



you'll be surprised!

Welcome

Bright's Grove Intake Replacement
Municipal Environmental Assessment

Public Information Centre
April 4th, 2023

Welcome!



Bright's Grove Water Treatment Plant Intake Replacement

Municipal Class Environmental Assessment Study

1

Please Sign in

Meeting is a “Drop-in” format.

2

Review Display Materials

Our representatives will be pleased to discuss the study with you, or any questions or concerns that you may have.

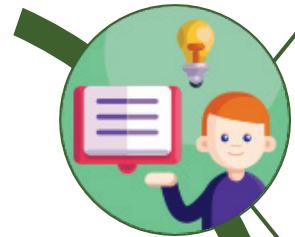
3

Complete a Comment Sheet

Drop off your completed Comment Sheet in the Box tonight or return it to the contact people shown on the Comment Sheet by **April 30, 2023.**

Why are we here?

Your feedback is important to this Class Environmental Assessment Study!



Please review the Public Information Centre presentation to learn about the process, the activities completed to date, and the **Preliminary Preferred Solution being recommended.**



Your opinion is important to us! Members of the project team are available to answer questions via email or telephone.

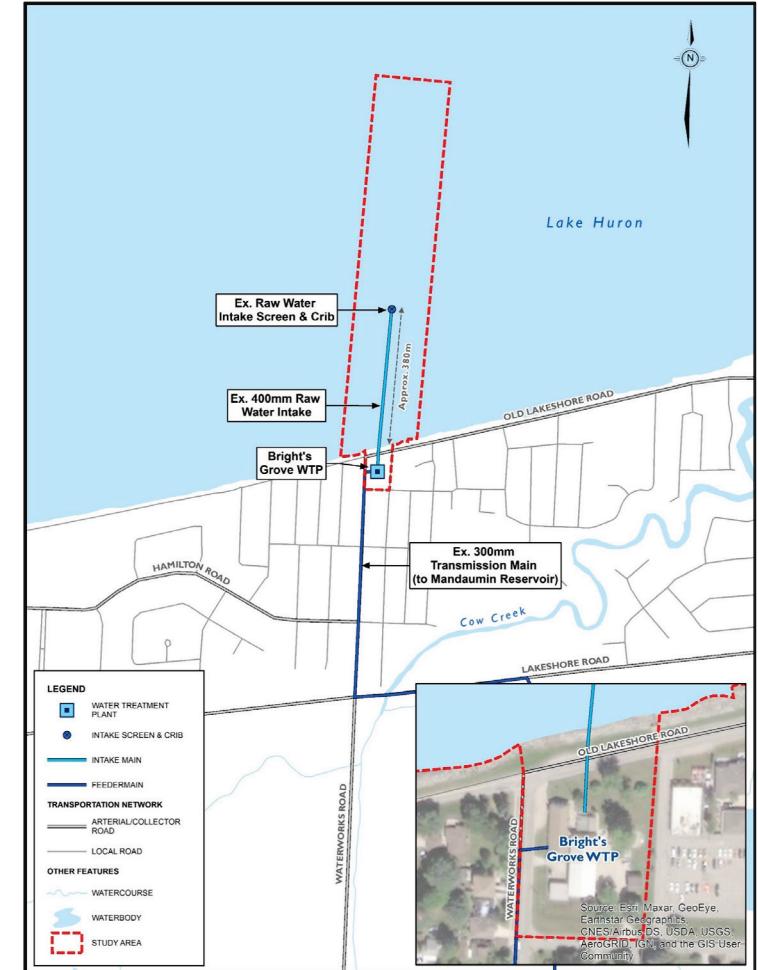


Please complete a **Comment Sheet** after reviewing the materials.

Project Background



- The Bright's Grove Water Treatment Plant located at 2701 Old Lakeshore Road provides high-quality drinking water to the Petrolia Drinking Water System. The Petrolia Drinking Water System provides service to residents and businesses in the Town of Petrolia, as well as in the Village of Oil Springs and the Townships of Enniskillen and Dawn-Euphemia.
- The raw water quality at the existing intake location has historically been good, with periods of high turbidity experienced during storm events.
- Due to the relatively shallow depth of the intake, the intake has experienced blockage of the intake due to frazil ice.



Project Background (continued)



- Existing intake pipe:
 - Installed in 1944 to replace the original intake pipeline constructed in 1896.
 - Extends approximately 400m into Lake Huron.
 - 400mm diameter cast iron pipe.
 - Equipped with an intake screen to allow water flow into the pipe and crib structure to protect the screen.
 - Recently retrofitted with zebra mussel and frazil ice control systems.
- **Intake pipe is at the end of its useful life.** Its current condition results in hydraulic capacity limitations, maintenance concerns resulting in risk of failure.
- Expected capital costs are \$16.2Million.



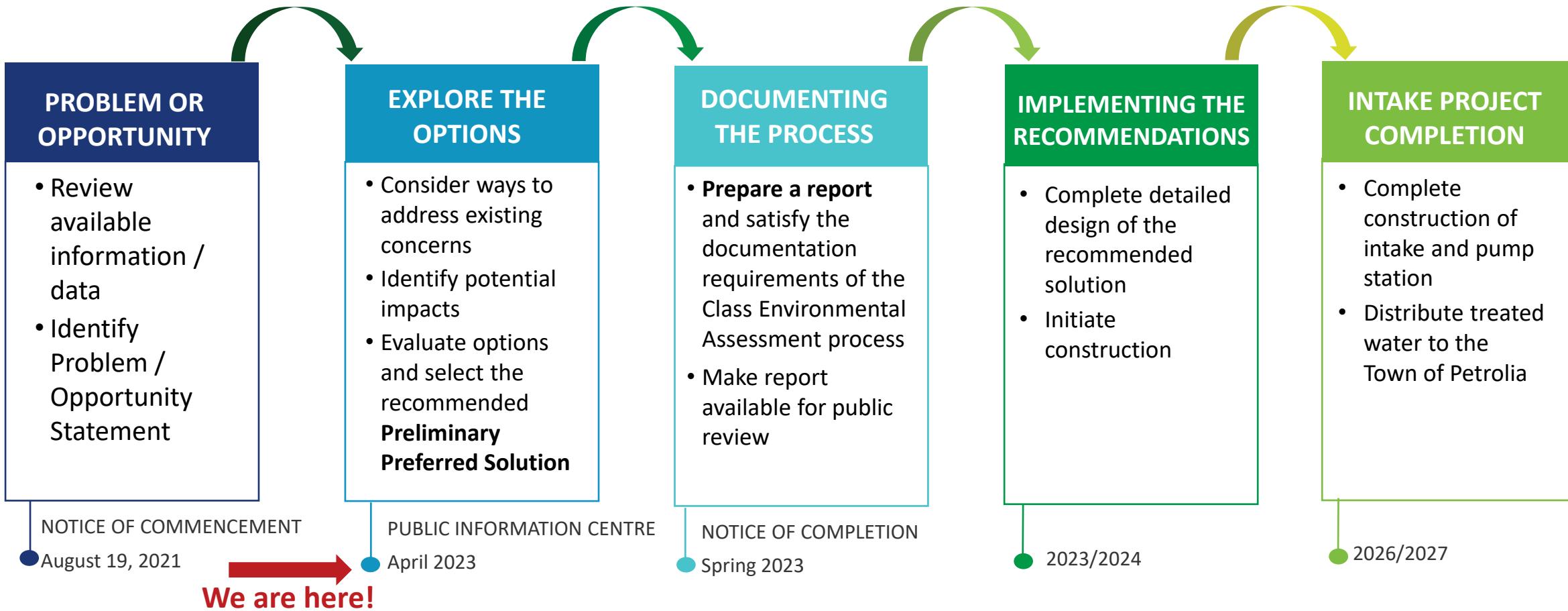
Photos taken of intake screen, pipe cut-out section, zebra mussel infestation, pipeline crack near the shoreline.

Purpose of the Study



- To identify a preferred water supply source to ensure a secure and reliable source of raw water to the Petrolia Water Treatment Plant and to address current maintenance concerns with the existing intake pipe; and,
- To recommend a preferred solution that ensures a safe and reliable source of water for the Petrolia Drinking Water System, while minimizing impacts on the natural and socio-cultural environments, and with regards to technical and financial implications.

Municipal Class Environmental Assessment Study - Process and Timeline

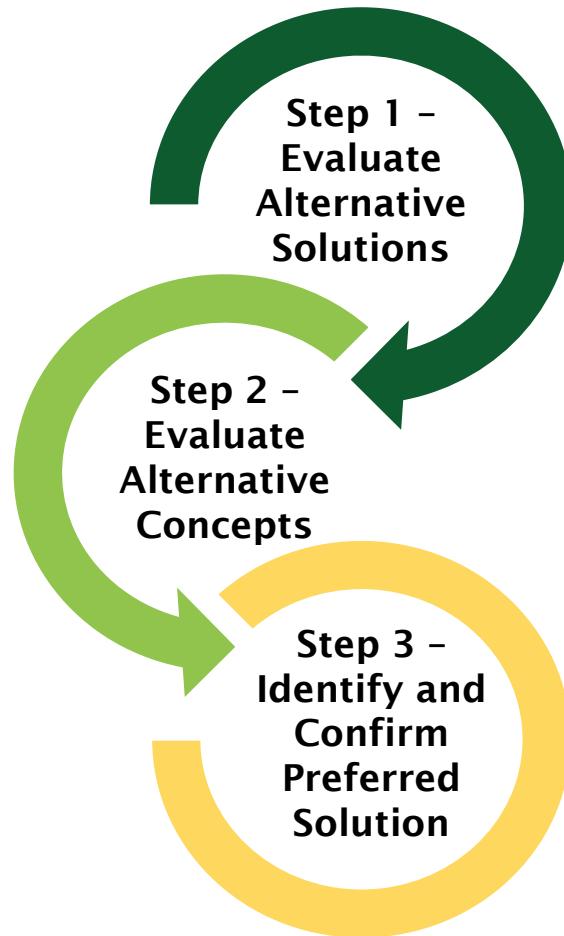


Environmental Assessment Phase 1– Problem/Opportunity Statement



A preferred raw water supply solution is required to ensure a secure and reliable source of raw water for the Town of Petrolia Drinking Water System to address current concerns associated with the capacity and condition of the existing intake

Selecting the Preferred Solution – The Process



- Alternatives were screened based on ability to meet:
 - Capacity requirements
 - Water quality standards, objectives and guidelines for the plant, and
 - Maximize existing infrastructure, compatibility with existing processes, and constructability simplicity
- **Replacing the Existing Intake was selected as the Preliminary Preferred Alternative Solution.**
- **Alternative concepts** for replacing the existing intake were developed.
- Options were assessed based on evaluation criteria, shown in next panel.
- The option with the overall best score is being **recommended as the Preliminary Preferred Water Supply Solution.**
- Feedback from the public and stakeholders is being requested.
- The preferred solution will be confirmed with input from the public and review agencies.

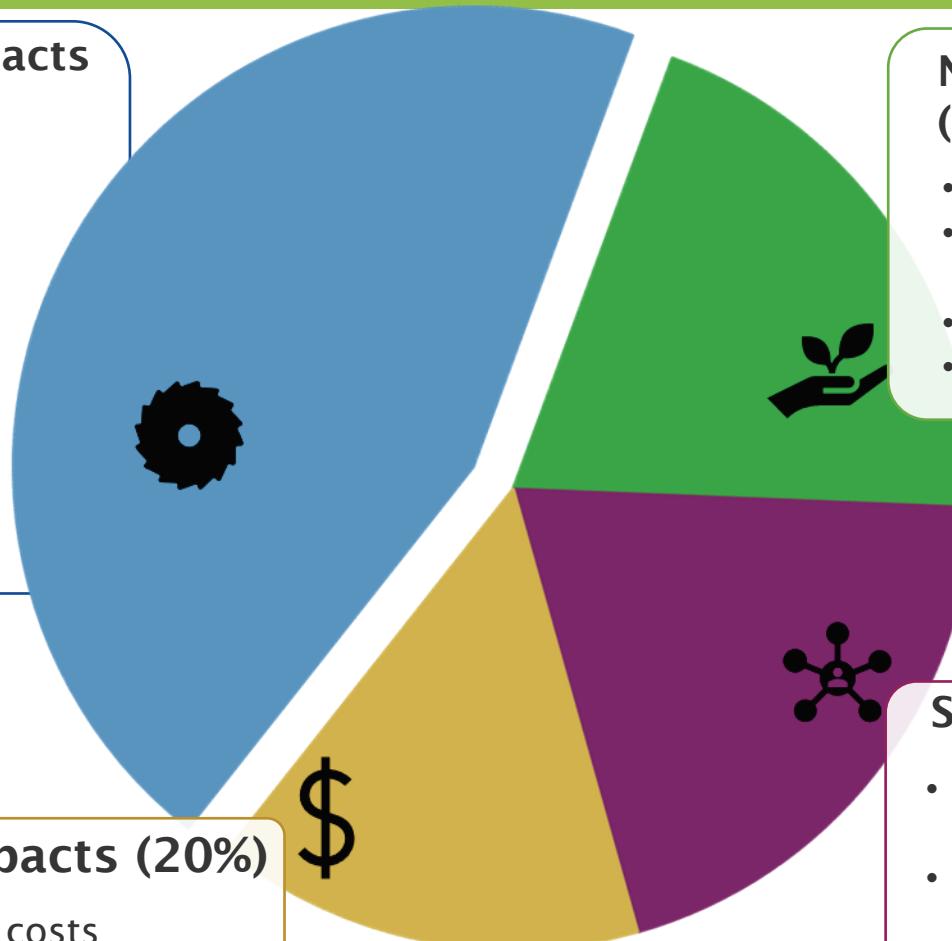
Evaluating the Alternative Concepts - Evaluation Criteria

Technical and Operational Impacts (45%)

- Raw water quality
- Vulnerability to contaminants
- Constructability issues
- Operation and maintenance complexity
- Construction duration, staging opportunities
- Approvals
- Land acquisition

Financial Impacts (20%)

- Construction costs



Natural Environmental Impacts (20%)

- Natural habitat, terrestrial, aquatic, etc.
- Archaeological and cultural heritage features
- Vulnerability to climate changes
- Source water protection

Socio-Cultural Impacts (15%)

- Public and staff health and safety concerns
- Impacts / disruption to residents and local users

Alternative Solutions Considered and Screening Results



Alternative Solutions	Screening Observations	Recommendation
1 - DO NOTHING	<ul style="list-style-type: none">No improvements to the existing intake pipe.This alternative does not address the concerns identified with the intake pipe.	Not recommended
2 - LIMIT COMMUNITY GROWTH	<ul style="list-style-type: none">No additional growth in the serviced area.This alternative does not address the concerns identified with the intake pipe.	Not recommended
3 - IMPLEMENT WATER CONSERVATION MEASURES	<ul style="list-style-type: none">This alternative does not address the concerns identified with the existing intake pipe.	Not recommended
4 - OBTAIN RAW WATER FROM ANOTHER SOURCE	<ul style="list-style-type: none">Extend raw water supply from a neighboring municipality into Petrolia.Major capital expenditure with new work and upgrades.This alternative does not address the concerns identified with the intake pipe.	Not recommended
5 - REFURBISH EXISTING INTAKE	<ul style="list-style-type: none">Physical measures would be implemented to try to restore existing intake pipe.Questionable integrity of retrofitted pipe. Challenges to allow continuous operation of existing plant during construction.	Not recommended
6 - REPLACE EXISTING INTAKE	<ul style="list-style-type: none">New intake pipe and intake crib would be installed.This alternative addresses concerns identified with the intake pipe.	Recommended for further consideration

Existing Conditions – Cultural Heritage



Built and Cultural Heritage Resources

- The existing Petrolia Water Treatment Plant (2701 Old Lakeshore Road) was identified as a building with heritage value
- The identified heritage value of the property is confined to the original 1896 pumping station located at the corner of property
- The scope of the proposed work poses no direct impact of the identified heritage value



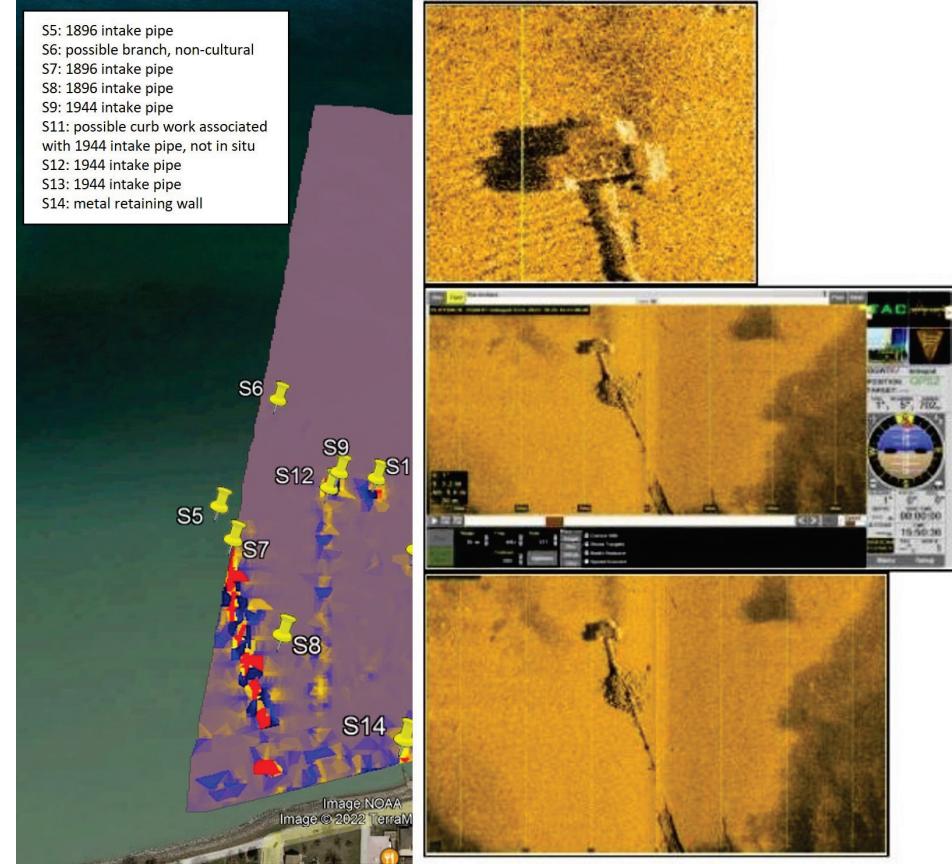
Updated colorized historic image of 'Petrolia Water Works' - Cultural Heritage Screening Report - PHC Group (2022) – Town of Petrolia

Existing Conditions - Archaeological Study



Archaeological Marine Findings

- Through snorkeling investigations 30m off the coast the existing intake pipes were inspected
- From the investigations it was found that an intake pipe from 1896 still exists and the new intake will not impact it
- The 1944 intake pipe is considered “modern” archaeological artifact and will provide no significant archaeological information



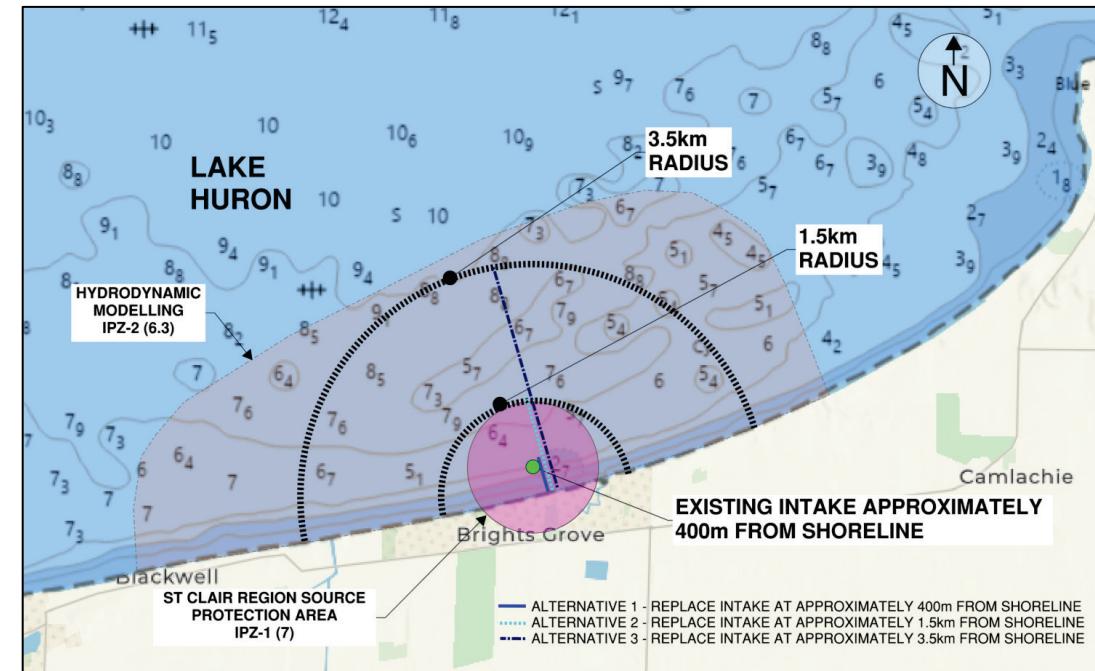
Existing Intake Pipes - Marine Archaeological Report - ARA Group. (2022).
Town of Petrolia.

Alternative Intake Locations



- Preliminary Preferred Water Supply Solution – Replace Existing Intake
- Three (3) alternative locations for the intake replacement

Alternative	Description
1	Similar location as existing, approximate length of 0.4km, depth over intake 3.0m at historic low lake level
2	Extend to 1.5km length and increase depth over intake to 7.0m at historic low lake level
3	Extend to 3.5km length and increase depth over intake to 8.0m at historic low lake level



Potential Intake Lengths and Depths

Assessment of Alternative – Intake Locations



Alternative Locations	Advantages	Disadvantages
Length - 0.4km, depth 3.0m	<ul style="list-style-type: none">Historically good quality raw waterNo significant impact to Source Protection PlanLowest Capital Cost	<ul style="list-style-type: none">Minimum cover over proposed intake, highest risk of frazil ice blockage and risk of surface ice impacts to intake screen.
Length - 1.5km, depth 7.0m	<ul style="list-style-type: none">Additional depth of water over intake will reduce risk of frazil ice blockagePotential reduction in high turbidity in raw water due to storm eventsIncreased depth will reduce risk of surface ice impacts to intake screen and crib	<ul style="list-style-type: none">Will require an update to Source Protection Plan which will delay implementation and may impact proposed developments in SarniaGreater impact to Navigable WatersHigher Capital Cost for intake replacement
Length - 3.5km, depth 8.0m	<ul style="list-style-type: none">Same as above	<ul style="list-style-type: none">Will require an update to Source Protection Plan which will delay implementation and may impact proposed developments in SarniaGreatest impact to Navigable WatersHighest Capital Cost for intake replacement

Evaluation of Alternative Design Concepts for Intake

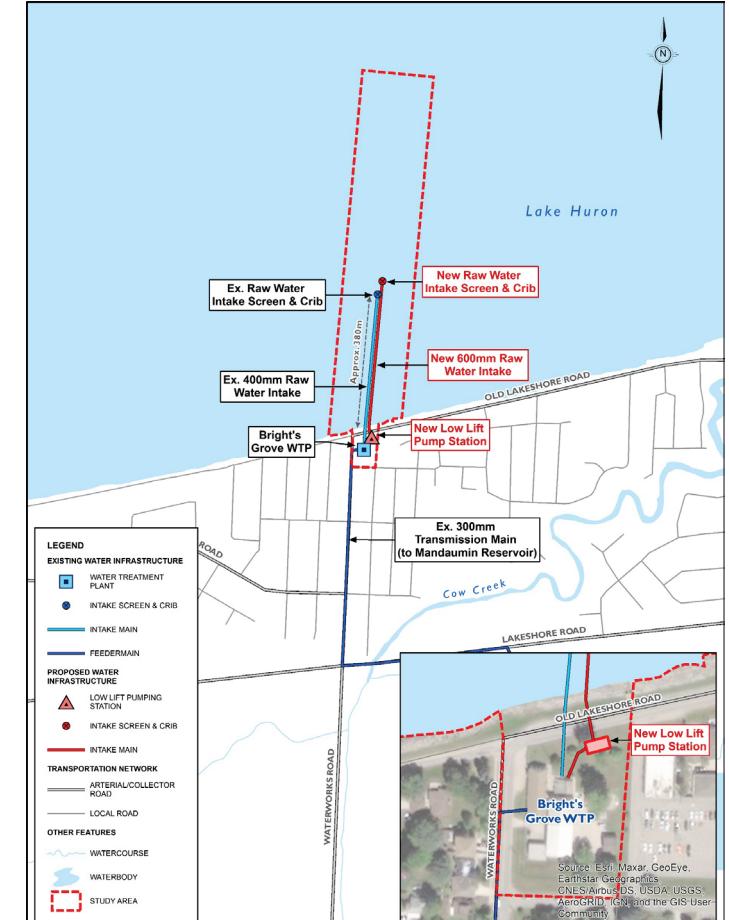


No.	Alternative Design	Advantages	Disadvantages
1	Retrofit as Closed System using existing low-lift pumping station	<ul style="list-style-type: none">Utilizes existing infrastructure and minimizes the need for major retrofitting of existing low-lift pumping stationEasy to adapt to a future pre-treatment addition	<ul style="list-style-type: none">Challenges to maintain continuous operation of water treatment plant during constructionInflexible for future upgradesComplex excavation support system necessary to protect existing Heritage structure
2	Retrofit as Open System using existing low-lift pump station	<ul style="list-style-type: none">Similar to Option 1; however, new submersible pumps required to replace existing low-lift pumps	<ul style="list-style-type: none">Challenges to maintain continuous operation of water treatment plant during constructionComplex excavation support system necessary to protect existing Heritage structure
3	Closed System with new low-lift pumping station	<ul style="list-style-type: none">Minimizes need for water treatment plant shut-downsFlexibility for future improvements	<ul style="list-style-type: none">Larger footprint for low-lift pump station to accommodate below-grade pump room.Potential need for superstructure over low-lift pumping station which would result in a visual impact for residents on Bright Street.
4	Open System with new low-lift pumping station	<ul style="list-style-type: none">Smaller footprint compared to Concept 3Minimizes need for water treatment plant shut-downsPotential to provide some pre-treatment in wet-well	<ul style="list-style-type: none">Higher Capital Cost compared to Concept 1 and 2Limited opportunity for future capacity expansion

Preliminary Preferred Solution



- **New Intake operating as an Open system with a new low-lift pumping station.**
The new intake will extend approximately the same distance, approximately 400m from the shoreline.
- **Key advantages:**
 - An **Open System** is the preferred solution to be both cost-effective and have the capacity for growing demand
 - **Maintaining current depth and location** of the intake pipe is the preferred option due to small cost-to-benefit ratio of extending the intake
 - **Long-term impacts on adjacent property** are eliminated by confining in-land works within existing site limits. **No land acquisition required.**
 - In-land works **minimize construction challenges** for the connection to a new low-lift pumping station.
 - Staging opportunities to **minimize interruptions to operation and protection of existing intake pipe while construction is taking place.**
 - New intake will include **Zebra Mussel and Frazil Ice Control** systems to prevent frazil ice blockages and Zebra Mussel infestation

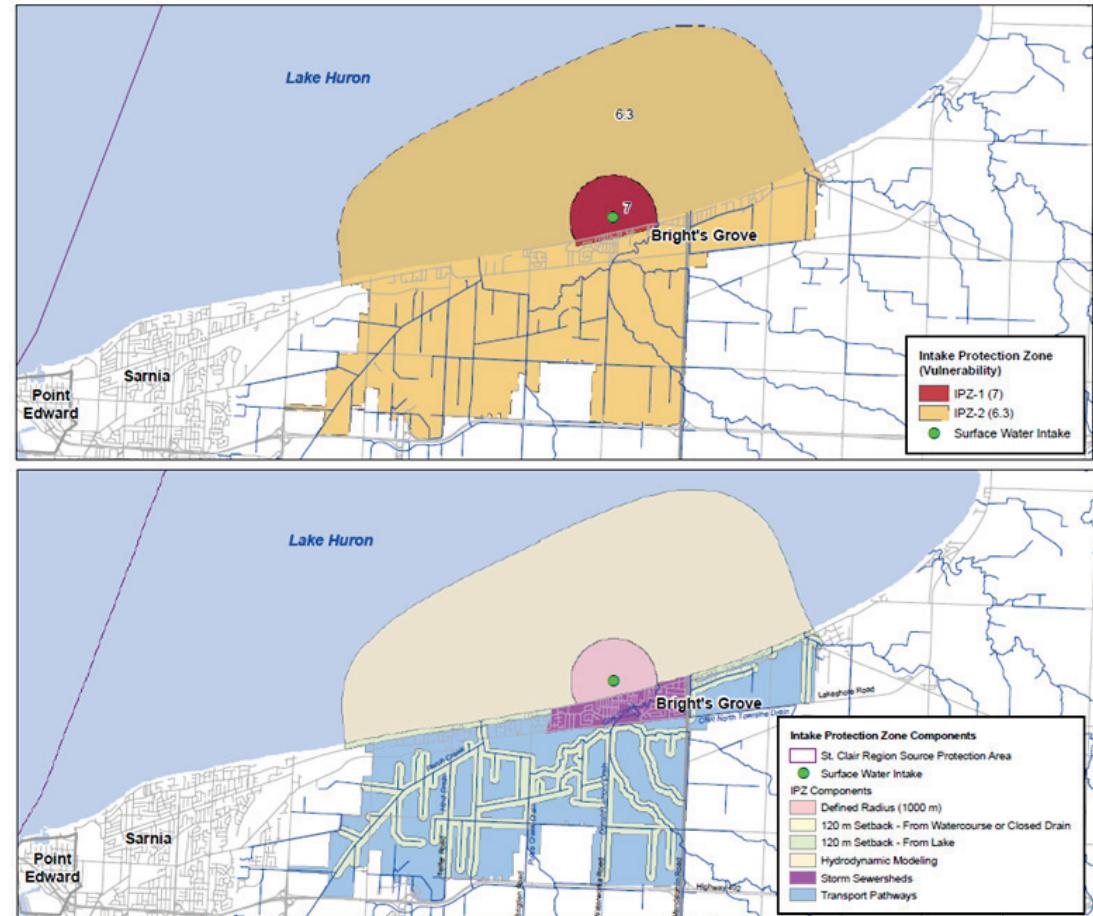


Proposed and Existing Intake Alignment and Length

Source Water Protection Update



- Intake Protection Zones represent vulnerable areas around source water intakes:
 - IPZ-1 – most vulnerable area immediately surrounding the intake. Represented by a typical distance from the intake (1 km radius).
 - IPZ-2 – larger area of concern. Modelled based on enough time to allow an operator to respond to a water quality event at the intake.
 - Intake Protection Zones will be re-assessed to ensure there is no major changes to any drainage patterns or new Transport Pathways



Source Water Protection Zone and Components, Map 4.3 Petrolia Intake Protection Zone (IPZ) St. Clair Region Source Protection Area Assessment Report, 2010

Overview of Mitigation Measures



Natural Environment

- Implement setbacks and erosion and sediment control measures.
- Minimize vegetation and tree removals through design. Apply timing window for tree clearing activities.
- Avoid construction within Species at Risk habitat or outside breeding windows. Additional screening for Species at Risk.
- All activities to comply with Endangered Species Act.
- Use previously disturbed areas for construction laydown and staging to the extent possible.

Technical and Operational

- Phased-implementation approach for the protection and continued operation of the existing intake.
- Appropriate standard construction techniques and mitigation measures will be implemented.
- Bathymetric survey has been completed to confirm the approximate location of new intake.
- Confirm delineation of Intake Protection Zones.

Socio-Cultural Environment

- All construction will adhere to strict safety guidelines.
- Temporary measures will be undertaken during construction to minimize noise, dust and vibration impacts.
- In-water works will comply with the Canadian Navigable Waters Act to ensure no interference with navigation.
- On-shore construction to be confined within the water treatment plant property limits or the adjacent shoreline with minimal interference to the neighboring residents.
- Notification to adjacent property owners prior to construction.

Cultural Heritage

- Completion of a Cultural Heritage Impact Assessment.

Typical Marine Construction Equipment



Excavation of marine trench with floating dredging equipment



Installation of intake pipeline with ballast to prevent pipeline from floating



Onshore installation of intake pipeline

Thank you for Participating!

Please Stay Engaged

After the virtual Public Information Centre,
the project team will:

- Review and consider input received during the virtual Public Information Centre
- Confirm the recommended water supply solution
- Prepare Class Environmental Assessment Report
- Issue Notice of Study Completion
- File Class Environmental Assessment Report on the public record for public review

Stay Involved!

Please complete the **Online Comment Form**
available on the webpage by April 30, 2023.



Project Information

- For more information about this project, please visit our webpage:
town.petrolia.on.ca/planning-development/brights-grove-wtp/
- Should you have any questions or comments at any time during the project, please contact:

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CIMA+

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you'll be surprised!

Thank You!

We appreciate your time and
interest in this project