

LAKESHORE GREENHOUSE STUDY FINAL REPORT

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EXECUTIVE SUMMARY

- In 2019, Council reacting to public complaints in Kingsville and Leamington, where there is an extensive large scale greenhouse farm (LSGF) industry, directed Lakeshore Administration “to bring back a report on a light pollution by-law relating to greenhouses”. Subsequently Council enacted an Interim Control By-law (ICBL) to be lifted once a study had been completed.
- Based on a high-level environmental scan which informed the Terms of Reference (see **Appendix “A”**), SSPL was retained to undertake the study in February 2022, the proposed report was expanded to cover a potential wide range of effects, positive and negative, from LSGF’s.
- These effects included: financial; land use compatibility (consisting of lighting, odour, girdling, employee housing and eventually, wind turbines); environmental impact and climate change.
- Research has been based on extensive interviews with those with active experience and interests in LSGF’s, a comprehensive public consultation process, and various related documents.
- Although many sources were tapped, the most valuable information was provided by the Ontario Greenhouse Vegetable Growers Association (OGVG); the Municipality of Leamington Development Review Team, and Town of Kingsville Planning Department; Essex Region Conservation Authority (ERCA); the Lower Thames Valley Conservation Authority (LTVCA); and public submissions.
- The effects of lighting, odour, girdling, wind turbines, and environmental impact can be addressed through official plan policies and zoning regulations. Financial effects can be dealt with through an updated Lakeshore Strategic Plan and climate change effects through modern policies already found in the draft Lakeshore Official Plan awaiting final approval.
- Following the completion of the public consultation process, Council adopted a resolution on October 12, 2022 opposing LSGF’s as a permitted land use in Lakeshore for a variety of reasons (see **Appendix “B”**).

- Although the motion provided clarity previously lacking as to the strategic direction Lakeshore wishes to follow with respect to LSGF development, this study can not recommend prohibition of LSGF's as a land use policy, given the overt conflict such a policy has with Provincial policy.
- This study has noted that four further studies need to be completed, however before any LSGF development can occur, namely:
 - Regional stormwater assessment
 - Implementation of water quality monitoring program
 - Completion of Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) study regarding greenhouse lighting and other adverse effects
 - Determination of financial impact on Lakeshore
- This study concludes with the articulation of four option for Council action:
 - Do nothing – existing inadequate policies / regulations will remain in place after the Interim Control By-law (ICBL) expires on March 9, 2023
 - Proceed in accordance with the original Terms of Reference – while LSGF would continue to be recognized as an agricultural use in the Official Plan, no development would be permitted until after the four studies referenced above have been completed. The zoning by-law would be amended so as to delete LSGF's as a permitted agricultural use.
 - Restrict LSGF development within a described geographical area, a sort of greenhouse business park – significant research would be required to develop policy to establish such an area.
 - Prohibit LSGF development in Lakeshore. There would likely be substantial pushback from the Province and industry stakeholders.

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LAKESHORE GREENHOUSE STUDY

1.0 FOREWARD

- Previous drafts of this study prepared prior to the Public Consultation Component in the process were based on a Terms of Reference (ToR) which in turn relied on a strategic direction which contemplated LSGF's as potentially desirable economic development. However, following the public consultation, Council adopted a resolution opposed to LSGF in Lakeshore (see **Appendix "B"**) significantly affecting the study's strategic approach and thus the ToR. The final study version which follows has been altered to align with this new direction as reasonably close as possible and still be consistent with Provincial policy.

2.0 INTRODUCTION

2.1 Background

- In 2019 Council for the Municipality of Lakeshore, reacting to public complaints in other Essex County municipalities where there was existing substantial greenhouse development, directed Lakeshore Administration "to bring back a report regarding a light pollution by-law relating to greenhouses."
- Eventually Storey Samways Planning Ltd. (SSPL) was retained to provide a study with regard to not only lighting but to consider all effects, positive and negative, of potential expansion of the large-scale greenhouse farm (LSGF) industry into Lakeshore.
- For the purposes of this report, LSGF's are considered to be greenhouse operations which include structures under glass over five (5) acres in area. No operations of this magnitude presently exist in Lakeshore.

- 2.2** The study Terms of Reference are attached as **Appendix "A"**.

2.3 Purpose

- Identify possible effects / impacts of Large Scale Greenhouse Farm (LSGF) development

2.4 Goals

- Prepare updated Official Plan policies and zoning regulations to be consistent with Council direction and the Provincial Policy Statement (PPS).
- Provide recommendations to Council for further study / activities beyond the scope of this report.

2.5 Greenhouse Industry Today

- There are approximately 3500 acres of LSGF found mainly in Leamington, Kingsville, and to a lesser extent, Chatham-Kent.
- In Essex County these are bunched between the settlement areas of Kingsville and Leamington, and along the Highway 77 corridor between Leamington and Staples.
- In Chatham-Kent they are scattered widely throughout that municipality.
- The last 10 years has seen an annual growth of around 5 %.
- Primary crops are tomatoes, cucumbers, and peppers, but lettuce, eggplant, strawberries and other berries, melons and limes are being grown as well.
- There are approximately 10,000 migrant labourers in the Leamington, Kingsville and Chatham-Kent LSGF workforce. It is estimated that there are another 7,000 direct domestic employees.

- Challenges facing LSGF operations include managing the following processes:
 - Material ordering lead times, particularly from offshore suppliers
 - Supply chain constraints
 - Worker Labour Market Impact Assessment (LMIA) approval process
 - Land acquisition
 - Negotiating supply of water, natural gas, and 3-phase hydro with utilities
 - Municipal and other government agency permitting processes
- The reader is directed to the Ontario Greenhouse Vegetable Growers (OGVG) website (<https://www.ogvg.com/>) for fulsome descriptions of all aspects of the Greenhouse industry.

2.6 Planning Documents

- The Ontario Planning Act controls land use, among other things, in Ontario.
- There is a hierarchy of land use policy documents as follows:
 - Provincial Policy Statement (PPS)
 - County of Essex Official Plan (COP)
 - Municipality of Lakeshore Official Plan (LOP)
- The LOP policies provide guidance to the Lakeshore Zoning By-law. It is in this document that the regulations concerning land use, such as Large Scale Greenhouse Farms (LSGF) are found.

- For the purposes of this study, LSGF's are considered to be an agricultural use, and therefore, from a basic perspective, are consistent with the PPS, and in conformity with the COP and LOP.
- The Lakeshore Strategic Plan does not refer directly to agriculture or greenhouse development
- There are two strategic goals (SG) which have some relevance to greenhouse industry development:
 - SG 1.4 – encourages economic development and tourism and mentions upcoming update of the Municipality of Lakeshore Economic Development Strategy. Council / administration should address potential greenhouse industry expansion in Lakeshore as part of that update, given the October 12, 2022 Council motion (**Appendix "B"**)
 - SG 2.1 – speaks to the maintenance and upgrading of roads and other infrastructure. Access and local road improvements should be an important consideration of any LSGF development application.

2.7 Format

- Following this introduction are the following sections:
 - Agency and Stakeholder Consultation / Documents reviewed
 - Constraints / Opportunities to LSGF development in Lakeshore
 - Analysis of Effects
 - Public Consultation
 - Provincial Policy Statement
 - Conclusion

3.0 CONSULTATION / DOCUMENTS REVIEWED

3.1 Documents

- Greenhouse Development Feasibility Study, Agri-Development Kent – January 2001
- Agricultural Economic Impact and Development Study for Chatham-Kent, Essex and Kent Federations of Agricultural, August 2002
- Provincial Policy Statement
- County of Essex Official Plan
- County of Essex Regional Energy Plan
- Official Plans for Chatham-Kent, Leamington, Kingsville and Norfolk
- Town of Kingsville – Temporary Foreign Worker Housing Study, WSP, June 2022
- Municipality of Lakeshore Strategic Plan
- Multiple websites / articles

3.2 Consultation / Interviews

- Municipality of Leamington – Development Review Team
- Municipality of Lakeshore – various municipal departments, Economic Development and Engineering Services pending
- Chatham-Kent Planning Department – environmental planner, Director of Planning

- Ontario Ministry of Food, Agriculture, Food and Rural Affairs (OMAFRA)
– policy planner
- Ministry of Municipal Affairs and Housing
- Ministry of Transportation Ontario (MTO)
- WSP – planning consultants for Lakeshore and Kingsville
- Citizen’s Group – Norfolk County
- Hydro One
- Enbridge
- Ontario Greenhouse Vegetable Growers
- Greenhouse builder / operator
- Canadian Renewable Energy Association (CanREA)
- Essex Region Conservation Authority (ERCA)
- Lower Thames Valley Conservation Authority (LTVCA)
- Extensive public consultation

4.0 CONSTRAINTS / OPPORTUNITIES

- As noted in Section 2.4 above, serious constraints for LSGF developers included managing negotiations with utilities; land acquisition; and a timely municipal permitting process. This is discussed further in the following section.

- Both Hydro One and Enbridge have made applications to the Ontario Energy Board for new transmission lines, citing the need to service the expanding greenhouse industry in their Expressions of Interest.
- **Appendix “C”** indicates the following in regard to transmission facilities:
 - Chatham to Lakeshore Hydro One, the additional transmission line, enters Lakeshore just north of Tilbury, follows 401 more or less, passes through the north end of Comber, and terminates in a new switching station located approximately at the intersection of CR 46 and Rochester Townline Road.
 - Enbridge Panhandle Extension project enters Lakeshore south of Tilbury and terminates at the Richardson Side Road, halfway between CR 46 and Desimpel Road.
 - Enbridge Leamington Interconnect runs from Staples, along CR 8, and connects to the Kingsville East Line, just east of the CR 27 intersection.
- Completion of these projects is expected to occur by the end of 2023 (Hydro One and Panhandle) or the end of 2024 (Leamington Interconnect). The provision of these enhanced utilities should result in increased opportunities for Large Scale Greenhouse development.
- Water Supply
 - Generally, there are significant water supply constraints in Ward 5 and Ward 6 for LSGF uses
 - **Appendix “D”** shows the water supply service area boundary for the Stoney Point Water Service Area, found mostly in Ward 6
 - **Appendix “E”** shows the Union Water supply service area boundary, found mostly in Ward 5

- Note the narrow area adjacent to the Chatham-Kent boundary which is not in a service area. Water supply to this area would be subject to a private arrangement with Chatham-Kent
- Groundwater – it is proposed that groundwater aquifer not be used as a source for water
- The remaining area of Lakeshore is serviced by the John George Water Treatment plant in Belle River
- Wastewater Treatment
 - Generally, there are no wastewater treatment facility service areas for lands designated Agricultural in Wards 5 and 6
 - There are treatment facilities in Stoney Point and Comber servicing those communities but which are at capacity today
- Stormwater Management
 - Stormwater management is subject to local conservation authority and municipal approval
 - The Leamington Stormwater Master Drainage Study for Reid Drain, Silver Creek, and Bay Creek Watersheds Study by Stantec, dated July 24, 2020 recommended a regional stormwater management approach where LSGF development is proposed. The study CONCLUSION is attached as **Appendix “F”**. It is noteworthy that all three watersheds continue through Lakeshore and discharge into Lake St. Clair. It is proposed in the Lakeshore Greenhouse Study that a study similar to the Leamington Stantec study be prepared prior to LSGF development occurring in Lakeshore.
- Highway 401 essentially bisects Lakeshore east to west and is easily accessed by a comprehensive County Road system.

- The Ministry of Transportation Ontario (MTO) has provided the access restrictions which will apply to Highway 77 between Staples and Comber. These requirements should be incorporated into proposed official plan amendment policies.
- The Ministry of the Environment, Conservation and Parks (MECP) has submitted provisions regarding greenhouse operations which may require approvals such as Environmental Compliance Approval (ECA), permit or license from MECP. The requirements should be incorporated into any proposed official plan amendment policies.

5.0 EFFECTS OF LSGF DEVELOPMENT

5.1 Financial / Economic Development

5.1.1 Multiplier Effects

- An important way of determining the impact on an economy subject to substantial new investment is called the Multiplier Effect (ME). Generally, the greater this effect, the more positive the effect on an economy and is usually expressed through job creation and improved revenue streams.
- Research for this report did not uncover any definitive ME study for LSGF development.
- OGVG commented as follows – “the multiplier is a moving target, however provincially we approximate more than 2 billion dollars contributed to the Gross Domestic Product [GDP]. We are doing a research study which will assess this, expected to be complete by the fall of 2022.” Many community benefits arising from LSGF activity described in a recent University of Guelph study were summarized in a media release, attached as **Appendix “G”**.

- The two agricultural economic impact studies from 2001 and 2002 listed in Section 3.1 both speak to an ME of 6.0, although there is no explanation provided for this number.
- Other analyses, which may not be wholly reliable, suggest a number of 2.5 to 4.0 based on certain aspects of LSGF – primary industry, food processing, reliance on sophisticated technology – which have been studied in other industries.
- Ryan Donally, economic development officer for Lakeshore, prepared a robust submission at the request of SSPL regarding multiplier effects based on information available to him, which is attached as **Appendix “H”**. Mr. Donally’s analysis showed a clear positive effect with regard to Total Sales, Total Wages, and Total Jobs.
- There is anecdotal information that suggests a significant ME from LSGF investment.

5.1.2 Financial Impact on Municipality

- Similar to the Multiplier Effect, our research did not uncover any specific analysis on net impact of LSGF’s on municipal finances.
- LSGF’s are classified as an agricultural use and are subject to the same mill rate as a normal farm. The assessed value per acre of LSGF’s however are approximately 15 to 20 times of a normal farm, suggesting a substantial property tax revenue increase.
- Discussions with Leamington suggests costs incurred by the municipality and its ratepayers occur in the provision of municipal water and necessary road improvements and ongoing maintenance which are not fully covered by LSGF development.

5.1.3 Summary Financial / Economic Development

- Despite the lack of more precise statistics on the Multiplier Effect, what information does exist suggests LSGF's have a significant positive impact on local economic development.
- Similarly, it is assumed that the impact on municipal property tax revenue likely exceeds the cost to the municipality. Lakeshore should review the ability to fully recover costs, possibly through development charges, associated with the provision of municipal water (and possibly wastewater treatment) prior to any approval for a LSGF use. Also, Lakeshore should ensure that the cost of road improvements and maintenance associated with LSGF is covered through development agreements.
- Finally, it should be recognized that to some extent, Lakeshore already benefits from the LSGF development in Leamington and Kingsville as follows:
 - There is a probability that commercial / industrial enterprises in Lakeshore provide support services to the Leamington / Kingsville LSGF's.
 - It is estimated that roughly 50% of the property tax revenue presently generated by LSGF development goes to the County of Essex and the school boards, institutions which provide services to the ratepayers of Lakeshore.

5.2 Land Use Compatibility

5.2.1 Lighting

- The provision of lighting within a greenhouse facility can be a complex undertaking with impacts on the micro growing environment, depending on the crop being grown.

- As noted, Lakeshore Council directed Administration to undertake this report initially based on lighting complaints regarding existing facilities in Leamington and Kingsville.
- It is noteworthy that Leamington recently approved a nuisance by-law under the Municipal Act, with the support of the Ontario Greenhouse Vegetable Growers Association (OGVG) to require the abatement of interior greenhouse lights in existing facilities.
- It is generally accepted practice today that new greenhouse construction is equipped with the appropriate blackout curtains to ensure the desired light abatement relative to sensitive land uses, such as nearby dwellings, is achieved. For new construction, lighting abatement is reviewed and enforced through a site plan approval process under the Planning Act.
- Lighting abatement was a primary concern raised in the public consultation, based on the experience in Leamington. Recently, OMAFRA has provided an information pamphlet “Managing Nighttime Greenhouse Light Emission” which is attached as **Appendix “I”**. This document notes that light abatement through ceiling curtains of less than 1% can be achieved, and less than 2% for wall curtains. These standards should be considered for any proposed official plan policies as well as Dark Sky compliance for exterior fixtures.

5.2.2 Odour

- The odour effect applies to cannabis operations.
- In an evidence brief, dated April 2018, Public Health Ontario stated that it could find no studies which showed exposure to cannabis odours resulted in effects on health.

- The draft Lakeshore Official Plan contains modern policies with regard to cannabis facilities, and as such, no further updating is considered necessary.
- Once the draft OP comes into effect, the Lakeshore Comprehensive Zoning By-law 2-2012 will be updated to reflect the new OP policies.
- Finally, it is our understanding that at present, there is no demand for new cannabis production facilities, unlike the growth being experienced in the LSGF section.

5.2.3 Girdling

- The Greenhouse Development Feasibility Study from January 2001, mentioned in Section 3.1 above, observes that the growth of the greenhouse farm industry in proximity to the Leamington / Kingsville settlement areas, in order to access municipal services, has had an undesirable “girdling” effect on the direction of expansion in those urban areas.
- In discussion with the Lakeshore Planning Department and the draft Lakeshore Official Plan consultant it was agreed that long term expansion of the primary settlement area, i.e., from CR22 to Manning Road, would be in a southerly direction towards CR42. As much as this area is presently designated Agriculture, it was further agreed that this area should be a “no build” area for Large Scale Greenhouse Farms, so as to avoid the girdling effect presently in the Leamington / Kingsville area. Refer to **Appendix “J”**.
- There was also discussion regarding creation of a “no build” zone along Manning Road between CR42 and 401. It is our opinion there is insufficient justification for this restriction at this time, but suggest that the Municipality may wish to study this matter more closely in the future.

5.2.4 Employee Housing

- Housing for LSGF labour is tied to migrant workers' rights. Their rights are governed by many different federal and provincial laws, immigration rules, employment standards, labour laws, occupational health and safety standards, as well contracts and "common law".
- Specific legislation includes:
 - Employment Standards Act 2000 which applies to all Canadians, as well as migrant workers
 - Human Rights Code
 - Employment Protection for Foreign Nationals Act
- There area also a number of migrants workers' rights organizations.
- The reader is directed to the recently completed Temporary Foreign Worker Housing Study, by WSP and recently submitted to the Town of Kingsville (<https://kingsville-pub.escribemeetings.com/filestream.ashx?DocumentId=27387>). This report provides a comprehensive review of the many factors affecting migrant worker housing. It has been received by Kingsville Council and implementing official plan policies and zoning by-law amendments have finally been approved.
- Until the outcome of the Kingsville process is complete, and the efficiency of its implementing zoning by-law is determined, and also until a best-practices document is provided by senior government, we suggest the default position in a proposed OP amendment should be that all employee housing occur on the subject LSGF site.

5.2.5 Greenhouses and Wind Turbines

- After commencement of the study, it came to our notice that the site plan configuration of a large new greenhouse development in Chatham-Kent had been altered after a complaint from a wind turbine operator on a neighbouring lot.
- This raised two questions:
 - Since the greenhouse project was subject to only site plan approval, which does not require any public notification, how did the wind turbine operator discover the project?
 - What was the rationale for the re-configuration? Third-hand information suggests it was due to the proximity of the proposed migrant worker housing facility. Direct confirmation of the process and the concern(s) that were raised by the Chatham-Kent Planning Department followed.
- There are 160 wind turbines in Lakeshore, mainly in Wards 5 and 6 which due to their rural nature, are most likely areas for LSGF development. Of these, 72 are north of 401, and 88 are south. Please refer to **Appendix "K"**.
- There are two items noted with respect to the individual wind turbine locations:
 - Each turbine has a 550-metre radius circle drawn around it, representing the accepted minimum distance required from a turbine for adequate sound attenuation from a sensitive land use. It may be the position of the wind turbine operator that this should be the distance maintained by migrant worker housing.

- The lot on which each turbine sits is shown shaded on **Appendix "K"**. It is assumed that these lots will not be suitable for LSGF development.
- The Canadian Renewable Energy Association (CanREA), which represents the wind energy industry was consulted on this issue but it took no position.
- Three approaches were considered where existing wind turbines would be in close proximity to proposed LSGF's:
 - Do nothing. It is possible that any issues can be worked out with no need for a municipal land use planning policy.
 - Provide an official plan policy requiring consultation with the wind turbine operator / owner during the site plan approval process.
 - Provide actual LSGF setbacks from existing wind turbines in the zoning regulations, particularly for worker housing. There are no regulations in the Lakeshore Zoning By-law prescribing minimum distance separations between proposed sensitive land uses, such as dwellings, and existing commercial wind turbines.
- The CanREA representative supported the second option, and it is proposed that this be incorporated into any official plan amendment.

5.2.6 Riverine Water Quality

In an interview with the ERCA water quality expert, it was noted that a five-year study, ending in 2016, monitoring riverine water quality found excessive amounts of micronutrients and trace metals in areas dominated by greenhouse development when compared to row crop areas, i.e., little or no greenhouse development.

Once discovered, steps were taken to address this situation, but a subsequent follow-up study, to be made public in early 2023, suggests that these contaminants associated with greenhouse effluents may still be unacceptably high. Refer to **Appendix “L”** for the Abstract of the original study.

It is proposed that no new LSGF development be approved in Lakeshore until a water quality monitoring program is established and such a provision be included in any proposed official plan amendment.

5.3 Climate Change Goals / Objectives

- Section 1.8 of the Provincial Policy Statement, entitled Energy Conservation, Air Quality and Climate Change, begins with “Planning authorities **shall** [SSPL emphasis] support energy conservation and efficiency, etc...” – the key word “shall” makes this a mandatory PPS policy.
- The County of Essex Regional Energy Plan, 2019, has specific references to greenhouse development:
 - Efficient greenhouses is a Strategic Direction, the rationale being that “the greenhouse sector accounts for 38% of the energy consumed in Essex County...the greenhouse sector accounts for 41% of emissions and 15% of energy and municipal water costs”.
- Section 4.2.4, Energy Conservation and Generation, Air Quality and Climate Change Adaption of the Lakeshore Draft Official Plan contains up-to-date policies describing various ways the municipality can achieve climate action goals through the development approval process. These policies should be applied to greenhouse proposals.
- The environmental planner for Chatham-Kent, an expert on different ways to address climate change-related net zero goals was interviewed. Highlights, particularly related to LSGF’s were as follows:

- Likely the best way to meet net-zero goals for greenhouses would be through on-site energy generation with the capability to feed back in to the grid.
 - LED lighting is a common “checklist” item most suitable for greenhouses.
 - Need to encourage life-cycle costing in energy model, not only the immediate impact.
 - Referenced Town of Halton Hills Green Development Standards which requires Planning Act development applications to meet certain minimum climate action plan measures as a condition of approval.
 - Use of incentives through Community Improvement Plan (CIP) - like policies to encourage net zero planning, for instance, in exchange for reduction in fees and property taxes. However special legislation is required for this approach.
- The SSPL opinion is that Lakeshore has the necessary climate change policies in the draft official plan, and no special greenhouse-related policies are necessary.

6.0 PUBLIC CONSULTATION

6.1 Overview

The initial draft report, dated July 15, 2022 was submitted to the Lakeshore Planning Department for comment, and a subsequent report, incorporating the staff comments was placed on the municipal website in early August, with public input welcome.

Subsequently several formal public input presentations were planned as follows:

- August 23, 2022 (afternoon) – a virtual PowerPoint presentation was provided with limited attendance and comment.

- August 23, 2022 (evening) – a public information centre (PIC) was held at the Atlas Tube Recreation Centre (ATRC). Approximately 170 people attended which included an impromptu Question and Answer period.
- September 1, 2022 – a formal in-person meeting was held at the Comber Community Hall, which featured a PowerPoint presentation, similar to the August 23 presentation, followed by an extensive Question and Answer period. The meeting was chaired and organized by Lakeshore staff. Approximately 270 people attended.

Public submissions were received as follows:

- 77 emails received between early August and September 6.
- 9 comment sheets received as part of the August 23 PIC and September 1 community meeting.
- A summary of 21 comments recorded by Lakeshore staff at the September 1 meeting.
- A petition, opposing the greenhouses, including reasons why, with 1656 electronic and original signatures, dated September 29, 2022 was received by the Municipality.

While below we provide a response to the specific concerns raised, we generally observe that virtually all submissions were opposed to the introduction of Large Scale Greenhouse Farms (LSGF), based on the impacts of such development experienced in Leamington and Kingsville.

Finally, it should be noted that all original submissions are retained by, and can be accessed from, the Planning Department.

6.2 Written Public Submissions

These consist of the 77 emails and nine comment sheets received. Many people appeared to have spent considerable time preparing their submissions. As one might expect there is considerable overlap among the concerns raised. Below I have identified the various issues and provide comments for them.

1. *Lighting Pollution – this concerns deals with light escaping through the walls and roof of greenhouses as well as exterior lighting. One writer*

provided an article demonstrating the impact of unregulated night time lighting on insects, with a subsequent cascading effect on bird population.

Comment: recent preliminary reports from OMAFRA notes that there is ceiling curtain technology that will reduce light transmission to less than 1%, and wall curtain light transmission to less than 2%. Also, the requirement for a photometric plan which is "dark sky" compliant, required by a site plan agreement has been included in the original draft Official Plan Amendment (OPA). It is our understanding that OMAFRA is preparing a more detailed document which should include best practices for lighting abatement. As noted in this discussion it is our position that no LSGF development occur until the OMAFRA document has been issued.

2. Observatory Setback – similar to item 1 above there was a concern raised regarding the location of a LSGF facility near the existing Hallam Observatory owned by the Royal Astronomical Society of Canada Windsor. It was requested certain light abatement conditions be applied to any development within a 4 km radius.

Comment: further discussion is required on this matter. In the meantime, as noted above, no LSGF should be forthcoming prior to the OMAFRA document regarding lighting.

3. Rural Landscape – LSGF are an aesthetic blight on the rural landscape

Comment: possible OP policies could include landscaped open space minimums and site plan subject to standards prepared by a landscape architect. Administration can require a landscape plan prepared by a landscape architect to reduce or eliminate site specific design impacts.

4. Odour – this item was raised in many submissions and is most often relates to Cannabis Production Facilities. However, there is also odour arising from composting which needs to be recognized.

Comment: regarding cannabis odours, the Lakeshore Official Plan contains modern policies regarding Cannabis Production Facilities. The zoning by-law needs to update the Medical Marijuana facilities regulation. Regarding composting odours, the OMAFRA best practices, in consultation with the Ministry of the Environment, Conservation and Parks (MECP) should provide

guidance as to the appropriate means of regulation, i.e., nutrient management plan or Environmental Compliance Approval (ECA).

5. Climate Change – greenhouses are recognized as being major energy users and greenhouse gas emitters

Comment: as noted in the Greenhouse Study Report, Lakeshore has comprehensive modern policies regarding energy conservation and climate change adaptation, which staff can apply to individual applications and implement through site plan control agreements. Senior government action is required though as to the appropriate municipal role in achieving national and provincial goals such as net zero emissions by 2050.

6. Economic Development benefits are overrated

Comment: limited information, as reported, is available regarding economic development impact which suggests it is positive. Also, as noted, OGVG expects a more comprehensive review be available in the next few months. Less information though is available regarding overall financial impact on municipalities. It is our conclusion that prior to development of any LSGF that Lakeshore undertake a comprehensive review of the impact and the tools available.

7. "Girdling" concerns – no-build zone should be extended around other settlement areas in Lakeshore besides the Belle River / Amy Croft area

Comment: the "no-build" zone as presently configured can be somewhat defended although some may interpret it as being in conflict with the Provincial Policy Statement (PPS). At present, potential expansion of other settlement boundaries (Stoney Point / Comber / Lighthouse Cove) is unlikely due to various constraints. However, a 300 m setback from these areas of LSGF facilities presently in place is intended to be maintained. It should be noted that 300 m is the minimum setback recommended by the Ministry of the Environment, Conservation and Parks (MECP) for a Class III Industrial Use from a sensitive land use. Class III uses are considered to be those with the greatest potential impact.

8. Employee Housing – there are many concerns / impacts raised in submissions on this issue including human trafficking, undocumented workers, lack of support services for workers, adequate amenities,

adequate housing, and social impact on downtown core (Leamington as an example).

Comment: as noted Kingsville has undertaken a comprehensive study to identify and address many of these concerns, and recently approved an Official Plan Amendment and zoning amendment. It should be recognized that to a great extent housing issues in Leamington and Kingsville are existing and policies / actions proposed are dealing retroactively. As noted in the study pending more best practices information / guidelines, it is our position that all housing be accommodated on site.

9. Residential property values will be negatively impacted

Comment: there are no studies to confirm this impact, only anecdotal information. However, if LSGF are properly regulated and the poor planning outcomes associated with existing development are avoided, the property value impact should be minimal.

10. Smaller cash crop farming operations are negatively impacted – cost of land driven up; light pollution; spraying restrictions; trucking impact

Comment: in a way this concern suggests these are competing agricultural uses. We suggest these complaints be made to the Ontario Federation of Agriculture (OFA), OMAFRA, or other agricultural organizations.

11. LSGF are incompatible with other uses found commonly in agricultural areas, such as residential and other cash crop farming

Comment: see comments on items 3 and 10 above.

12. Impact on roads and other municipal infrastructure

Comment: see comments on Item 6.

13. Innovative approach to curtains – one writer proposed that curtains be combined with solar panels

Comment: OGVG should welcome innovative approaches but review of such an approach is beyond the Terms of Reference of this study.

14. LSGF are an industrial use and remove prime agricultural land from food production

Comment: it is the provincial position that LSGF are considered an agricultural use and as such are permitted on prime agricultural land. We do note that Council has raised this point in its motion and communicated its opposition to LSGF for this reason (and others) to the provincial government.

15. Introduction of LSGF into Lakeshore is a “done deal”

Comment: this study is following a comprehensive process which includes substantial opportunity for timely public input, prior to any decisions by Council. The Council motion opposing LSGF certainly suggests this is not a “done deal”.

16. Overly reliant on OGVG information – Council requires more information than provided in the Greenhouse Study to make a decision

Comment: as noted in this report, we relied heavily on OGVG, Leamington, Kingsville, the conservation authorities and public input. It is agreed that having substantially completed the research phase, received public submissions and taken the Council motion into account, there remains considerable uncertainty and we agree Council requires more information prior to making a decision.

17. Stormwater management needs to be considered from a regional perspective

Comment: we agree after consulting with ERCA and the LTVCA and include such a study be required prior to any LSGF development.

18. Impact of greenhouse development / operations on water quality needs to be addressed

Comment: we agree after consulting with ERCA and the LTVCA and include the need for a water quality monitoring program be implemented prior to any LSGF development.

19. Wastewater treatment plans should be required

Comment: we agree and meeting MECP requirements will be part of any draft OPA policies.

20. Plan regarding waste management, including diversion from landfills should be required

Comment: we agree and meeting MECP requirements will be part of any draft OPA policies.

21. Woodlots need to be protected

Comment: there are well-developed existing policies to protect natural heritage features in Lakeshore such as woodlots and wetlands.

22. Will the Plains Medstream pipeline corridor be affected?

Comment: existing easements, right-of-ways and all other encumbrances registered on title would have to be respected.

23. The moratorium needs to be extended

Comment: the "moratorium" is in fact an Interim Control By-law (ICBL) which provides a municipal Council authority to suspend types of development articulated in a by-law under the Planning act for a period of one year, with the ability to renew the by-law for a second year while the development issue is studied. The second renewal expires in March 2023.

As noted in other comments we recognize more study is required however in certain areas before LSGF development can proceed and we are reviewing ways to achieve this end.

24. By covering open fields otherwise devoted to cash crop farming LSGF's reduce the pollination effect

Comment: this is not an issue raised by OMAFRA to date, but we will review it.

25. LSGF's should be limited to a certain designated area where impacts can be better managed and municipal services / utilities more efficiently provided

Comment: as noted in the study there is much support for this approach, however it is well beyond the Terms of Reference. We do suggest Council consider this option.

26. LSGF building permits should be approved by Council

Comment: the process for LSGF development most likely to be followed would be Council adoption of Official Plan policies and amendments (final approval by the County); zoning amendments approved by Council; site plan

approval by staff development review team; building permits approved by Lakeshore Building Department under the Ontario Building Code Act.

27. LSGF development should occur based on the issuance of permission, rather than request for forgiveness

Comment: we agree.

28. Impact of LSGF on migration route of birds and monarch butterflies should be looked at

Comment: Lakeshore has the ability to require an environmental impact assessment which could include species-at-risk review under the Endangered Species Act.

29. Water quality testing should be carried out by a third-party

Comment: this is a matter where Lakeshore would rely on MECP oversight, likely through the provision of an Environmental Compliance Approval (ECA).

30. What happens when a LSGF reaches obsolescence and its continued operation is no longer economically feasible

Comment: this is an excellent question for which we have found no research or discussions. This should be raised with OGVG and OMAFRA.

31. There should be a minimum fixed distance separation from all settlement areas

Comment: the greenhouse study proposes 300 m.

32. Noise from greenhouse activities such as refrigeration trucks

Comment: the Municipality has the ability to require an acoustic study and manipulate the location of sound producing activities through site plan control.

33. Vector control program needed (e.g., flies and waste bins)

Comment: vector control can be made part of a site plan development agreement.

34. Lakeshore should consider an all-encompassing nuisance by-law

Comment: this item is beyond the scope of this study. Council should seek advice from legal counsel.

35. OMAFRA should provide a best practices document addressing all identifiable adverse effects from LSGF development

Comment: we agree.

36. Lakeshore should conduct its own research regarding climate change

Comment: refer to our comments in item 6.2.5

6.3 Verbal Questions / Comments

Following are a list of verbal comments raised at the September 1 community meeting at the Comber Community Hall, with our responses.

1. Has any land been purchased so far by Greenhouse operators?

Comment: unknown although we are aware of rumours.

2. Greenhouse operations account for a large percentage of energy used in the County. How can this be justified? Is this progress?

Comment: this is true as noted in the study. The Lakeshore Official Plan (LOP) includes energy conservation / reduction policies which can be applied through development agreements. Better federal / provincial direction on the role of municipalities is required however.

3. Is this a done deal? ERCA and LTVCA not mentioned in the presentation; a traffic study is needed; greenhouses should be in designated areas (commercial and industrial areas) versus a free for all approach – i.e., allowing anywhere in the agricultural area.

Comment: ERCA and LTVCA staff have been interviewed multiple times. Their comments / concerns are being addressed in the final draft of the study. Refer also to 6.2.25 above.

4. Greenhouses should not be permitted.

Comment: Council has adopted a motion to this effect and forwarded it on to other municipalities and the provincial government. It should be noted this issue has been raised in the past and it is provincial policy that LSGF be considered an agricultural use and permitted in agricultural areas.

5. Would Development Charges apply to Greenhouses?

Comment: yes, but Lakeshore would need to undertake a financial impact analysis to determine what these charges should be.

6. In the Municipal Strategic Plan, agriculture is not mentioned. Greenhouses are not a priority of Council (as expressed in the Strategic Plan).

Comment: this is true as noted in the study. In effect, Council amended its Strategic Plan with its October 12 motion opposing LSGF's in the municipality.

7. Who would deal with the rotting vegetables? Rotting vegetables create a bad smell in Kingsville/Leamington. (Explained during the response that this is reference to "seconds" which are not sold, but taken to landfills. Could the seconds be composted).

Comment: this issue can be addressed through a development agreement, subject to the requirements of the Ministry of the Environment, Conservation and Parks (MECP), and/or the Ministry of Agricultural, Farming and Rural Affairs (OMAFRA).

8. Why are there not more "no build" zones, similar to the buffer area shown in the draft study near the community of Belle River.

Comment: the designation of specific "no build" zones requires substantial justification to be considered under provincial policy. However, distance separation and impact mitigation measures normally applied to industrial uses to establish setbacks from sensitive land uses, such as residential, are proposed for LSGF's.

9. Concern with waste – old vines go to landfills. Waste is difficult to manage.

Comment: waste management / diversion plans are proposed for LSGF's.

10. Concern with housing for workers. Do not want them housed too close to "Town". Concern with workers having unsafe access to work sites (walking and bicycles).

Comment: as discussed in the study, worker housing is a complex subject. We suggest that the province, through OMAFRA, provide a best practices document. In the meantime, we propose a default position that worker housing be provided on the LSGF site.

11. Want proactive By-laws. Could the agricultural land be brought back after the life of the greenhouse. Could a fund be set up to rehabilitate the land.

Comment: this is an interesting concept beyond the scope of this study, but worth further review. Provincial guidance / input would be required.

12. Managing vegetable waste – need a plan before operation.

Comment: agreed.

13. Development Charges Study needs to be completed to charge the operators the hard and soft services needed to support greenhouse operations.

Comment: see response in 6.3.5.

14. Could this question (Greenhouses or no Greenhouses) be added as a referendum to the Municipal Ballot on election day?

Comment: no comment as election has passed. Council did take action though based on public input in its October 12 motion.

15. Commercial greenhouses have a large number of workers and a large amount of shipping. Also take up agricultural land. They should be assessed (taxed) as a commercial use.

Comment: Province does not agree but this point was made by Council in its October 12 motion.

16. Could there be more Cannabis grown?

Comment: Cannabis operations are subject to separate Cannabis Production Facilities policies found in the Lakeshore Official Plan and the zoning by-law. Subject to conditions set out in the policies and regulations, cannabis can be grown.

17. Greenhouse growth is creating a need for more electricity. Battery storage proposals are needed to supply the electricity. We want to preserve agricultural land. This is endorsed by the provincial government. We don't want greenhouses in Lakeshore.

Comment: refer to comment found in 6.3.4.

18. Negative impact on roads. We need to fix roads.

Comment: refer to comment found in 6.3.5.

19. Have we looked at the Amherstburg By-law? Any proposal greater than a certain size should go to Council.

Comment – yes. The Amherstburg policies / regulations are very similar to the existing Lakeshore policies / regulations.

20. Can we extend the Interim Control By-law beyond March of 2023?

Comment: no. The Planning Act permits Interim Control By-laws (moratoriums in effect) for one year with the potential for a second one-year extension. The second one-year extension expires March 9, 2023.

21. There is a petition for residents to sign. The petition does not support Greenhouse growth in Lakeshore.

Comment: the petition, dated September 29, 2022 has been received by the municipality and is addressed in the next section.

6.4 Petition

The municipality received a petition on September 29, 2022 with 1,656 electronic or original signatures. The petition summary is attached as **Appendix “M”**.

Comment: the issues raised reflect those submitted in the formal publication process and commented on in subsections 6.1, 6.2 and 6.3 above. What is noteworthy is the final statement of the petition:

Until all these issues are legally resolved, we do not want greenhouses in the Municipality of Lakeshore.

This implies that LSGF would be acceptable provided the listed issues have been addressed. Options 2 and 3 presented in this report have adopted this approach for Council action.

7.0 PROVINCIAL POLICY STATEMENT (PPS)

In the earlier drafts of this study, prior to the public consultation component, it was recognized that LSGF's have long been considered an agricultural use and permitted in prime agricultural areas, a fundamental PPS provision.

Since the purpose of this study was to determine the various off-site effects of LSGF's, further scrutiny regarding the consistency of LSGF development with the PPS was delayed until the research was complete, which is now the case. The public consultation phase and the October 12, 2022 Council motion opposing LSGF's also inform a review of the entire PPS which follows.

1.1 Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns

1.1.1 Healthy, liveable and safe communities are sustained by:

a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term;

Comment: Lakeshore must ensure that its financial commitment is sustainable.

c) avoiding development and land use patterns which may cause environmental or public health and safety concerns;

Comment: the Kingsville Leamington Nutrient (KLN) water quality study demonstrates substantial water contamination from LSGF development. A monitoring program and methods to eliminate this impact should be a part of official plan policy.

d) avoiding development and land use patterns that would prevent the efficient expansion of settlement areas in those areas which are adjacent or close to settlement areas;

Comment: the "no build" zone for LSGF development is proposed to prevent the "girdling" which affects Leamington and Kingsville, this area being identified as the long-term expansion of the primary settlement area in Lakeshore.

1.1.4 Rural Areas in Municipalities

Rural areas are important to the economic success of the Province and our quality of life. Rural areas are a system of lands that may include rural settlement areas, rural lands, prime agricultural areas, natural heritage features and areas,

and other resource areas. Rural areas and urban areas are interdependent in terms of markets, resources and amenities. It is important to leverage rural assets and amenities and protect the environment as a foundation for a sustainable economy.

1.1.4.1 Healthy, integrated and viable rural areas should be supported by:

a) building upon rural character, and leveraging rural amenities and assets;

Comment: protecting the rural landscape, which is a key component of rural character, can be enhanced through the use of thoughtful aesthetic site plan standards.

e) using rural infrastructure and public service facilities efficiently;

Comment: there is substantial rural infrastructure in Lakeshore – roads, water lines, drainage schemes – which can be impacted by ill-conceived greenhouse development.

1.2.6 Land Use Compatibility

1.2.6.1 Major facilities and sensitive land uses shall be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities in accordance with provincial guidelines, standards and procedures.

Comment: this is an important policy which protects both sensitive residential uses and the major facilities represented by LSGF's.

1.4 Housing

1.4.3 Planning authorities shall provide for an appropriate range and mix of housing options and densities to meet projected market-based and affordable housing needs of current and future residents of the regional market area by:

b) permitting and facilitating:

1. all housing options required to meet the social, health, economic and well-being requirements of current and future residents, including special needs requirements and needs arising from demographic changes and employment opportunities;

Comment: the municipal role is self-explanatory.

1.6 Infrastructure and Public Service Facilities

1.6.6 Sewage, Water and Stormwater

1.6.6.1 Planning for sewage and water services shall:

d) integrate servicing and land use considerations at all stages of the planning process;

Comment: although considered an agricultural use, LSGF's have many similarities to employment type uses and with similar servicing requirements.

1.6.10 Waste Management

1.6.10.1 Waste management systems need to be provided that are of an appropriate size and type to accommodate present and future requirements, and facilitate, encourage and promote reduction, reuse and recycling objectives. Waste management systems shall be located and designed in accordance with provincial legislation and standards.

Comment: LSGF's produce significant waste and should be subject to policies implementing this PPS policy.

1.8 Energy Conservation, Air Quality and Climate Change

1.8.1 Planning authorities shall support energy conservation and efficiency, improved air quality, reduced greenhouse gas emissions, and preparing for the impacts of a changing climate through land use and development patterns which:

f) promote design and orientation which maximizes energy efficiency and conservation, and considers the mitigating effects of vegetation and green infrastructure;

Comment: the County of Essex Regional Energy Plan study identifies LSGF development as a significant consumer of energy and producer of greenhouse gases and should be a target for climate adaption and energy conservation.

2.2 Water

2.2.1 Planning authorities shall protect, improve or restore the quality and quantity of water by:

- a) using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development;*
- b) minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts;*
- c) evaluating and preparing for the impacts of a changing climate to water resource systems at the watershed level;*
- d) identifying water resource systems consisting of ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed;*
- e) maintaining linkages and related functions among ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas;*
- f) implementing necessary restrictions on development and site alteration to:
 - 1. protect all municipal drinking water supplies and designated vulnerable areas; and*
 - 2. protect, improve or restore vulnerable surface and ground water, sensitive surface water features and sensitive ground water features, and their hydrologic functions;**
- g) planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality;*
- h) ensuring consideration of environmental lake capacity, where applicable; and*
- i) ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.*

Comment: all of the above policies apply to LSGF's and require appropriate policies and best practice standards to ensure the sustainability of water resources.

2.3 Agriculture

2.3.1 Prime agricultural areas shall be protected for long-term use for agriculture.

Comment: preserving prime agricultural land for agricultural uses is a fundamental land use planning policy of the PPS. As noted elsewhere in this report, LSGF's are considered an agricultural use.

8.0 CONCLUSION

8.1 Overview

- Through document review, agency interviews, and public consultation, SSPL was able to assemble information sufficient to provide a reasonable description of the Large Scale Greenhouse Farm industry and its possible effect on land use planning.
- Having said that, it is recognized the preparation and outcomes of important related studies are still in the works and that these reports could ultimately influence policy development.
- Also, it is recognized that important documents – the Kingsville Official Plan update, particularly the portion regarding Large Scale Greenhouse Farms, and the draft Lakeshore Official Plan – are still awaiting approval by the County of Essex, and the final version of these documents, if revised from the draft versions, could also affect suggested Official Plan policies.
- The most important sources of information influencing the suggested policies were the interviews with Ontario Greenhouse Vegetable Growers (OGVG), the Leamington development review team, the Kingsville Planning Department, Essex Region Conservation Authority (ERCA), the Lower Thames Valley Conservation Authority (LTVCA), submissions arising from the public consultation components of the study process, and the October 12th Council motion opposing LSGF development.
- Two issues raised consistently by several groups, but considered outside of the scope of this report were as follows:

- OGVG, on behalf of their members, and the one LSGF operator interviewed, requested that steps be taken from the municipal perspective to improve the municipal permitting system.
- OGVG, Leamington, Enbridge, Hydro One, ERCA, and several public submissions in particular, raised the advantage of creating a LSGF business park, confining development to a specific area of Lakeshore reducing risks to LSGF developers and providing much greater efficiency in the provision of services and utilities and municipal permitting. Improvements to municipal infrastructure benefitting other residents / businesses in Lakeshore and implementing of climate action plans were also raised as benefits. This issue is discussed further as Option 3 in the subsection below.

8.2 Impact of Council Motion and Public Submissions

- The Oct. 12 motion adopted by Council (and we assume also approved by the new Council) has materially affected this study in that Council has expressed clear opposition to LSGF's, whereas the ToR of the study assumed that these facilities, although not welcome, would be accepted subject to an updating of the existing policies and regulations.
- Although generally there is ongoing research/study in many areas by different agencies, we found very little of the "best practices" types of study/documentation, which results in substantial uncertainty as to policy development for the desired outcomes. Primary research needs to be undertaken or completed in several areas of interest which is well beyond the scope of this study and further, likely beyond the scope of municipal responsibility. We note this situation is reflected in the Council motion, in the language of the petition and frequently in the public submissions.
- There are immediate steps discussed further below which will need to be addressed prior to any approvals. In the first draft of this study, we reviewed the provincial Policy Statement (PPS) only from the standpoint of LSGF being considered as an agricultural use in Section 2.3. Having completed the stakeholder/agency interviews and received the public submissions, combined

with the Oct. 12 Council motion, we determined we needed to look at all of the PPS and came to the conclusion that policies/regulations based on appropriate research /studies were necessary to address a variety of other parts of the PPS. Without going into detail, the following policy sections are relevant:

- 1.1.1 – Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns
 - 1.1.4 – Rural Areas
 - 1.2.6 – Land Use Compatibility
 - 1.4 - Housing
 - 1.6 – Infrastructure and Public Service Facilities
 - 1.6.6 – Sewage, Water and Stormwater
 - 1.6.10 – Waste Management
 - 1.8 – Energy Conservation, Air Quality and Climate Change
 - 2.2 – Water
 - 2.3 - Agriculture
- Those areas of study we see as a prerequisite for completion prior to any LSGF development approval are:
 - Regional Stormwater study to identify common release rates in the various watersheds similar to one completed for Leamington
 - Water quality monitoring program, similar to the Kingsville Leamington Nutrient program (a follow up study from ERCA is nearing completion)
 - Best Practices study from OMAFRA regarding Greenhouse Lighting in particular (we understand this is in the works) and other adverse effects from LSGF's in general
 - Municipal Financial Impact Analysis (this is something Lakeshore should undertake in-house)
 - It is not proposed that the Municipality would necessarily pay for the regional stormwater study or water quality monitoring program.

8.3 Options

Four options are presented as a basis for discussion by Council. As noted earlier there are no proposed draft official plan policies or zoning by-law amendments attached to this study, as there were for the earlier drafts. Depending on Council direction, OP policies will be prepared for circulation.

8.3.1 Option 1 – Do Nothing

- The Official Plan (OP) and Zoning By-law (ZBL) contain basic policies that permit LSGF recognizing them as an agricultural use. The original purpose of the study was to update these policies as best we could to recognize the experiences of Leamington and Kingsville so as to avoid the negative impacts in those municipalities. Although these policies/regs are regarded as being consistent with the PPS and County OP (COP), the proper tools developed over time to regulate greenhouses would be lacking. It should be noted that if no action is taken these policies/regs will come back into force when the ICBL expires.

8.3.2 Option 2 – Proceed as Presently Directed by the ToR

- The existing policies are modernized based on the most up to date information, widespread agency consultation and public consultation submissions.
- The present draft policies were prepared prior to final comments from ERCA and the LTVCA, the Council motion and the public consultation process. The Council motion brings into question as to whether the proposed policies are in conformity with the Lakeshore Strategic Plan and as such the draft policies could be subject to substantial revision so as to be more aligned with Council's motion and the expanded review of the PPS described above. To that end we are proposing that no development occur until the four items in 7.2 above are addressed.

As part of this approach, we also propose that the Lakeshore Zoning By-law be amended so as to remove LSGF as a permitted use, i.e., they would no longer be permitted as-of-right as they are under the present regulations.

- Although the Council motion implies making LSGF a prohibited use, giving Council substantial control and time to ensure all the appropriate studies have been completed we are projecting may be an acceptable alternative. We suspect there will be pushback from OMAFRA but I believe there are strong arguments regarding consistency with the PPS. Where we are uncertain is the role of normal farm practices under the Farming and Food Production Protection Act, and how this could affect the ability of the municipality to regulate as it was determined to be a legitimate main agricultural use.
- We note as well that the petition, after listing a number of concerns, states that “until all these issues are legally resolved, we do not want greenhouses in the Municipality of Lakeshore”. We believe the approach listed above will resolve these issues, which implies that under these conditions those signing the petition would agree to LSGF development.

8.3.3 Option 3 – Proceed within a Limited Geographic Area

- This was an approach, to create a sort of business park, described briefly in the study which was supported by many agencies and utilities. It proposes to delineate a certain limited geographic area where LSGF would be permitted. It is noteworthy this approach was proposed in several public submissions as well. It is clearly well beyond the ToR. It would require a separate substantial study to determine how large the area should be; how cost-sharing for utilities and services would be managed; where the business park should be; and what special policies would be necessary. It also might require a partnership with the LSGF industry.
- If Council was interested in this approach, then we would recommend we add this study to the list of other studies to be completed prior to any development as outlined in Option 2.

8.3.4 Option 4 – Prohibition of LSGF

- This approach is not consistent with the PPS and would likely face significant pushback from OMAFRA and possibly OGVG.
- This approach would require an Official Plan Amendment (OPA) either prohibiting LSGF anywhere or simply declaring them not to be an ag use and

thus not permitted in prime ag areas. The zoning by-law would require similar amendment.

- We can not support such an approach as it is clearly not consistent with the PPS.
- It is difficult to predict how this process would play out. We suspect it would become highly politicized with the end result being a compromise looking something like options 2 or 3.
- In one scenario if it goes to an Ontario Land Tribunal (OLT) Hearing and the Municipality loses then it would be wise to have an alternative OPA ready to go, such as option 2 or 3 to replace the existing policies which would otherwise come into force following the OLT decision.
- Predicting any outcome associated utilizing this option is speculative due to the high level of uncertainty associated with it.

8.4 Next Steps

- At the time of writing, it was anticipated this study would be placed on the agenda for the December 13, 2022 Council meeting.
- Preparation of Official Plan and zoning amendments to implement Council's decision on how it wishes to proceed – date and process to be determined.
- Expiration of Interim Control By-law – March 9, 2023. If there are no new official plan policies or zoning regulations pending then the existing policies and regulations will come back into effect.

Prepared by:



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Lakeshore Greenhouse Study Final Report
November 29, 2022

Attachments:

Appendix A – Study Terms of Reference Report
Appendix B – October 22, 2022 Council Motion
Appendix C – Constraints / Opportunities
Appendix D – Stoney Point Water Service Area
Appendix E – Union Water Service Area
Appendix F – Stantec Watershed Study Conclusion
Appendix G – October 6, 2022 OGVG Letter
Appendix H – Greenhouse Multiplier Effects
Appendix I – OMAFRA Lighting Pamphlet
Appendix J – Proposed “No-Build” Area
Appendix K – Wind Turbines
Appendix L – Scientific Paper re Run-off & Greenhouses
Appendix M – Petition

APPENDIX "A" – EXCERPTS FROM LAKESHORE GREENHOUSE STUDY

TERMS OF REFERENCE

LAKESHORE GREENHOUSE STUDY FINAL REPORT

DECEMBER 22, 2021

PREPARED BY:

Storey Samways Planning Ltd.

Chatham, Ontario

www.storeysamways.ca

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LAKESHORE GREENHOUSE STUDY

TERMS OF REFERENCE

1.0 INTRODUCTION

1.1 Overview

In 2019 Council for the Municipality of Lakeshore, reacting to public complaints in other Essex County municipalities where there was substantial greenhouse development, directed Lakeshore Administration to bring back a report regarding a light pollution by-law relating to greenhouses." This led to a series of reports and further direction culminating in an Interim Control By-law (ICBL) being passed prohibiting the development of greenhouses pending receipt of a study outlining the "effects of greenhouse activity, and how best to deal with these effects."

In April 2021, Storey Samways Planning Ltd. (SSPL) was retained by Lakeshore Administration to prepare a Terms of Reference (ToR) for the subject study, combined with a project proposal for its preparation. The ToR are in effect embedded in the study proposal. It should be noted that at the time of writing there are no greenhouses¹ in Lakeshore (as defined in the footnote below), nor are any contemplated to the best of my knowledge. Therefore, any recommendations for mitigating or eliminating negative greenhouse impacts will not have to deal retroactively with existing facilities such as is the case in Leamington and Kingsville.

1.2 Purpose

The purpose of this report is as follows:

- Identify the possible effects / impacts of greenhouse development

¹ For the purposes of this report the definition of the term "greenhouse" is that found in the Lakeshore Zoning By-law for "Greenhouse Farms – shall mean an agricultural use in which the predominant economic activity involves the growing of plant materials in large scale greenhouses, for which the use comprises a minimum of 2.0 hectares, for subsequent replanting or sale."

- Prepare a study process that includes comprehensive stakeholder and public consultation in the preparation of the report with recommendations on ways to mitigate or eliminate undesirable greenhouse effects

1.3 Chronology

- December 10, 2019 – Council resolution regarding greenhouse light pollution
 - November 27, 2020 – at the request of Administration, SSPL submits report regarding the nuisance effects from greenhouse and cannabis facilities
 - December 15, 2020 – Council adopts recommendations of December 7, 2020 T. Ryall report that ICBL preventing greenhouse development be prepared and study undertaken
 - March 9, 2021 – ICBL is passed
 - April 26, 2021 – SSPL and Administration meet to discuss ICBL and study. SSPL was retained to prepare ToR for the study, as well as project proposal, budget and schedule.
 - May 13, 2021 – T. Ryall provides outline for study Terms of Reference (ToR)
- 1.4 Format

Following this Introduction, this report is broken down into the following sections:

- Analysis – based on high-level environmental scan, what are the discernable effects of greenhouses, and what tools exist to deal with these effects.
- Research Approach – what documents, agencies, and individuals will provide the background information necessary to appropriately assist Council in its decision-making

2.0 ANALYSIS

Prior to preparation of this report an environmental scan of the experiences related to cannabis and greenhouse facilities in certain municipalities was

completed. Based on that scan, the most prominent effects, and tools used to mitigate those effects, were identified.

2.1 Greenhouse Effects

Those effects proposed for study are as follows:

- Financial
- Land use compatibility
 - Lighting
 - Odour
 - Girdling (the effect of constraining settlement area growth)
 - Employee housing
- Climate change goals / objectives – utilization of advanced technologies to achieve net-zero emissions

2.2 Municipal Regulatory Tools

The Planning Act has typically provided the tools most often used by municipalities to study and mitigate undesirable greenhouse effects as follows:

- Policy Guidance – use of lower and upper tier official plans
- Regulatory – use of zoning by-laws, including ICBL's and Holding By-laws
- Agreements – use of development agreements, primarily through site plan control
- The study will also look at the potential for other Planning Act tools such as Community Improvement Plans

The study will also review nuisance provisions under the Municipal Act, which have also been used as a regulatory tool.

3.0 PRIMARY RESEARCH APPROACH

Based on the environmental scan, primary research will consist of, but will not necessarily be limited to, the following:

- Review of Planning Documents – Provincial Policy Statement; Official Plans and Zoning By-laws of Lakeshore and other municipalities; County of Essex Regional Energy Plan; special planning studies related to greenhouse-related issues by other municipalities²
- Review of Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and Ontario Professional Planners Institute (OPPI) documents / webinars
- Review of Tribunal Decisions – Ontario Land Tribunal (formerly Ontario Municipal Board / Local Planning Appeal Tribunal); and Normal Farm Practices Protection Board (NFPPB)
- Review of various literature sources
- Interviews with the following:
 - Municipal and government planners experienced with greenhouse development, namely, Chatham-Kent, Kingsville, Norfolk County, County of Essex, Lakeshore, Ministry of Municipal Affairs and Housing, OMAFRA
 - Ratepayer groups, such as exists in Norfolk County
 - Industry representatives from the Ontario Greenhouse Vegetable Growers Industry Association
 - An individual greenhouse grower company

As well, it should be noted that input from the separate stakeholder and public Public Information Centres (PIC's) will form part of the research reported in the final submission.

² It is anticipated the “other municipalities” will be Chatham-Kent, Leamington, Kingsville, and possibly Norfolk County.

APPENDIX "B" – OCTOBER 22, 2022 COUNCIL MOTION

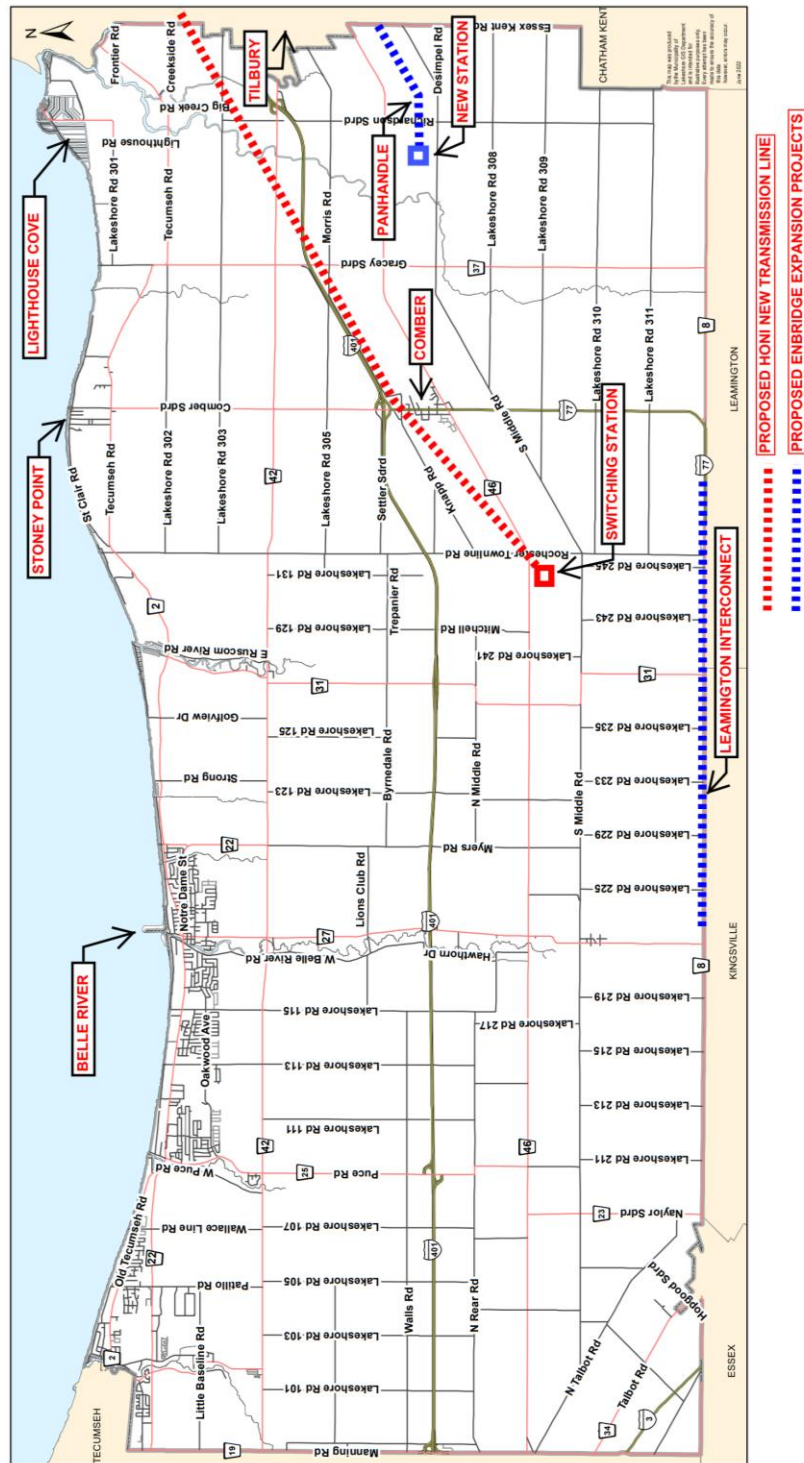
Motion - Majority (Voted), Recorded

1	357-10-2022	Moved:	Councillor McKinlay	
		Seconded:	Councillor Walstedt	
		Result:		Carried

Whereas the Municipality of Lakeshore has received a study related to Greenhouses prepared by Storey Samways Planning Ltd. (SSPL);
 and Whereas the Municipality of Lakeshore has consulted with the residents of Lakeshore;
 and Whereas residents by large majority have expressed opposition to Greenhouses in Lakeshore;
 and Whereas the Municipality of Lakeshore has inadequate infrastructure, related to traffic and water, to accommodate the Greenhouse Industry;
 and Whereas the Municipality of Lakeshore has insufficient resources to accommodate and enforce regulatory compliance required;
 and Whereas the Municipality of Lakeshore lacks the frontline expertise to assess the potential impacts of Greenhouses on the environment;
 and Whereas the Greenhouse Industry contributes to light and air pollution seriously impacting our environmental footprint;
 and Whereas the Municipality of Lakeshore has no mechanism to change the Provincial legislation and reclassify Commercial green housing to industrial use;
 Therefore, be it resolved that the Municipality of Lakeshore opposes large commercial Greenhouses;
 And be it further resolved that the Municipality requests that large commercial greenhouses are reclassified as industrial use;
 And that the resolution be sent to the Premier of Ontario, all Ontario municipalities and the Association of Municipalities of Ontario.

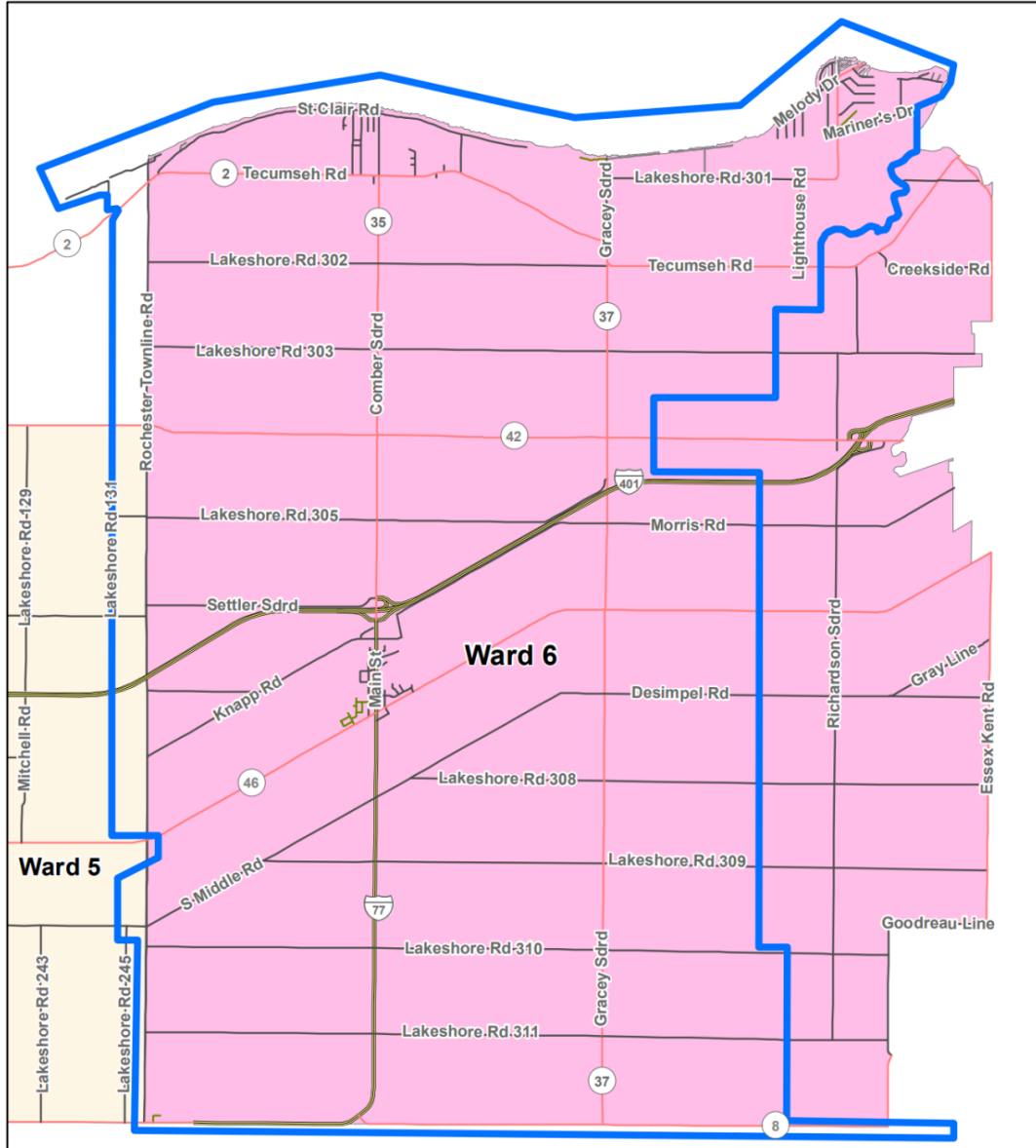
Yes - 6 No - 2

APPENDIX "C" - TRANSMISSION FACILITIES



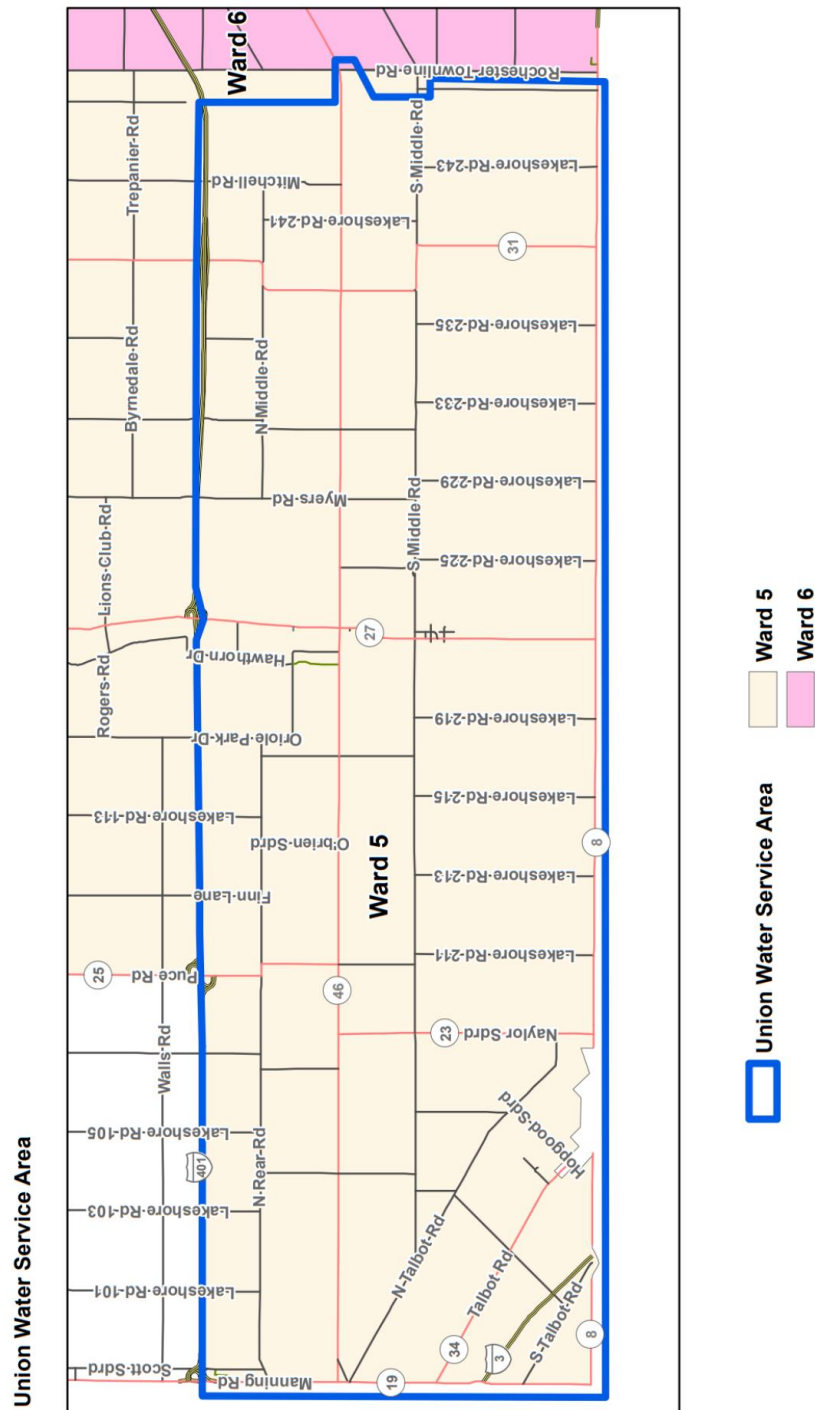
APPENDIX "D" - STONEY POINT WATER SERVICE AREA

Stoney Point Water Service Area



- Stoney Point Water Service Area
- Ward 5
- Ward 6

APPENDIX "E" – UNION WATER SERVICE AREA



APPENDIX "F" – STANTEC WATERSHED STUDY CONCLUSION

LEAMINGTON STORMWATER MASTER DRAINAGE STUDY FOR REID DRAIN, SILVER CREEK AND BIG CREEK WATERSHEDS

Conclusion
July 24, 2020

5.0 CONCLUSION

5.1 SUMMARY

1. Significant greenhouse development is proposed within the Municipality of Leamington. To accommodate the proposed large-scale development and mitigate any adverse impacts to the receiving watercourses/municipal drains, a holistic stormwater management approach is required – one that evaluates the impacts of **increased stormwater runoff volume** at the watershed scale.
2. The study recommends a two-tiered allowable release rate approach. A lower tier release rate is to mitigate long-term erosion potential from increased runoff volume resulting from development. An upper tier release rate is to provide secondary outflow during infrequent storm events, thus reducing storage volume requirements and drawdown times during these infrequent storm events.
3. On-site stormwater management controls should be designed to a **minimum standard** equal to a 1:100 year return period. Section 1.3 explains return periods in relation to level of service and risk.
4. The municipality has projected the following proposed ultimate buildout limits for the purposes of completing this study:
 - o **Big Creek watershed: 25% buildout, equivalent to 1,100 of 4,394 hectares**
 - o **Reid Drain watershed: 75% buildout, equivalent to 735 of 980 hectares**
 - o **Silver Creek watershed: 50% buildout, equivalent to 1,102 of 2204 hectares**
5. Current buildout conditions have been accounted for in the floodline mapping as per the details summarized in Figure 2 of Appendix B, including sites constructed in 2018 under interim design criteria.
6. The model calibration to observed data at the Ruscom gauge was instrumental in adjusting the hydrologic response of the model to mimic actual conditions. Ultimately, the model calibration provided an excellent fit to observed flow rate, volume, shape and timing. The calibration results clearly illustrate that drainage is predominantly driven by interflow or tile drainage with relatively minor contributions from surface runoff under most storm events. The results also demonstrate that flow rates and volumes are significantly impacted by the antecedent moisture conditions (i.e. moisture conditions preceding the storm event).



APPENDIX "G" – OCTOBER 6, 2022 OGVG LETTER

Ontario Greenhouse Vegetable Growers
32 Seneca Road
Leamington ON
N8H 5H7
OGVG.com

October 6, 2022

The Ontario Greenhouse Vegetable Growers (OGVG) represent nearly 200 farmers across the province accounting for more than 3,800 acres of fresh, nutritious, and affordable cucumbers, tomatoes, and peppers. In the Leamington-Kingsville region alone there are almost 2,000 acres of these vegetables, in addition to several hundred acres of strawberries, lettuces, eggplants, melons and other fruit and vegetable crops that are being produced in climate-controlled agriculture. We strive to be community partners, creating jobs and giving back to the Municipalities we operate in. Collectively, we are excited to grow a better future which we can increase career opportunities directly and indirectly, increase regional GDP, and continue to contribute to our communities being strong, proud, and successful. Amongst others, please see below for identified community benefits in a recently conducted study by Lysa Porth, Dean of Business at Lang School of Business, University of Guelph:

- Carbon offsetting opportunities for existing industries, providing environmental and economic benefits, and boosting efforts to contribute to a net-zero economy.
- Attraction of upstream and downstream business that align with the greenhouse sector, including suppliers of inputs and organizations further down the value chain like marketing, transportation, and warehousing.
- Creation of a hub for technology-focused companies focusing on emerging technologies such as AI, data science and robotics with the aim to improve efficiency within the sector.
- Attraction of investment for important infrastructure expansion, providing direct benefits to supporting, surrounding sectors and residents.
- Attraction of research-focused organizations. Attracting public and private investment with potential for international scalability.
- Demand for talent and high-quality professionals, with greenhouses providing relevant and exciting work opportunities incorporating the use of new, cutting-edge technologies spanning robotics and AI.
- Focus area for universities and alignment with new areas of training and education with a focus on STEM and agri-business.
- Growth of indirect sectors, such as housing, restaurants, and tourism, ultimately boosting local commerce.
- Increased demand on the financial sector, including Accounting and Banking services, and development of business risk management programs tailored to the greenhouse sector.
- Meet changing consumer tastes and expectations towards locally grown, healthy and fresh foods while contributing to improved security.

Thank you for taking the opportunity to learn with us today. Good luck in the upcoming elections, as we look forward to connecting, learning, and growing together soon!

APPENDIX "H" – GREENHOUSE MULTIPLIER EFFECTS

PREPARED BY RYAN DONALLY, DIVISION LEADER, ECONOMIC DEVELOPMENT AND MOBILITY, MUNICIPALITY OF LAKESHORE, JULY 2022

Greenhouse Economic Impact

Commentary is provided by the Chief Financial Officer of a greenhouse organization operating in Essex County.

Financial Model as of 2022		
Line Item	Cost Per Acre	Total Cost (50 Acre Greenhouse)
Build Cost: Greenhouse W high pressure sodium Lights	\$ 1,750,000.00	\$ 87,500,000.00
Build Cost: Greenhouse W LED	\$ 2,150,000.00	\$ 107,500,000.00
Revenue	\$ 350,000.00	\$ 17,500,000.00
Operating Cost	\$ 250,000.00	\$ 12,500,000.00

- In 2001 - University of Guelph, Ridgetown College Model identified a build cost of \$400,000 to \$500,000 per acre or a total of \$20,000,000 to \$25,000,000 for a 50 acre greenhouse. This number was consistent with a 2001 report from Chatham Kent.
- Assuming high pressure sodium lights were used in 2001, the build cost for a 2022 Greenhouse with sodium lights has increased 3.5 times.

Total Capital Cost

- Assuming 3500 acres in Leamington and Kingsville (Invest WindsorEssex Source) and assuming an average build cost of \$1,250,000 (skewed to more new greenhouses than old) the total capital cost over the lifespan of the greenhouse industry is **\$4,375,000,000**

Revenue and Operating Cost 2022	Per Acre	Total (50 acre)
Revenue	\$ 350,000.00	\$ 17,500,000.00
Operating Cost	\$ 250,000.00	\$ 12,500,000.00

- The 2001 – University of Guelph report identified an operational cost of approximately \$160,000 per acre.
- The increase of operational cost has increased 1.56 times.

Labour

The 2001 – University of Guelph & 2001 Chatham-Kent report

- Identified 2.5 to 3 employees per acre.

LAKESHORE GREENHOUSE STUDY
November 29, 2022

- The assumption is based of 2.5 labourers or pickers per acre with 0.5 management.

Discussion with CFO - 2022

- Approximately 150 to 175 employees per 50 acre greenhouse (depending on crop) which equates to 3 to 3.5 employees per acre.
- 83% are labourers/ pickers which are traditionally Temporary Foreign Workers (125 of 150 employees or 150 pickers if 175 total employees).
- 20-30 management/non-labourer staff depending on the ability to in-house or outsource support roles like marketing, distribution, human resources.

See attached Excel Document for Detail

Staffing		
Job Title	NOC Title	Job Number
Pickers/ Labourers	Nursery and greenhouse workers	150
General Manager	Managers in Horticulture	1
Growers	Managers in Agriculture	2
Assistant Growers	Farm Supervisors	4
Labour Manager	Human Resources Manager	2
Marketing	Sales, Marketing and Advertising manager	2
Bookkeepers	Accounting Technicians and Bookkeepers	2
Accountants	Financial Auditors and Accountants	2
Pest Management	Pest Controllers and fumigators	2
Purchasing Manager	Purchasing Manager	2
Shipping and Receiving Manager	Supervisors, supply chain, tracking and scheduling coordinator	1
Quality Assurance mgr	Supervisors, food and beverage processing	2
Health and Safety mgr	Inspector in public and environmental health and occupational health and safety	1

Salary Analysis

– Source EMSI/ Lightcast Economic Modelling 2021

https://a.economicmodeling.com/analyst/?t=3r52b#h=h0vzb&page=occupation_table&vertical=standard&nation=ca

- Total employee count: 173

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November 29, 2022

- Total Salaries: \$6,601,837.59
- Average salary per employee: \$38,160.91
- Average salary per non-labourer employee: \$59,880.07
- Count of non-labourers = 23
- Count of labourers = 150
- Percentage of non-labourers = 13.3%

Regional Multipliers- FARMS (Windsor CMA and Leamington CMA – 2021)

- Source EMSI/Lightcast Modelling 2019 Year
https://a.economicmodeling.com/analyst/?t=3r52b#h=h0yMR&page=model_multipliers&vertical=standard&nation=ca

2019 Input-Output Year:

Import Purchases vs. Export Purchases

Essex County	All farms (including field)
Total purchases	\$ 946,878,184.83
Total in-region purchases	\$ 179,043,090.57
Total import purchases	\$ 767,835,094.26

Kingsville and Leamington	All farms (including field)	Per Acre (see assumption below*)
Total purchases	\$ 800,708,617.00	\$ 228,773.89
Total in-region purchases	\$ 22,466,240.00	\$ 6,418.93
Total import purchases	\$ 778,242,377.00	\$ 222,354.96

* Assumption: There are approximately 3500 acres of greenhouse in Kingsville and Leamington (source is Invest WindsorEssex). For purposes of understanding purchases, we assume that all farms in the Leamington and Kingsville area are greenhouses.

**EMSI Modelling – Data may be slightly askew as this is modelling software (the total import purchases for Leamington and Kingsville is higher than all of Essex County).

Economic Multipliers

The 2001 – University of Guelph Report & CK Report

- Economic multiplier of 5x to 6x.
- Approximately 1000 acres of greenhouse in 2001 in Leamington and Kingsville
- Assumed \$160,000 operating expense per acre times 1000 acres is \$160,000,000 of total operating expense in the area. With a 6X multiple, it was assumed to have approximately \$960,000,000 impact on the local economy.

2022 Analysis

Multipliers based of EMSI / Lightcast Regional Multipliers of Windsor and Leamington CMA.

It contains data from Emsi's Input-Output model. It is based on data from StatCan's National Symmetric Input-Output table, National Household Survey commuting flows, Canadian Business Patterns, and several Emsi in-house data sets.

LAKESHORE GREENHOUSE STUDY
November 29, 2022

https://a.economicmodeling.com/analyst/?t=3r52b#h=h105v&page=model_multipliers&vertical=standards&nation=ca

Industry	Farms	Totals per acre	50 Acre Farm	3500 Acres
Direct Sales	0.2038	\$ 71,330.00	\$ 3,566,500.00	\$ 249,655,000.00
Indirect Sales	0.0527	\$ 18,445.00	\$ 922,250.00	\$ 64,557,500.00
Induced Sales	0.1761	\$ 61,635.00	\$ 3,081,750.00	\$ 215,722,500.00
Total Sales	1.4327	\$ 501,445.00	\$ 25,072,250.00	\$ 1,755,057,500.00
Direct Wages	0.3588	\$ 47,374.79	\$ 2,368,739.33	\$ 165,811,752.91
Indirect Wages	0.1303	\$ 17,204.39	\$ 860,219.44	\$ 60,215,360.66
Induced Wages	0.6641	\$ 87,685.61	\$ 4,384,280.34	\$ 306,899,624.05
Wages To Sales	0.0482	\$ 6,364.17	\$ 318,208.57	\$ 22,274,600.03
Total Wages	2.1532	\$ 284,301.53	\$ 14,215,076.70	\$ 995,055,368.92
Direct Jobs	0.3104	1.073984	\$ 53.70	3758.94
Indirect Jobs	0.1072	0.370912	\$ 18.55	1298.19
Induced Jobs	0.6586	2.278756	\$ 113.94	7975.65
Total Jobs	2.0763	7.183998	\$ 359.20	25143.99

Additional Information as Discussed on July 20th

Farming Industry	Multiplier Number	Totals per acre	50 Acre Farm	3500 Acres
Initial	1.0001	\$ 350,035.00	\$ 17,501,750.00	\$ 1,225,122,500.00
Direct Sales	0.2038	\$ 71,330.00	\$ 3,566,500.00	\$ 249,655,000.00
Indirect Sales	0.0527	\$ 18,445.00	\$ 922,250.00	\$ 64,557,500.00
Induced Sales	0.1761	\$ 61,635.00	\$ 3,081,750.00	\$ 215,722,500.00
Total Sales	1.4327	\$ 501,445.00	\$ 25,072,250.00	\$ 1,755,057,500.00
Initial	1	\$ 132,036.75	\$ 6,601,837.59	\$ 462,128,631.30
Direct Wages	0.3588	\$ 47,374.79	\$ 2,368,739.33	\$ 165,811,752.91
Indirect Wages	0.1303	\$ 17,204.39	\$ 860,219.44	\$ 60,215,360.66
Induced Wages	0.6641	\$ 87,685.61	\$ 4,384,280.34	\$ 306,899,624.05
Wages To Sales	0.0482	\$ 6,364.17	\$ 318,208.57	\$ 22,274,600.03
Total Wages	2.1532	\$ 284,301.53	\$ 14,215,076.70	\$ 995,055,368.92
Initial	1.0001	3.460346	173.0173	12111.211
Direct Jobs	0.3104	1.073984	53.6992	3758.94
Indirect Jobs	0.1072	0.370912	18.5456	1298.19
Induced Jobs	0.6586	2.278756	113.9378	7975.65
Total Jobs	2.0763	7.183998	359.20	25143.99

Definitions

Initial - The initial sales, wages or jobs created.

Direct - The effect of new input purchases by the initially changed industries. This is the first round of impacts (see “Indirect”). This change is due to inter-industry effects.

Indirect - The subsequent ripple effect in further supply chains resulting from the direct change. In more awkward terms, this shows the sales change in the supply chains of the supply chain, as a result of the direct change. This is the sum of the second and subsequent rounds of impact (see “Direct”). This change is due to inter-industry effects.

Induced - This change is due to the impact of the new wages, investment, and government created by the initial, direct, and indirect changes. Induced effects enter the economy as employees spend their paychecks in the region, businesses invest to grow their operations, and government spends more to support the changes.

Windsor and Leamington CMA – Regional Multiplier Comparators

NAICS	Industry	Total Sales	Total Jobs	Total Wages
2361	Residential building construction	1.7944	3.0977	2.9872
2362	Non-residential building construction	1.9166	2.2254	2.1145
1110	Farms	1.4327	2.0763	2.1532
3361	Motor vehicle manufacturing	1.2125	1.9247	1.5936
4841	General freight trucking	1.6309	1.7387	1.6490
5322	Consumer goods rental	1.7161	1.6256	1.6288

APPENDIX "I" – OMAFRA LIGHTING PAMPHLET



Ontario Ministry of Agriculture, Food and Rural Affairs

Managing Nighttime Greenhouse Light Emissions

An increase in the use of supplemental lighting in greenhouses has been accompanied with an increase in the amount of light emitted from greenhouses at night during fall and winter months. Without proper management strategies, light emitted from greenhouses during nighttime hours can potentially be disruptive to neighbouring residents. As a result, the objective of this document is to outline the latest research in greenhouse light management for producers and to provide information on managing nuisance complaints should they arise.

Highlights of Greenhouse Light Management Research:

- While many studies have investigated the effects that different lighting strategies have on plant production, there has been little examination of light emissions from greenhouses.
- The amount of light emitted from greenhouses using supplemental light is dependent on many factors including light abatement curtain use, crop stage, and light intensity (Snow et al.; 2022a, 2021a, 2021b).
- Sky brightness levels near greenhouses using supplementary lighting can be affected by light levels emitted from other sources in the region (e.g., infrastructure, industry, residences and businesses). Cloud conditions, air quality and moon phase also impact sky brightness (Snow et al.; 2022a, 2021a, 2021b).
- Research to determine optimal light management strategies for greenhouse production is ongoing, with the goal of developing strategies that create growing environments to support plant health, yield, energy efficiency and compatibility with neighbouring land uses.

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1-877-424-1300

Greenhouse light emissions

The amount of light emitted from greenhouses using supplemental lighting at night depends on light intensity, closure of light abatement curtains and amount of vegetation.

Light intensity of the fixtures installed in the greenhouse

In general, crops that produce fruits like high wire vegetables or large flowers such as cannabis require more light than potted ornamental plants or lettuce (Faust, 2021). The use of higher intensity supplemental lighting in greenhouses is associated with higher light emissions when light abatement curtains are not being used (Snow et al.; 2022a, 2021a).

Closure of light abatement curtains over the crop and on side and end walls

There are many models of light abatement curtains on the market that are made of different materials to suit the needs of greenhouse producers for managing the greenhouse environment for the crop (see Table 1 in the Appendix). These curtains reduce the amount of light emitted from greenhouses by reflecting the light back into the greenhouses. Current ceiling light abatement curtains allow less than 1% light transmission and wall light abatement curtains allow less than 2% light transmission when fully closed. This allows for greater use efficiency of the supplemental lighting since most of the light is contained inside the greenhouse to be used by the crop.

Light emitted from the sides and ceiling of greenhouses using supplemental lighting at night may impact neighbouring land uses. These light emissions can be minimized by using ceiling, side and end wall light abatement curtains. As ceiling light abatement curtains are opened to different gapping degrees (10%, 20% gapping, etc.), there is an increase in the amount of light emitted that is somewhat proportional with the gapping (Snow et al., 2021b).

Furthermore, light emitted from the top of greenhouses using supplemental lighting at night may be observed further from the source by artificially illuminating the night sky. These emissions can be reduced by using light abatement curtains over the crop. There may not be much change in sky brightness when fully closed light abatement curtains are opened to a 10% gap, but as light abatement curtains are

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fully opened there may be a significant increase in sky brightness near the greenhouse (Snow et al., 2022a).

Amount of vegetation in the greenhouse

More light is emitted from walkways and areas with less plant volume than areas in full production. This is most likely due to more light being reflected by surfaces than plants (Snow et al., 2022a).

Energy efficiency considerations

Curtains designed for light abatement (keeping supplemental light in the greenhouse) or blackout (keeping sunlight out of the greenhouse; typically used in cannabis or ornamental production) offer potential energy savings especially when used in combination with energy curtains as a double layer over the crop (Hanifin, 2022). The use of light management curtains can impact the climate in the greenhouse, which in turn can negatively impact plant growth and yield. Therefore, it is important to research production practices and technologies that can address potential humidity and temperature concerns.

Strategies to maintain a consistent environment in greenhouses with deployed light abatement curtains are being researched (Nauta et al.; 2022). Using new technology, such as air-mix fans, may help growers maintain a consistent environment under light management conditions. Air-mix fans blend air from above light abatement curtains with air from below the curtains when curtains are fully closed. The cooler air above the curtains is pulled below the curtains and mixed with the warmer air to cool it down before being blown into the greenhouse. These fans are typically installed below the curtains with a duct leading through the curtain to the space above the curtains (see Table 2 in the Appendix). This technology may assist in maintaining a constant climate in a greenhouse where light abatement curtains are closed.

Dehumidification technologies may also provide additional climate control in the greenhouse and energy savings in the fall and winter months (Han et al.; 2021) or when outside ventilation is limited by curtain deployment. However, this needs to be tested in greenhouses with light abatement curtains.

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Why is Supplemental Lighting Necessary

Shorter days in the autumn and winter seasons and low light levels during cloudy days in the spring and summer seasons make the use of supplemental lighting necessary for the production of high-quality greenhouse vegetables, fruits, ornamentals, and other crops year-round in Ontario. Greenhouse producers may use supplemental lighting throughout the year for a variety of reasons based on the crops they produce, such as:

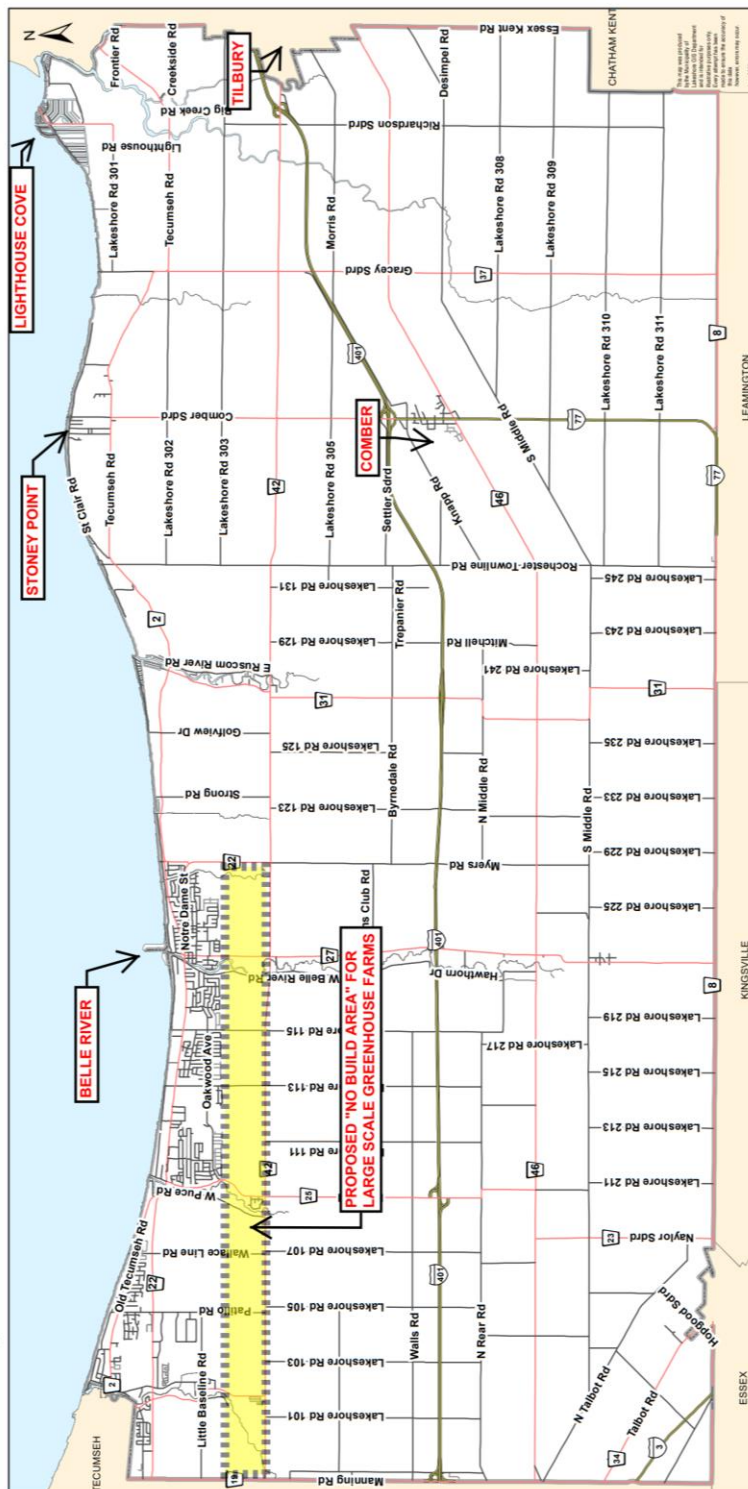
1. Supplemental light may be used to increase the amount and/or duration of light a plant receives during a day to ensure optimal growth. This can be achieved through **day length extension** by using lights before sunrise or after sunset. Lights may also be used during the day to provide increased light intensity on cloudy days or during sunrise and sunset.
2. In ornamental and cannabis plants, supplemental light may be used to **control flowering**. Night interruption may be used to control flowering time in ornamental crops by providing a brief period of light during the dark/night period. Certain species of cannabis need a fixed light period to promote the transition from vegetative growth to flowering.

There are two common types of supplemental lighting used in greenhouse production. **High pressure sodium (HPS)** lights have traditionally been more popular, but the transition to more energy efficient **light-emitting diodes (LED)** is ongoing. LED fixtures also allow growers to use different spectrums of light to optimize how the plant develops, and the lower amount of heat generated by LEDs allows them to be placed closer to the crop, and where appropriate, within the crop canopy.

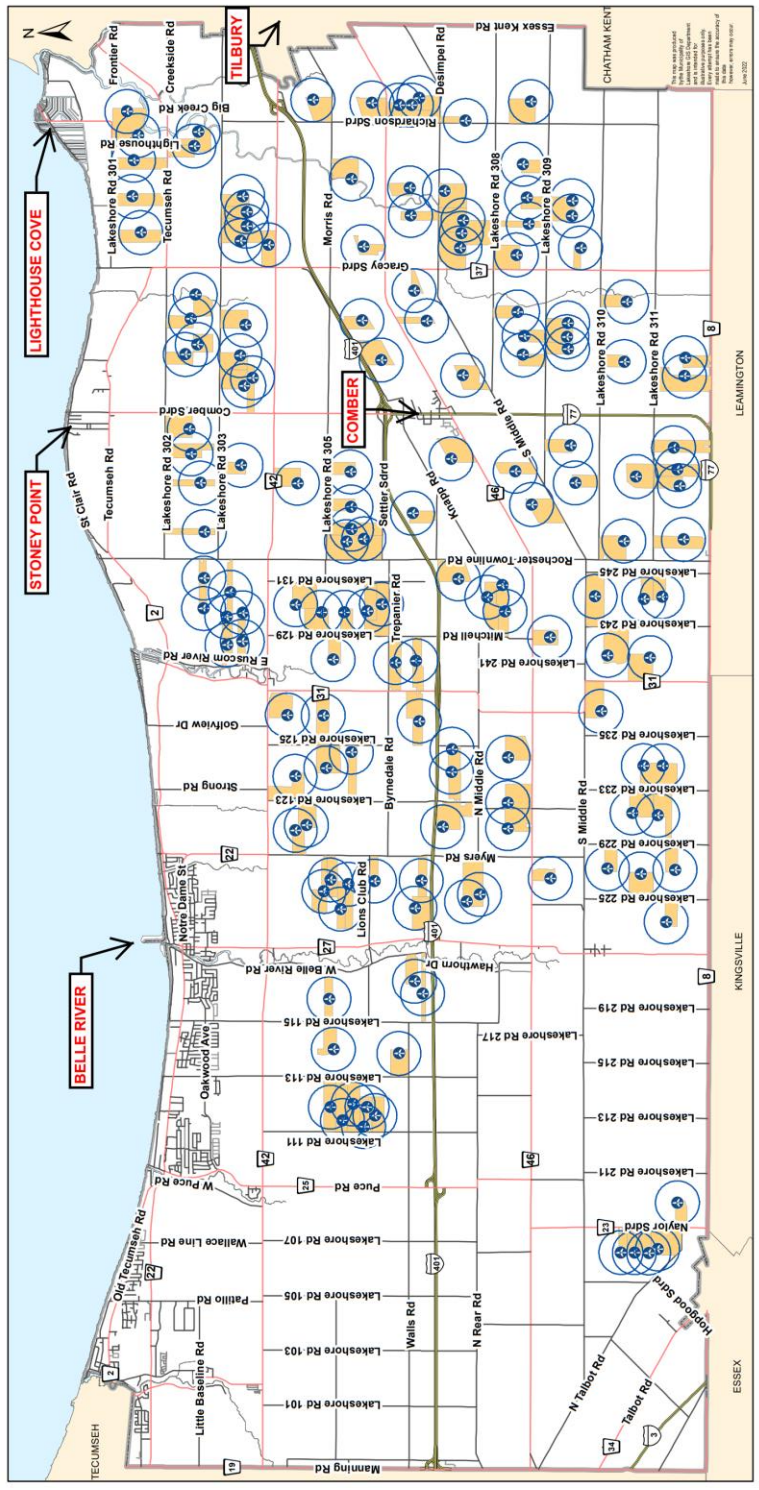
Supplemental lighting is most commonly delivered from above the crop with fixtures hung from greenhouse trusses. **Overhead** supplemental lighting is typically used to extend the day length in the fall and winter months, but it can be used year-round to increase the amount of light a crop receives. **Intracanopy** lights, which are placed within the canopy of vine vegetable crops like tomatoes, peppers, and cucumbers can also be used year-round to improve light delivery to shaded areas of the canopy where the plant develops fruit.

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APPENDIX "J" – PROPOSED "NO BUILD" AREA



APPENDIX "K" – WIND TURBINE LOCATIONS



APPENDIX "L" – SCIENTIFIC PAPER RE RUN-OFF & GREENHOUSES

Science of the Total Environment 633 (2018) 433–440



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Increased nutrient concentrations in Lake Erie tributaries influenced by greenhouse agriculture

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HIGHLIGHTS

- Greenhouse production of vegetables is a globally important industry.
- Nutrients and trace metals quantified in greenhouse and non-greenhouse rivers.
- Greenhouse river concentrations were 4× to 28× higher than non-greenhouse rivers.
- Concentrations in greenhouse rivers appeared to decrease over time.
- Increased precipitation likely diluted greenhouse influenced river concentrations.

GRAPHICAL ABSTRACT

Influence of agriculture type within watershed on stream chemistry.

Influence of agriculture type within watershed on stream chemistry



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ABSTRACT

Greenhouse production of vegetables is a growing global trade. While greenhouses are typically captured under regulations aimed at farmland, they may also function as a point source of effluent. In this study, the cumulative impacts greenhouse effluents have on riverine macronutrient and trace metal concentrations were examined. Water samples were collected Bi-weekly for five years from 14 rivers in agriculturally dominated watersheds in southwestern Ontario. Nine of the watersheds contained greenhouses with their boundaries. Greenhouse influenced rivers had significantly higher concentrations of macronutrients (nitrogen, phosphorus, and potassium) and trace metals (copper, molybdenum, and zinc). Concentrations within greenhouse influenced rivers appeared to decrease over the 5-year study while concentrations within non-greenhouse influenced river remained constant. The different temporal pattern between river types was attributed to increased precipitation during the study period. Increases in precipitation diluted concentrations in greenhouse influenced rivers; however, non-influenced river runoff proportionally increased nutrient mobility and flow, stabilizing the observed concentrations of non-point sources. Understanding the dynamic nature of environmental releases of point and non-point sources of nutrients and trace metals in mixed agricultural systems using riverine water chemistry is complicated by changes in climatic conditions, highlighting the need for long-term monitoring of nutrients, river flows and weather data in assessing these agricultural sectors.

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APPENDIX "M" – PETITION



Petition

The Municipality of Lakeshore received the following petition on September 29, 2022:

“We, the undersigned, do not want greenhouses in the Municipality of Lakeshore due to the following serious issues:

- **Light & Air Pollution**
- **Excessive Odours**
- **Restricted Water Supply**
- **Shortage of Sewer Capacity**
- **Environmental Impact**
- **Economic & social shifts in Dynamics**
- **Fair zoning taxation on greenhouse owners... a greenhouse is not a farm**

Until all these issues are legally resolved, we do not want greenhouses in the Municipality of Lakeshore.”

The petition included approximately 1,656 electronic and original signatures.

Note: as this was partially an online petition (through the website change.org) Administration is unable to verify the authenticity of the signatures.