COALITION FOR THE WEST CREDIT RIVER

INGROUND INFILTRATION OF WASTEWATER

The Coalition for the West Credit River (Coalition) is presenting a viable option to the current design of simply directing discharge of sewage effluent from the proposed Erin Wastewater Treatment Plant (Project) into the coldwater ecosystem of the West Credit River.

In consideration of the ecosystem benefits of a healthy West Credit River and its sensitive Brook Trout and Redside Dace population, we are recommending that inground infiltration of the final wastewater effluent be seriously considered, as a viable alternative to discharging warm sewage effluent directly into the West Credit River. Discharge of treated effluent by way of passive infiltration into the ground with slow percolation into this relatively small stream is the best way to ensure that the final effluent reaches the stream as natural and cold groundwater.

Background Information:

One of the chief concerns is that the Town of Erin and their consultants, Ainley Group and WSP, along with the Ministry of Environment, Conservation and Parks (MECP) and the Credit Valley Conservation (CVC), proposed no innovative or effective measures to keep the sewage effluent cool. In the case of this particular Project, it is crucial that innovative measures are established to protect these sensitive native Brook Trout and Reside Dace populations and their coldwater West Credit River habitat. Check out this amazing jewel of a Brook Trout population here.

We remain very concerned that the ESR clearly spelled out the danger of discharging 7,120,000 liters per day of warm effluent to the West Credit River, yet the earlier recommendation of an effluent temperature limit of 19°C did not appear in the final version of the ESR. This specific recommendation was deleted from the final ESR without explanation.

Inground Infiltration:

One highly viable option to keep the effluent cool, as well as providing extra treatment of the effluent, is to discharge this highly treated effluent into the ground on the treatment plant site through a large underground perforated pipe system. The slow percolation of the infiltrated effluent through the large gravel deposit in this area is ideal to provide additional treatment, as well as cool and dilute the effluent as it slowly infiltrates down through the natural sand and gravel filter. It then flows with the local groundwater to mix with the coldwater springs feeding the West Credit River.

Effluent infiltration systems have been used successfully elsewhere in Ontario where it was important to protect sensitive receiving streams. For instance, the former Village of Markdale uses infiltration of effluent to protect the Rocky Saugeen River, which is also a coldwater Brook Trout habitat. Infiltration of effluent also occurs in Lucknow, located at the headwaters of the

Nine Mile River. Both infiltration systems are smaller than what is being proposed for the Erin Wastewater Treatment Plant but have similar gravel geology, and function very well. We understand that these infiltration systems have been working well for several years and the wastewater treatment facilities have apparently had no measurable impact on local Brook Trout streams.

We provide three marked up drawings from the Project's Environmental Study Report (ESR) for Site 1 (Solmar land), the site chosen for the proposed Project:

- Figure 1 – Ainley drawing showing the general layout of the treatment plant on a 5 Ha parcel on the overall 39 Ha Solmar Site.

- Figure 2 – Overall drawing of the 39 Ha Solmar site on the northeast side of County Road 52, which also shows the 5 Ha Project site parcel.

- Figure 3 showing the overall area around the 39 Ha Project site including lands on the south side of County Road 52.

In all figures we show the schematic locations of a 200 m by 100 m infiltration zone (2 Ha) that could be used to discharge the treated effluent into the groundwater.

The Option 1 location is immediately northeast of County Rd 52 on the 5 Ha Project site parcel. Option 1 takes advantage of the 200 m long by 100 m wide area that appears to be reserved as setback lands from County Rd 52 and provides no other function at the site. This land is therefore available for a large 2 Ha infiltration bed.

Option 2 is a similar sized infiltration bed located just west of the 5 Ha Project site that would also be suitable for inground disposal of the effluent.

This Project, and the Project site, appear to be ideally suited for inground disposal of effluent for the following reasons:

i) The travel time underground of the infiltrated effluent, especially when mixing underground with groundwater flowing toward the West Credit River, will provide the best guarantee that the effluent will be cooled to normal background groundwater temperatures (i.e., 9°C) by the time it emerges from the ground and first enters the small tributary to the West Credit on the north side of the Solmar property.

ii) The treated effluent should be ultra-clear water with no solids – due to the membrane treatment provided in the sewage treatment plant. There is therefore virtually no risk of clogging of the infiltration bed or the sands and gravel below with solids over time.

iii) The treated effluent will have very low nitrate levels as de-nitrification of the sewage plant effluent is proposed. We understand nitrate levels less than 10 mg/l must be maintained in groundwater and the proposed treatment effluent limits indicate nitrate levels in the effluent will be no higher than 5 mg/l.

iv) The treated effluent, in addition to receiving membrane filtration, will feature UV disinfection – guaranteeing virtually no measurable bacteria or viruses in the effluent.

v) The geotechnical report for the project identifies the soils below the treatment plant site as being largely sand and gravel. This geology would allow the infiltrated effluent to generally flow straight down until it reaches the groundwater table.

vi) Inground disposal of effluent would also provide additional treatment and removal of ammonia and phosphorus in the effluent.

We offer the following analysis of feasibility to infiltrate the effluent on site:

i) As above, the geotechnical report for the treatment plant site indicates the underlying soils are sands and gravels.

ii) We understand the "T time" for sands and gravels would likely be in the range of 6 min to 12 min per cm. For this analysis, let's assume the T time is 10 min per cm.

iii) This means that it takes 10 minutes for a cm depth of water to infiltrate into the ground. This means that 6 cm of water could infiltrate into the ground per hour (60 minutes per hour divided by 10 minutes per cm = 6 cm per hour).

iv) This means that theoretically, 144 cm (or 1,440 mm) of water could be infiltrated per day (24 hours x 6 cm per hour).

v) However, there would likely be other cautionary measures to consider as the effluent is infiltrated into the ground, but we think it reasonable to assume that 20 cm (or only 14% of the above) could be infiltrated per day. This is equal to only 8.3 mm per hour.

vi) To determine necessary infiltration bed area, divide 7,120 cmd by 0.2 m/d. Equal to a land area of 35,600 square meters or just under 4 Ha.

vii) Alternatively, ground water modelling could show that 40 cm per day could be infiltrated, reducing the infiltration area to 17,800 square meters (1.78 Ha). While 40 cm per day is significant, it is still only 28% of the daily infiltration rate of 144 cm per day based on a T time of 10 min per cm.

While 4 Ha exceeds the 2 Ha parcels shown in Figures 1, 2 and 3, it simply means that both infiltration areas should be used, or that the effective area for infiltration will spread out to say the 4 Ha below each 2 Ha area. Or the higher application rate of 40 cm per day (point vii) could be justified.

Either way, the very sensitive nature of the receiving stream, the location of the treatment plant site adjacent to the river, the very high quality of effluent proposed (via membrane treatment and denitrification) and the gravel and sandy soils beneath the plant, all point to this particular project being a potential, ideal candidate for a large effluent infiltration system.

ESR Review of Subsurface Discharge:

We appreciate that the ESR did include an evaluation of effluent infiltration as an alternative to direct discharge of the Project effluent to the West Credit River. The particular report (Town

of Erin Wastewater Class EA – Subsurface Disposal Alternative – May 2017)[1] has been reviewed as part of this submission and we provide the following comments.

In particular, Table 7 of this document summarizes the infiltration land area required for different flow scenarios. However, we take a number of exceptions to this table, and the general analysis completed, as summarized below:

i) The authors use the formula L = QT/300 to first determine the tile length or trench length required. This formula results in extreme lengths of tile which then translates to extremely large land areas required for infiltration.

   For instance, at the top of Table 7, the tile or trench length calculated for a flow of 4,750 cmd per day (average effluent flow) from just Erin (excluding effluent flows from Hillsburgh) is calculated to be 95,000 m assuming a T time of 6 and is similarly calculated to be 190,000 m assuming a T time of 12.

   These extremely long tile lengths are then used to determine the required, surrounding area of land required to accept the effluent from the tiles for infiltration.

   For a tile length of 95,000 m, the required area is 385,670 square meters. For a tile length of 190,000 m, the required area is 771,350 square meters. These land areas are based on a T time of 6 and a T time of 12, respectively.

ii) These land areas appear to be far, far larger than required. For example, the first land area example above assumes 385,670 square meters of land area is required for a tile length of 95,000 m, a T time of 6 min/cm and for the flow of 4,750 cmd.

   If one calculates the daily hydraulic loading of the effluent volume over the land area (4,750 cmd divided by 385,670 square meters), the resulting loading is only 12.3 mm per day – or approximately half of one mm per hour! This compares to the T time of 6 minutes per cm, which is equal to a much higher infiltration rate of 10 cm (100 mm) per hour.

iii) The cost of infiltration is therefore presented in the May 2017 report as being incredibly expensive essentially because the calculations presented conclude massive land areas are required.

iv) The calculations have at their root the initial calculation of tile length (L= QT/300). We do not dispute the relevance of this calculation when applied to relatively poor quality septic tank effluents that will have high BOD values and high nutrient values – all of which promote biofilms and bacterial slimes around typical septic tank tiles.

v) However, in the case of the current proposed Project effluent quality, BOD and nutrients will be very low. Solids, as noted, will be very low due to membranes used in the Project. We feel it would be more appropriate to look at the effluent infiltration opportunity as simply the physical ability to absorb clean water (such as rainwater) falling on the same soils.

vi) As per the previous section, we feel that a 2 Ha or 4 Ha infiltration bed, using application rates of only 8 to 16 mm per hour, could be reasonably considered for the Project.

[1] *ESR, Volume 2, Appendix B to J, Part 2, Town of Erin Wastewater Class EA Subsurface Disposal Alternative, May 2017, Ainley Group, File No. 115157.*

The highly treated effluent will become part of the groundwater inflow to the West Credit and in doing so becomes an environmental asset compared to an environmental liability when the effluent is simply discharged into the river in a warm state and with very little dilution.

The Mayor of Erin is on record as saying the plant effluent will be good enough to drink. The engineer (WSP) says the effluent will be of the very highest quality…and perhaps one of the best in North America.

As such, all parties continue to guarantee that the effluent is so good there is absolutely no problem with discharging large volumes of the effluent directly to the very small and sensitive West Credit River. If the effluent is good enough to drink, and of the very best quality (other than the fact that the effluent will be warm) then surely it is an ideal candidate to infiltrate into the local groundwater directly on the Project site so it can slowly filter through the ground into the West Credit River tributary.

We note the lands across the road from County Road 52 are also gravel pit lands and a similar infiltration system could be located there. Overall, many of the adjacent lands near Erin feature existing and/or proposed gravel pits - attesting to the overall favourable geology available on site for inground (infiltrated) disposal of effluent.

Conclusion:

The Coalition submits that the only way to escape damaging thermal impacts of the effluent on the small and sensitive West Credit River is to infiltrate all effluent into the ground.

We appreciate that the design of the sewage plant is underway – but the extremely high value of the sensitive West Credit River suggests that a proper solution to this environmental challenge requires a carefully considered and well thought out solution – not a rushed solution done simply to expedite the growth of Erin and favour the wealthy collective of 10 eager land developers.

Afterall, this quote from a Ministry of Environment staff representative during a 2013 LPAT hearing says it all:

> "*By way of necessary background, the Town of Erin has approached the MOE several times in the past to discuss the potential of a municipal sewage treatment plant that would discharge to the West Credit River. Proposals have not been supported by MOE, due in large part to consideration of the need to protect the high-quality aquatic ecosystem in this branch of the Credit River. This branch of the Credit River provides cold water habitat to one of the few remaining self-sustaining wild brook trout populations in southern Ontario. The Credit River above Inglewood up to the bottom of the Niagara Escarpment World Biosphere Reserve is home to a thriving population of resident brown trout. Rainbow Trout and Atlantic Salmon are also at the Forks Provincial Park. Water quality in this branch of the Credit River is exceptional."*[2]

Therefore, a careful assessment of the feasibility of infiltrating the effluent is in order.

[2] *LPAT, Wellington County Hearing Documents, 22 February 2013 letter from Dwayne Evans, Municipal Services Office-Western, Ministry of Municipal Affairs & Housing to Mark Van Patter, County of Wellington Planning and Development. P-174/653.*

We realize the size of the infiltration system is quite large at 7,120 cubic meters per day and is perhaps unprecedented in Ontario; however, so many elements of this Class EA are also unprecedented, being that:

i) Erin and the MECP all believe they can discharge very large volumes of warm effluent to one of very best remaining coldwater brook trout habitats in Southern Ontario - without damaging this very sensitive ecosystem.

ii) The province approved a public Class EA process that featured closed door, back-room decision making to eliminate effluent temperature limits in the final ESR and Environmental Compliance Approval, and all without explanation to the public.

iii) This ESR failed to take into account climate change impacts over time on both the temperature of the treatment plant effluent and on the background temperatures of the West Credit River – even though Class EA standard procedures in 2019 and before required the proponent to consider climate change impacts on the project.

iv) That Erin features a municipal Council and Mayor with very close ties to land developers that raises serious questions the about arm's length independence of elected politicians in this case.

v) The ESR inexplicably didn't adequately consider the cumulative effects of the Project, i.e., never considered the impact of much greater groundwater pumping to service a population of over 18,000 persons on local groundwater resources. Such increased groundwater pumping for potable water requirements would logically come at the expense of baseflow (summertime low flow) in the West Credit River. If summer stream flows decline due to greatly increased groundwater pumping, and a warming climate, the negative impact of the large volumes of warm effluent on the small West Credit River will be greatly increased.

vi) The ESR approved by Minister Yurek committed to completing the following:

1. An Addendum to the ESR: "*In carrying forward two recommended alternatives for the WWTP site through to the final ESR, it is recognized that the municipality will need to prepare an Addendum to this ESR to make a final site selection. The addendum will need to provide details of the events that have occurred and the rationale for making the final location decision*[3]. A Notice of Addendum, should have also featured public input and review; however, to our knowledge no Addendum was ever filed.
2. An Environmental Management Plan: "*An arborist report of all affected areas will be prepared as part of an overall Environmental Management Plan for the project during the design stage,"*[4]
3. An Arborist Report for all affected areas (see above).
4. An additional Bird Survey: "*Once the exact location is known we propose conducting additional bird surveys in the affected habitat to document whether any species at risk and sensitive species are present (such as Eastern Meadowlark, Bobolink, Savannah Sparrow) and formulate potential mitigation plans should they be required*"[5]. The owner of the Solmar land has already removed and burned a large tract of brush and trees from the land surrounding Project site.

[3] *ESR, Volume 1 of 3, 13.4.3 Results of the Wastewater Treatment Plant Site Alternative Evaluation. P-139/526.*
[4] *ESR, Volume 2 of 3, Part 2, Hutchinson 11 April 2018 Response to Tara McKenna, Species at Risk, Comment #11. P-234/341.*
[5] *ESR, Volume 2 of 3, Part 2, Hutchinson 11 April 2018 Response to Tara McKenna, Species at Risk, Comment #14. P-234/341.*

Instead of fulfilling its ESR commitments, the Mayor completed his now famous $2 land deal with a private developer for the 5 Ha parcel of Solmar land for the Project site.

As such, the Coalition's position is that since no Notice of Addendum was ever filed that the Town of Erin is now out of compliance with its commitments made in the ESR.

We respectfully recommend that Inground Infiltration of all sewage effluent be seriously explored as an alternative that would protect the sensitive West Credit River habitat and its resident Brook Trout and Redside Dace.

For more information you can contact the Coalition at info@CWCR.ca.

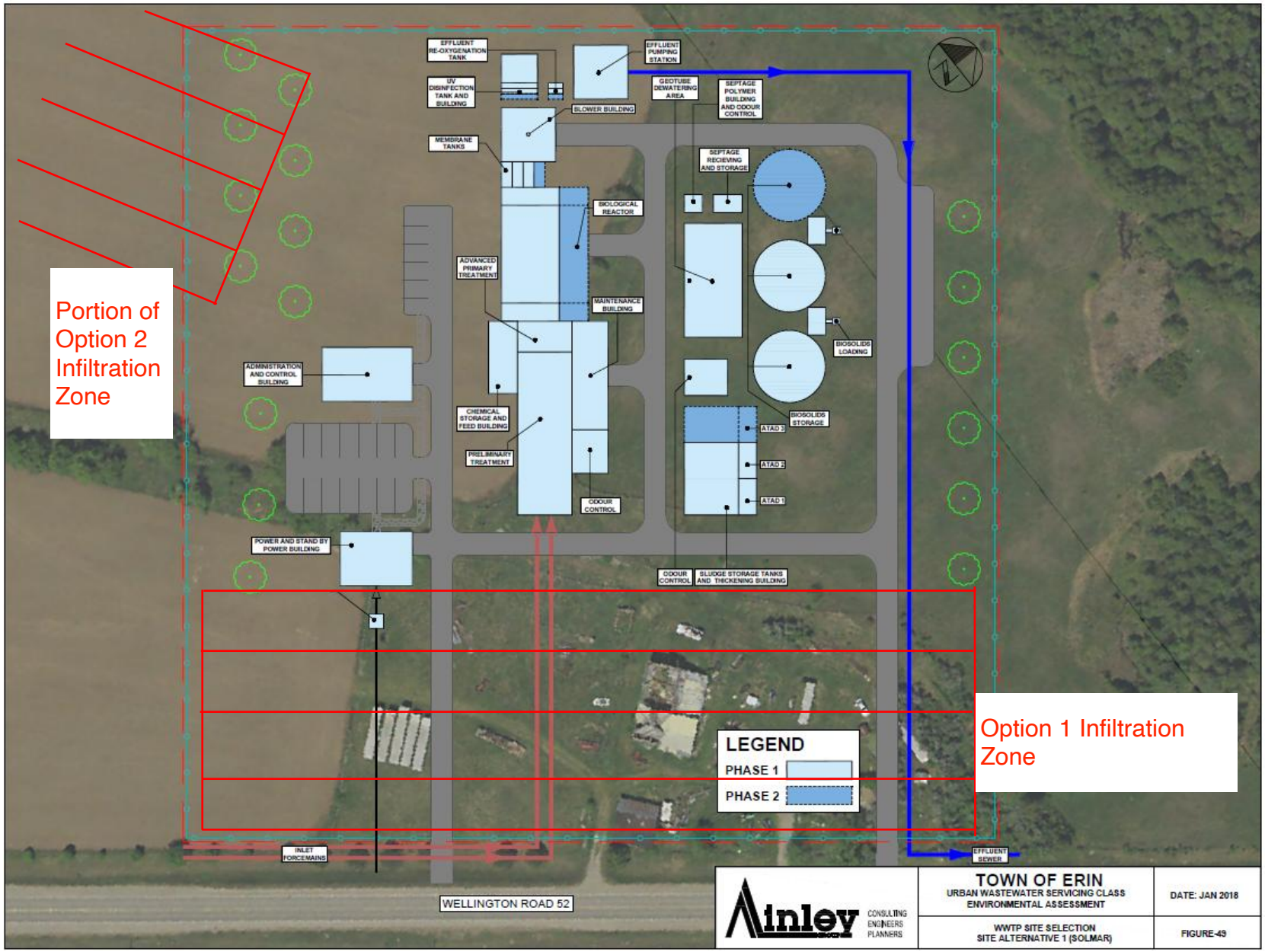

Figure 1 - Approximately 200 m x 100 m Infiltration Zone (option 1 and option 2)

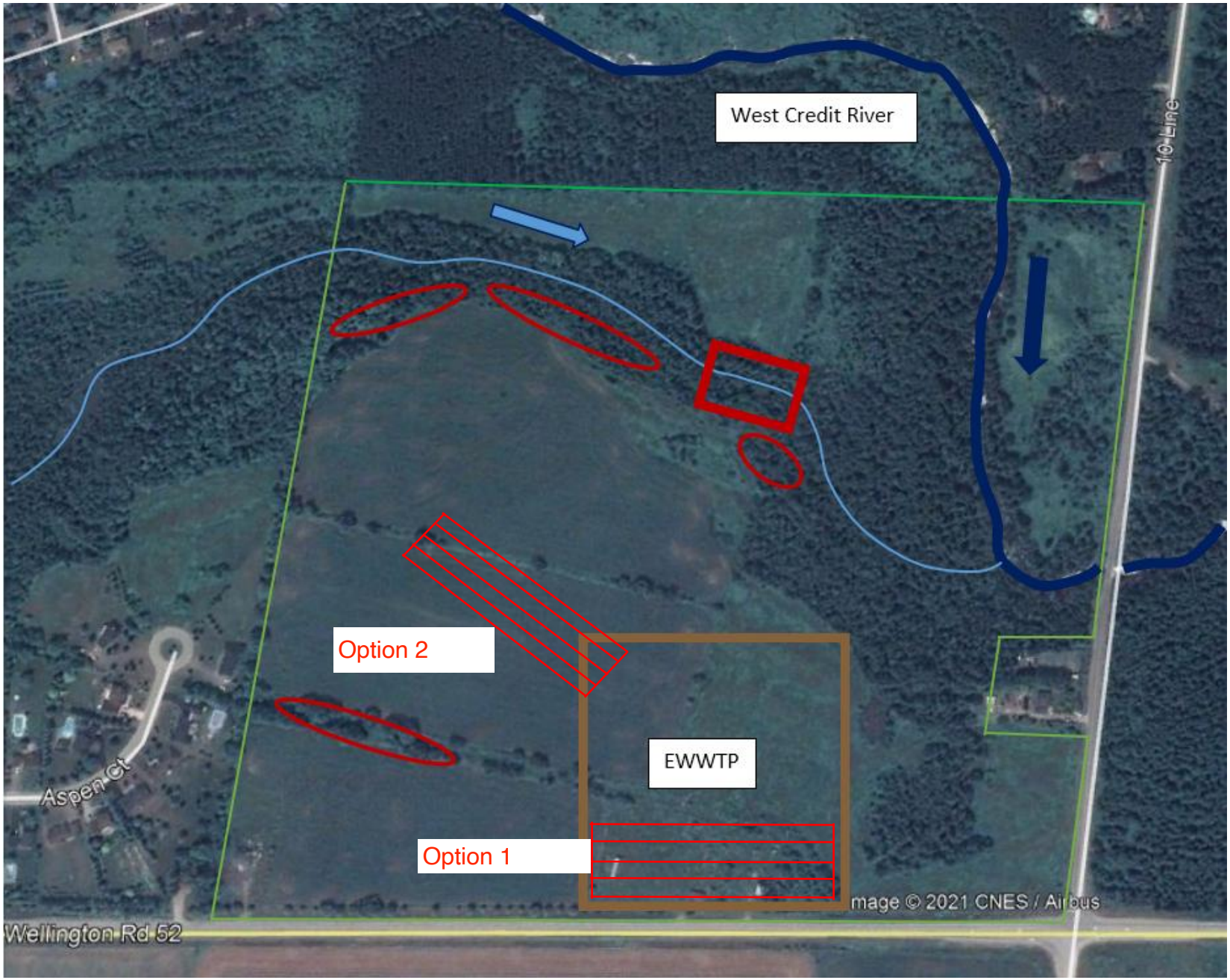

Figure 2 - Option 1 and Option 2
Infiltration zones on or adjacent to Erin WWTP

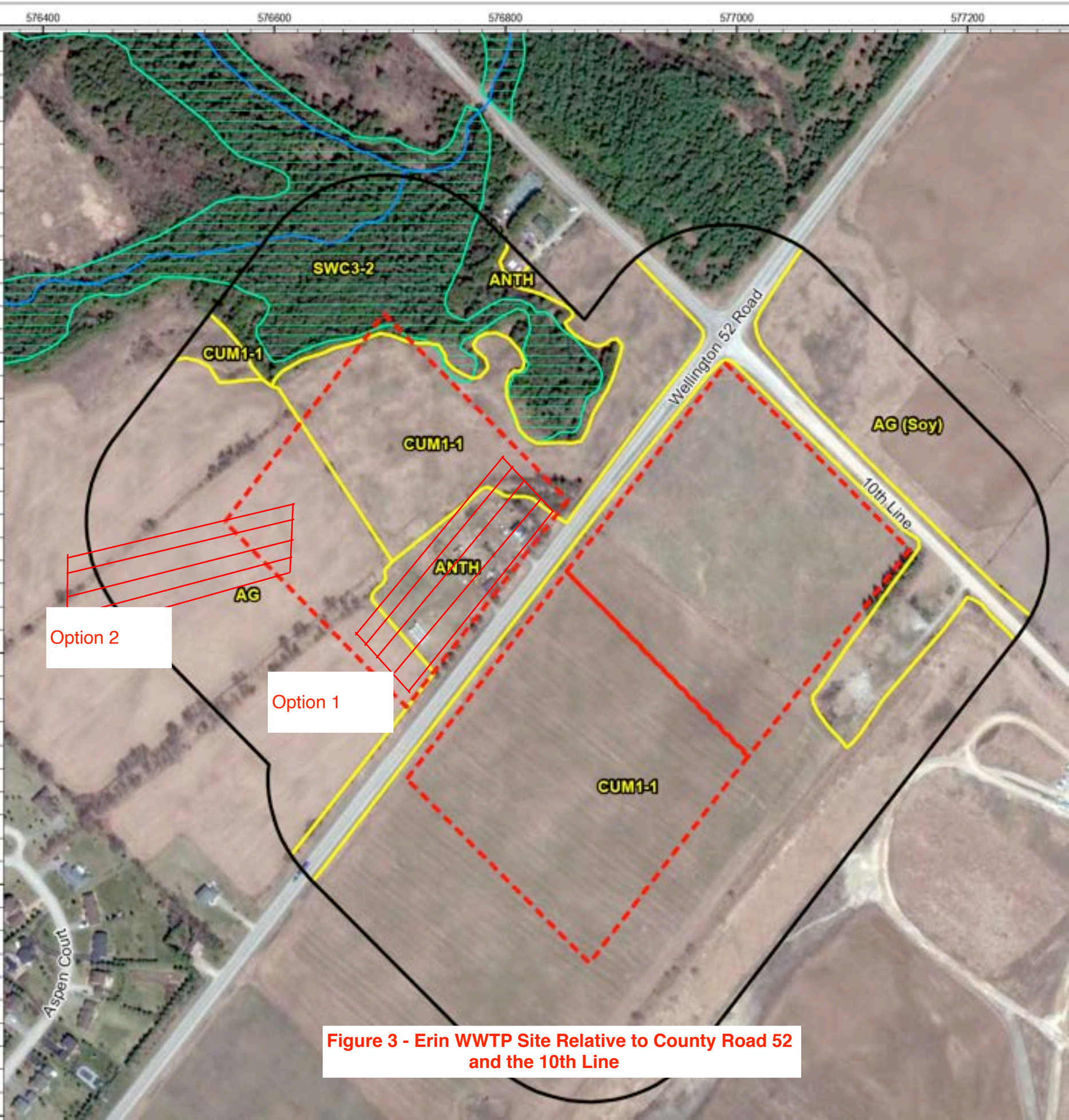

Figure 3 - Erin WWTP Site Relative to County Road 52 and the 10th Line