sewage services are the preferred form, followed by private communal sewage servicing if municipal servicing is not provided. Individual on-site sewage systems may only be used in settlement areas for infilling and minor rounding out of existing development. As per section 1.6.6.5 of the PPS, partial servicing (individual on-site sewage where municipal water is provided) is not permitted for new development.
- Section 1.6.6.2: "Municipal sewage services and municipal water services are the preferred form of servicing for settlement areas. Intensification and redevelopment within settlement areas on

existing municipal sewage services and municipal water services should be promoted, wherever feasible.”

Our comments: Municipal sewage services are not currently available in Waldemar, and as such, are not feasible for the proposed development. The proposed development seeks to expand the existing municipal water services.

- Section 1.6.6.3: “Where municipal sewage services and municipal water services are not provided, municipalities may allow the use of private communal sewage services and private communal water services”.

Our comments: Municipal sewage services are not currently available in Waldemar, and as such, a private communal sewage system, such as proposed for the development, may be allowed by the municipality and should, according to the PPS, be preferred over individual septic systems. The proposed development seeks to expand the existing municipal water services.

- Section 1.6.6.4: “Where municipal sewage services and municipal water services or private communal sewage services and private communal water services are not provided, individual on-site sewage services and individual on-site water services may be used provided that site conditions are suitable for the long-term provision of such services with no negative impacts. In settlement areas, these services may only be used for infilling and minor rounding out of existing development”.

Our comments: Waldemar is defined as a Rural Settlement Area in the PPS. There is no definition in the current PPS (2014) for “Infilling and Minor Rounding Out”. The servicing policies in the previous PPS (2005) generally restricted the use of individual on-site services to new development of five lots or less. As such, it could be interpreted that developments generally exceeding 5 lots (such as enabled by all alternatives except “Do Nothing”) are not considered as “Infilling and Minor Rounding Out”, and therefore individual on-site servicing for these developments is not permitted by PPS policy.

It is also our interpretation that the Township of Amaranth Official Plan Section 4.2.4 b) iii), which states “Where the use of communal systems is not feasible, development may be serviced by individual on-site systems where site conditions are suitable over the long term;” refers to the physical feasibility of implementing a communal system rather than the Township’s reservation about entering into a MRA or assuming the wastewater treatment facility.

The County of Dufferin Official Plan (County OP) states that Community Settlement Areas (such as Waldemar) “may continue to experience limited growth...” not “experience only limited growth” as referenced in your letter. We interpret this to mean that areas such as Waldemar have historically experienced limited growth.

The 2015 County OP forecasts a population increase for the Township of Amaranth of 747 (from 3,963 in 2011 to 4,710 in 2036), and an employment increase of 810 jobs (from 701 in 2011 to 810 in 2036).

The 2005 Township of Amaranth Official Plan states the projected population of the Township will continue to rise steadily to approximately 5,000 persons by 2024, subject to availability of services; and that residential growth shall occur at a rate of approximately 25 units per year, with 80% of new growth in the settlement areas of Waldemar and Laurel.

- c) Individual septic systems have a higher potential of failure over time as the wastewater is only treated through a septic tank before disposal into a tile bed. The other subsurface disposal alternative we considered (Alternative 4) includes a high level of pre-treatment, which would significantly mitigate the potential for biomass buildup in the disposal beds and the potential for failure. For Alternative 4, the treatment and disposal system would be monitored and controlled by certified operators and would be designed with redundancy on all equipment and processes to ensure consistent compliance with the required effluent quality.
- d) The table Assessment of Alternative Solutions is used to present a relative comparison of the alternatives. Although 10 mg/L nitrate is the maximum allowable concentration in drinking water, in our opinion, a concentration of 2.5 mg/L nitrate is better. That is why Alternative 4, which involves pre-treatment of the wastewater to remove nitrogen and other contaminants, would have a lesser potential negative impact on groundwater quality than Alternative 2, which has only a septic tank as pre-treatment.
- e) Although all options would be designed to meet the Ontario Building Code and/or the 2008 MOE Design Guidelines, individual septic systems, which are not monitored or operated by qualified staff, have a higher potential to not perform as intended and to reach the end of their life earlier. The potential for contamination of wells downstream of individual septic systems, once these are reaching the end of their useful life, is greater than for any of the other alternatives considered. For all other alternatives, the wastewater is treated before disposal, the treatment facility is designed with redundancy and is operated and monitored by qualified operators, and the performance of the facility is closely monitored to ascertain it meets the conditions of its MOECC approval.
- f) The existing water supply in Waldemar is a regional groundwater aquifer that has sufficient capacity for the existing and future residents. There is no risk that water taking to supply water to an additional 334 lots will mine the aquifer. The 'Drinking Water Supplies' criteria in the assessment table compares the wastewater alternatives in terms of the potential impacts on the quality of the water used for drinking. Comments regarding both water quantity and quality have now been added.

3. Communal WWTP with Effluent Discharge to the Grand River

- a) The suggested outfall location is at the existing storm drainage outfall. It is our understanding that it is the only public land available for this purpose. If alternatives are available, they will be considered in Phase 3 of the Class EA. We note that the effluent from the tertiary wastewater treatment plant would be clear, odourless and disinfected. Therefore, it has very low potential negative impacts. Concerns that were expressed from the public appear to be because there is a

misunderstanding of the difference between raw sewage and treated effluent, particularly from a tertiary treatment facility.

- b) The bullet "No environmental constraints" in our presentation was intended to summarize in one line that there are no significant environmental features (vegetation, wildlife habitat) at the location of the proposed sewage treatment plant on the development site that would be considered constraints.
- c) Preliminary construction cost estimates were prepared for the purpose of comparing the alternative solutions. These preliminary cost estimates are attached.
- d) The bedrock aquifer from which the municipal water supply is drawn is deep and located below a thick confining layer that provides significant protection from surface water. The municipal wells are considered non-GUDI (not under the direct influence of surface water). Further, as confirmed by the Grand River Watershed Source Water Protection Assessment Report, the groundwater east of the Grand River has the lowest vulnerability rating. There is no risk to the municipal water supply aquifer from domestic uses in Waldemar, nor from the disposal of effluent.
- e) The bullet "Aesthetic impacts can be mitigated" in our presentation was intended to briefly convey that although an STP and pumping station would be visible and could occasionally have odours, the proposed facilities would be designed to be aesthetically pleasing and be compatible with the residential buildings, and the WWTP would be equipped with an air scrubber to eliminate the potential for odours. The potential for significant negative aesthetic impacts would be very low. The ESR and the assessment table will provide more descriptive statements.
- f) Under the evaluation criteria "Approval Requirements", we intended to convey the level of effort that would be needed before approvals were obtained. We have revised the assessment to be the same for Alternatives 3, 4 and 5 in that they will all require an ECA to be issued to the Township.
- g) The alternative solution of constructing a new STP with surface discharge can offer the opportunity to replace septic systems because the STP can be expanded to accept additional sewage. All other alternative solutions have capacity limitations. Therefore, Alternative 3 was the best for that criterion. If the Township wanted to extend sanitary sewers into existing areas and the Township did not assume the STP to which the sewers discharge, arrangements could be made with the private or condominium corporation for billing of the operating costs. As such, our rating score is considered appropriate.
- h) We are unclear on how entering into a Municipal Responsibility Agreement (MRA) for communal wastewater facilities would have a financial and social impact on the Township or Waldemar. If the Township does not assume the communal wastewater facilities, the MOECC will require a MRA between the Township and the developer that would stipulate the conditions under which the communal services would be constructed, operated and maintained and the actions by the Township in the event of default by the developer. The MRA would include financial assurance provisions that

will ensure a security satisfactory to the Township is available for capital improvements if the Township has to assume the STP. Therefore, a MRA would set provisions that are satisfactory to the Township for capital costs. Ongoing operating and maintenance costs after assumption would be recovered through adequately established user fees, therefore would not have financial impacts on the Township.

4. WWTP with Discharge to Leaching Beds

- a) The calculation of the maximum number of lots that can be developed on the site if a large subsurface disposal system is used, was based on the MOE 2008 Design Guidelines for Sewage Works (Chapter 22), which states the groundwater nitrate concentration at the downstream property line cannot be more than 2.5 mg/L assuming the background nitrate is 0 mg/L.

To service 334 residential units, the WWTP would need to achieve an effluent nitrate level of about 3 mg/L in order to ensure the nitrate concentration in the groundwater at the east property line would not exceed 2.5 mg/L. This effluent quality is beyond the capability of available treatment technology. Therefore, this alternative is not technically feasible for 334 lots. Using a technically feasible STP effluent limit of 7 mg/L nitrate, a maximum of 50 units could be serviced by a STP and communal subsurface disposal bed on the property.

- b) Preliminary cost estimates for all options are attached and will be included in the ESR.
- c) A tree inventory was conducted in May 2014 and found 39 individual trees and 10 tree groupings on the SPL property, most of which are located at the edges of the property. As Alternative 4 involved the most disturbed area for wastewater facilities, including a large effluent disposal bed at the western site boundary, the impact on vegetation was considered to be the greatest for this alternative. When the site is graded and prepared for home construction, any internal trees may be removed, even if home density is less than currently proposed. Trees on the boundary of the site are more likely to be retained, with the exception of Alternative 4.
- d) Operation and maintenance requirements were assessed on a relative basis rather than estimating the annual costs because they will depend on the selected treatment and pumping equipment, which will be completed in Phase 3. Our assessment is that the operating and maintenance effort and costs associated with a communal WWTP (Alternatives 3 and 4) would be higher than for a connection to the Grand Valley WPCP (Alternative 5).

5. Connection to Grand Valley WPCP

- a) The timing of the Grand Valley WPCP expansion is unknown. Although the municipality may be initiating a Class EA at this time, it is unknown when the facility would be constructed and capacity made available. The design and construction of an expansion to an existing sewage treatment plant are much more complex and lengthy than for a small new facility on a greenfield.

- b) The alignment of the forcemain and lift stations presented on the figures is preliminary. If this alternative is preferred, locations of the facilities will be refined in Phase 3 of the Class EA and then confirmed during final design.
- c) The project cost estimates of the alternative solutions only considered the costs to the developer, therefore there is no option with two plants. In Alternatives 3 and 4, the costs are for one STP in Waldemar. For Alternative 5, the costs are for two sewage pumping stations and the forcemain to convey the sewage to the Grand River WPCP, plus a proportional share of the estimated cost to build the Grand River WPCP expansion. Although there may be savings in the operating costs at the Grand River WPCP, as they would be shared by more users, Waldemar users would have to pay for the additional O&M costs for pumping the wastewater to the Grand River WPCP. This is quite different than the analysis that the Town of Erin must do as they consider servicing two communities within their own municipality.
- d) Alternative 5 has a significant estimated capital cost that makes it the least financially viable. Further, it has a timeline that is unknown but fully expected to be longer than if a Waldemar wastewater facility was implemented. For these reasons, it was not pursued extensively.
- e) The assessment of the potential odour issues in the forcemain was revised as it is correct that the formation of odour can be mitigated.

We trust the above responses and the attached documents provide the additional information you required to complete the review of the SPL application.

Yours truly,
C.C. Tatham & Associates Ltd.



Suzanne Troxler, B.Eng., M.Sc., P. Eng.
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ST:rlh

Encl.: Revised Table Assessment of Alternative Solutions
Preliminary Cost Estimates of Alternative Solutions

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Table 3: Assessment of Alternative Solutions - Revised

Worst	Poor/Minor Negative	No Potential Impact	Good/Positive	Best
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Evaluation Criteria	Description	1	2	3	4	5
		Do Nothing	Individual Septic Systems	Communal WWTP with Surface Discharge	Communal WWTP with Subsurface Discharge	Connection to Expanded Grand Valley WPCP
Meets Objectives	Capacity to Service Proposed Development	Does not meet project objectives. Lands cannot be developed without wastewater disposal solution. No homes can be built.	Does not meet project objectives, nor conform to the intent of OP and PPS. Only approx. 26 lots can be developed to limit nitrate impact on groundwater.	Can meet project objectives. 334 lots could be developed. Grand River has adequate assimilative capacity.	Limited potential to meet project objectives. Only approx. 50 lots can be developed to limit nitrate impact on groundwater.	Can't meet project objectives now as excess capacity is not currently available. Only feasible if Grand Valley expands WPCP in future.
	Impact on Timing of Development	Development is delayed indefinitely.	Lots could be developed immediately.	Lots could be developed immediately.	Lots could be developed immediately.	Development delayed until expansion of Grand Valley WPCP (not planned yet).
Environmental and Heritage Impacts	Groundwater Quality	No potential impact on groundwater quality.	Potential for shallow groundwater nitrate levels to reach 10 mg/L at east property line.	No potential impact on groundwater quality.	Potential for shallow groundwater nitrate levels to reach 2.5 mg/L at east property line.	No potential impact on groundwater quality.
	Surface Water Quality	No potential impact on surface water quality.	Low potential impact on water quality of the Grand River. Tile beds would not be adjacent to any surface water.	Tertiary wastewater treatment required to maintain PWQO in Grand River.	Low potential impact on water quality of the Grand River. Leaching beds would not be adjacent to any surface water.	Tertiary wastewater treatment required to maintain PWQO in Grand River.
	Vegetation	No potential impact on existing vegetation.	Removal of some existing vegetation for individual tile beds.	Removal of some existing vegetation for WWTP. WWTP would be located in un-treed area.	Removal of some trees for WWTP and leaching beds.	Removal of some existing vegetation for sewage lift stations.
	Wildlife and Wildlife Habitat	No potential impact on wildlife and wildlife habitat.	No significant wildlife or wildlife habitat have been identified on SPL site.	No significant wildlife or wildlife habitat have been identified on SPL site.	No significant wildlife or wildlife habitat have been identified on SPL site.	No significant wildlife or wildlife habitat have been identified on SPL site.
	Archaeological or Heritage Resources	No potential archaeological or heritage impacts.	No significant archaeological or heritage features have been identified on SPL site.	No significant archaeological or heritage features have been identified on SPL site.	No significant archaeological or heritage features have been identified on SPL site.	No significant archaeological or heritage features have been identified on SPL site.
Socio-Economic Impacts	Drinking Water Supplies - Quality and Quantity	No potential impact on existing drinking water supplies.	Potential to increase nitrate and bacteria levels in shallow wells used for drinking water. No potential impact on capacity of existing drinking water supplies.	No potential impact on water quality or quantity of existing private and municipal drinking water supplies.	Low potential to increase nitrate and bacteria levels in shallow wells used for drinking water, due to high treatment level and location of leaching beds far from existing wells. No potential impact on capacity of existing drinking water supplies.	No potential impact on water quality or quantity of existing private and municipal drinking water supplies.
	Existing Residential	No opportunity to replace aging septic systems.	No opportunity to replace aging septic systems.	Opportunity to replace aging septic systems and connect to new communal system if municipal sewers are installed.	No opportunity to replace aging septic systems.	Opportunity to replace aging septic systems and connect to new communal system if municipal sewers are installed and WPCP capacity is available.
	Temporary during Construction	No potential temporary construction impacts.	No potential temporary construction impacts.	Minor impacts in Waldemar during construction of on-site WWTP and lift station, and effluent pipe.	Minor impacts in Waldemar during construction of on-site WWTP, lift station and leaching beds.	More impacts in Waldemar during construction of lift stations and forcemain. Disruption of Upper Grand Trailway for forcemain construction.

Evaluation Criteria	Description	1	2	3	4	5
		Do Nothing	Individual Septic Systems	Communal WWTP with Surface Discharge	Communal WWTP with Subsurface Discharge	Connection to Expanded Grand Valley WPCP
	Aesthetics: Noise, Visual, Odour	No potential noise, visual or odour impacts.	No potential noise or visual impacts. No odours expected when systems function properly.	Typically low and intermittent noise from WWTP and lift station. Minor visual impact of WWTP and lift station buildings. Minor potential for odours at lift station and at WWTP if treatment process is disrupted. Can be mitigated.	Typically low and intermittent noise from WWTP and lift station. Minor visual impact of new WWTP and lift station buildings. Minor potential for odours at lift station and at WWTP if treatment process is disrupted. Can be mitigated.	Typically low and intermittent noise from lift stations. Minor visual impact and potential for odours at new lift stations. Potential for odours at Grand Valley WPCP in early phases of development due to long residence time in forcemain. Can be mitigated.
Technical Considerations	Technical Feasibility / Ease of Implementation	No implementation required.	No technical constraints.	More complex to implement due to infrastructure required (sewers, lift station, WWTP and outfall).	More complex to implement due to infrastructure required (sewers, lift station, WWTP, leaching beds).	Most difficult to implement due to need for coordination with Grand Valley and infrastructure required (sewers, lift stations, forcemain and expansion of WPCP).
	Flexibility / Ease of Expansion	No ability to expand.	Does not provide any future benefit for servicing existing homes or other new development.	WWTP could be designed with ability for future expansion for existing homes or other new development.	Does not provide any future benefit for servicing existing homes or other new development.	Potential for expansion to increase serviced area if Grand River WPCP capacity is available.
	Operations and Maintenance Requirements	No operation and maintenance requirements.	Septic tank pump-out every 3-5 years. No O&M responsibilities for the Township.	Ongoing O & M for the WWTP and lift station.	Ongoing O & M for the WWTP, leaching beds and lift station.	Ongoing O&M for the sewage pumping stations.
	Approval Requirements	No approvals required.	Homeowners responsible for obtaining approvals under OBC.	MOECC Environmental Compliance Approval required for wastewater works.	MOECC Environmental Compliance Approval required for wastewater works.	MOECC Environmental Compliance Approval required for lift stations and forcemains.
	Agreements	No requirement for any agreements.	No requirement for any agreements.	A Municipal Responsibility Agreement may be required by MOECC if the Township does not assume the wastewater treatment facility. No requirement for inter-municipal agreement.	A Municipal Responsibility Agreement may be required by MOECC if the Township does not assume the wastewater treatment facility. No requirement for inter-municipal agreement.	An inter-municipal agreement needs to be developed with the Town of Grand Valley.
	Financial Impacts	Estimated Project Costs per Lot	No project costs.	Estimated cost per new lot: \$26,000.	Estimated project cost: \$3.4 M. Estimated costs per new lot: \$10,000.	Estimated project cost: \$3.9 M. Estimated cost per new lot: \$77,000.
	Land Required for New Infrastructure	No land requirements.	Each lot must be larger to accommodate a tile bed.	Land required for lift station and WWTP (small footprint), within the SPL site.	More land required for lift station, WWTP (small footprint), and leaching beds, within the SPL site.	Land required for lift stations only.

**Waldemar Wastewater Class EA
Phase 2 Alternative Solutions Cost Estimates**

**Alternative #2:
Individual Septic Systems**

	Quantity	Unit	Unit Cost	Cost Estimate
Individual on-site septic system	26	lots	\$20,000	\$520,000
	Subtotal			\$520,000
	Engineering (Design and Construction)		10%	\$52,000
	Contingency		20%	\$104,000
	TOTAL			\$676,000
	Per Unit Cost	26 units		\$26,000

Waldemar Wastewater Class EA
Phase 2 Alternative Solutions Cost Estimates

Alternative #3
Communal WWTP with Surface Discharge

	Quantity	Unit	Unit Cost	Cost Estimate
Sewage Lift Station (approx. 6 L/s)	L.S.			\$250,000
75 mm forcemain	325	m	\$200	\$65,000
New Sewage Treatment Plant	L.S.			\$2,000,000
Effluent Outfall	L.S.			\$200,000
	Subtotal			\$2,515,000
	Engineering (Design and Construction)		15%	\$377,000
	Contingency		20%	\$503,000
	TOTAL			\$3,395,000
	Per Unit Cost	334 units		\$10,200

exclusive of sanitary sewers and storm sewer reconstruction

Waldemar Wastewater Class EA
Phase 2 Alternative Solutions Cost Estimates

Alternative #4:
Communal WWTP with Subsurface Discharge

	Quantity	Unit	Unit Cost	Cost Estimate
Sewage Lift Station (approx. 6 L/s)	L.S.			\$250,000
75 mm forcemain	325	m	\$200	\$65,000
Main Sewage Pumping Station (approx. 30 L/s)	L.S.			\$1,500,000
200 mm forcemain	580	m	\$340	\$197,000
New Sewage Treatment Plant and Leaching Beds	70,000	L	\$12	\$840,000
	Subtotal			\$2,852,000
	Engineering (Design and Construction)		15%	\$428,000
	Contingency		20%	\$570,000
	TOTAL			\$3,850,000
	Per Unit Cost	50 units		\$77,000

exclusive of sanitary sewers

**Waldemar Wastewater Class EA
Phase 2 Alternative Solutions Cost Estimates**

**Alternative #5:
Connection to Grand Valley WPCP**

	Quantity	Unit	Unit Cost	Cost Estimate
Sewage Lift Station (approx. 6 L/s)	L.S.			\$250,000
75 mm forcemain	325	m	\$200	\$65,000
Sewage Pumping Station (approx. 30 L/s)	L.S.			\$1,500,000
200 mm forcemain	3,400	m	\$340	\$1,156,000
Grand Valley WPCP Expansion	541	m ³	\$3,500	\$1,900,000
	Subtotal			\$4,871,000
	Engineering (Design and Construction)		15%	\$731,000
	Contingency		20%	\$974,000
	TOTAL			\$6,576,000
	Per Unit Cost	334 units		\$19,700

exclusive of sanitary sewers