



# Municipal Class Environmental Assessment for Expansion of the Tiverton Water Supply System

COUNCIL UPDATE

FEBRUARY 26, 2024

# Agenda

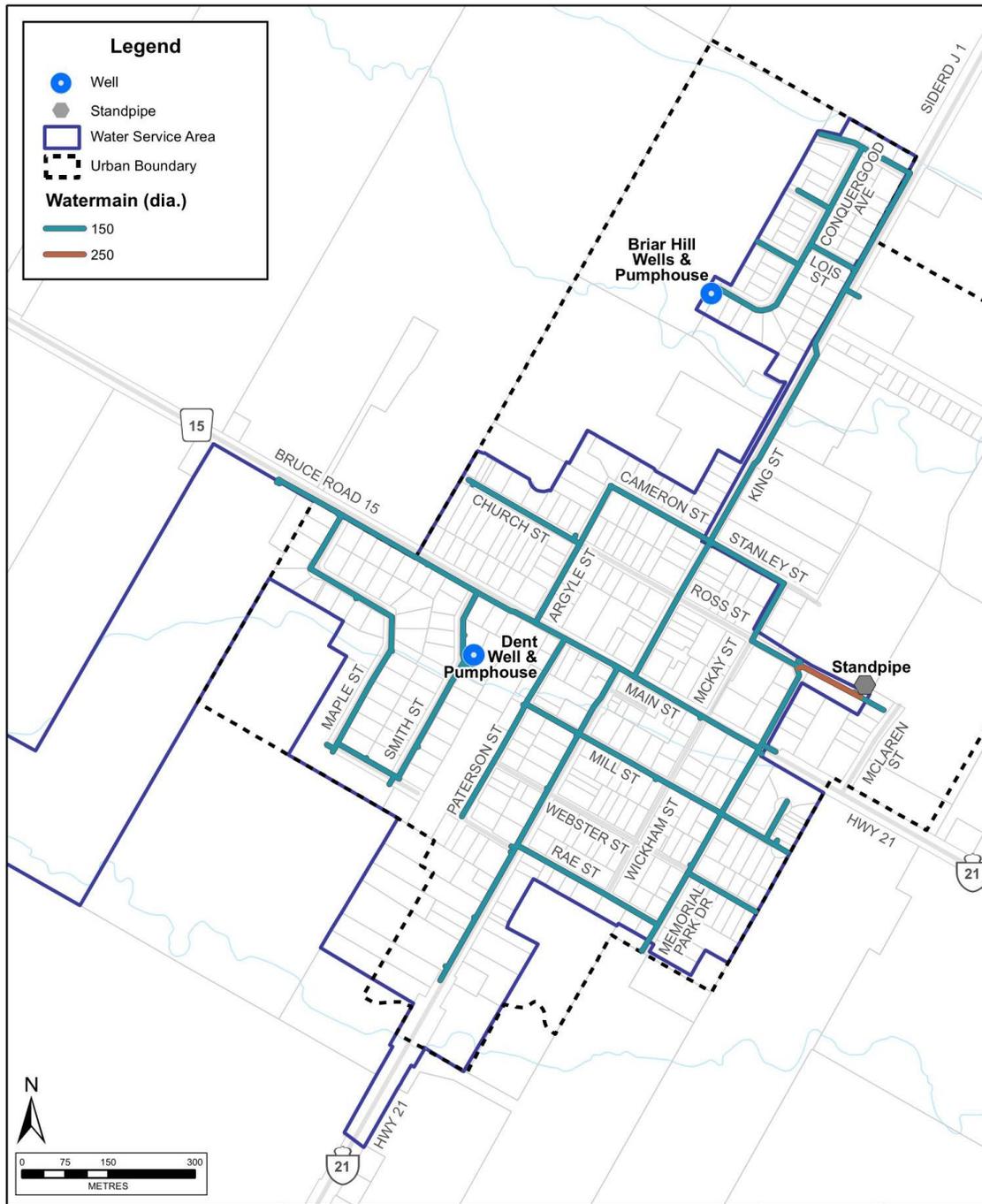
1. Background - Tiverton Drinking Water System
2. Identified Issues
3. Municipal Class Environmental Assessment (MCEA) Process
4. Phase 1 – Identification of the Problem/Opportunity
5. Phase 2 – Identify Alternative Solutions
6. Phase 2 – Evaluate Alternative Solutions
7. Preliminary Preferred Solution
8. Impacts of Preferred Solution
9. Next Steps

# Tiverton Drinking Water System

- ▶ System supplied by three (3) groundwater wells, drilled in 1971, 2003 and 2006. The Briar Hill well site (36 Conquergood Ave.) has two wells and the Dent well site (6 Smith St.) has one well.
  - ▶ At each well site there is a pumphouse containing flow metering, iron and manganese sequestering system, sodium hypochlorite system for primary and secondary disinfection, and a standby generator.
- ▶ Approximately 7.9 km of watermain and approximately 372 connections servicing approximately 717 persons as of 2021.
- ▶ PTTW limits takings to 775 m<sup>3</sup>/day.



# Tiverton Drinking Water System

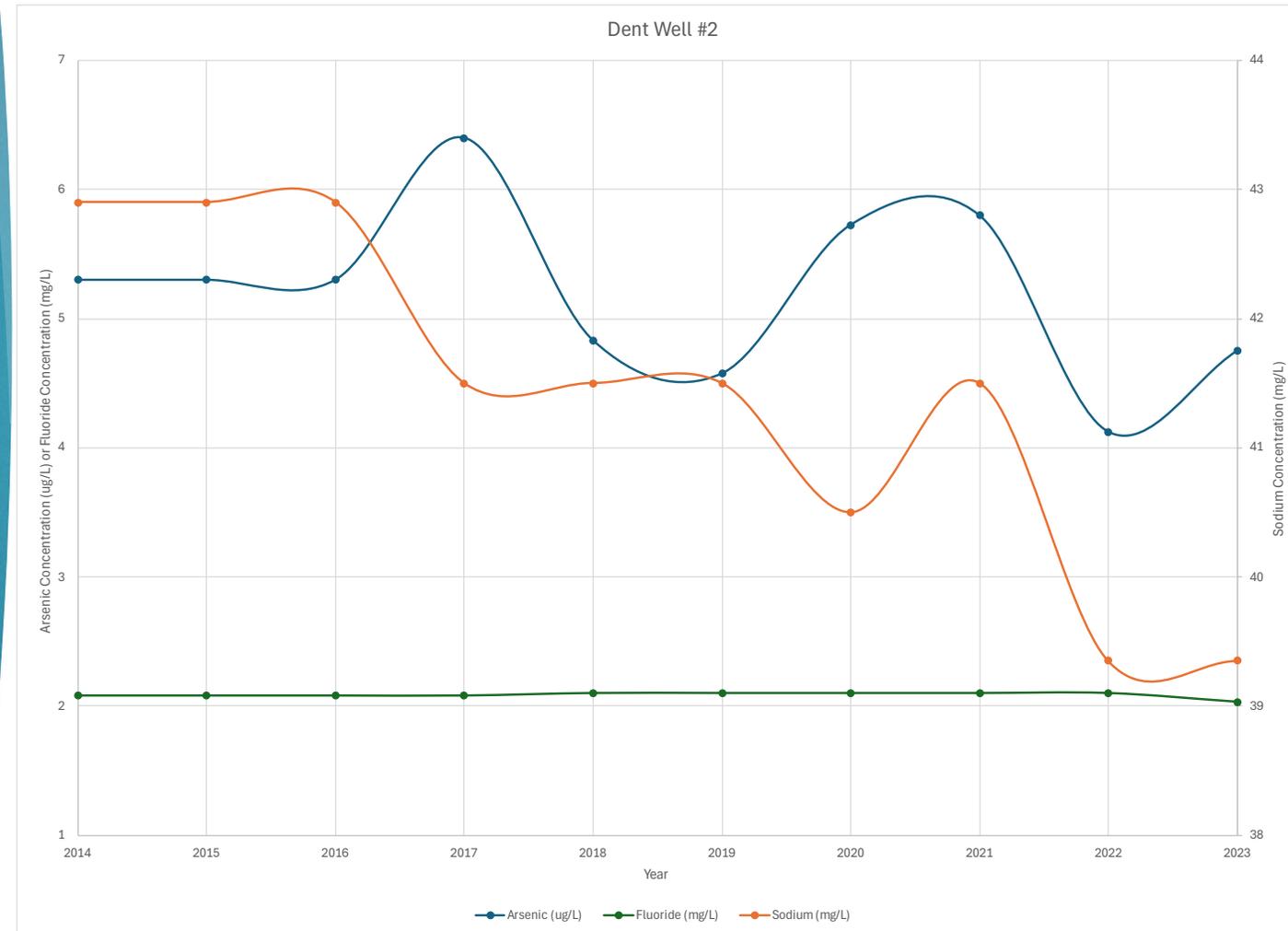


# 2023 Water & Wastewater Master Plan Findings (Tiverton Water System)

- ▶ Current maximum demand = 616 m<sup>3</sup>/day or 1.66 m<sup>3</sup>/day per customer.
- ▶ Commitments for future development = 424 m<sup>3</sup>/day for 256 Equivalent Residential Units (ERU).
- ▶ Uncommitted Reserve Capacity = Total Capacity – Current Demands – Commitments.
- ▶ Uncommitted Reserve Capacity = 775 m<sup>3</sup>/day – 616 m<sup>3</sup>/day – 424 m<sup>3</sup>/day  
= - 265 m<sup>3</sup>/day or -160 ERU  
**The system is therefore, overcommitted in terms of water supply.**
- ▶ **Master Plan recommended an EA to look at options to increase water supply capacity.**

# Other Issues

- ▶ Condition of the Briar Hill well
  - ▶ Casing of the well is deteriorating and could fail.
  - ▶ Mechanical and electrical equipment at the site is reaching end of useful life.
- ▶ Concerns regarding water quality
  - ▶ Ontario Drinking Water Standards
    - ▶ Arsenic – 10 ug/L (values above half this require increased sampling frequency)
    - ▶ Fluoride – 1.5 mg/L
  - ▶ Safe Drinking Water Act requires notice to Medical Officer of Health for sodium above 20 mg/L



# Current Issues



The system lacks adequate reserve capacity in terms of supply of raw water.



Population growth will increase water needs.



Condition of well casing, electrical and mechanical equipment at end of life, potential to improve water quality & mitigate risks.



To address these issues, the Municipality of Kincardine has initiated a Municipal Class Environmental Assessment.

# Municipal Class Environmental Assessments (MCEA)

- ▶ The MCEA is the planning and approval process for municipal road, **water**, wastewater and stormwater projects.
- ▶ Municipalities must follow the MCEA process to meet the requirements of the Environmental Assessment Act.
- ▶ The MCEA process includes:
  - ▶ Consultation
  - ▶ Consideration of alternative solutions
  - ▶ Identifying impacts of the alternative solutions
  - ▶ Documenting the decision-making process.

# MCEA Phase 1 – Define the Problem or Opportunity

The 2023 Water and Wastewater Master Plan identified the Tiverton Drinking Water System (DWS) is overcommitted and additional supply capacity is required to support future growth.

# Phase 2 – Identify Alternative Solutions

Alternative	Initial Evaluation	Carried Forward for Further Evaluation (Yes or No)
<b>1 – Expand existing or construct new groundwater wells</b>	<ul style="list-style-type: none"> <li>• May need to consider multiple well sites to achieve needed yields.</li> <li>• Potential to secure sufficient water supply for current and future needs.</li> <li>• Can connect new wells to existing water distribution system.</li> <li>• Will require drilling of a test well(s).</li> <li>• Potential for significant capital costs if multiple wells are required.</li> <li>• New wells will add new Source Water Protection areas.</li> <li>• Potential for highly mineralized raw water quality.</li> </ul>	Yes – carry forward for further evaluation.
<b>2 – Construct a BPS to connect to the Kincardine Drinking Water System at Inverhuron</b>	<ul style="list-style-type: none"> <li>• Sufficient supply capacity available in the Kincardine Drinking Water System to accommodate existing and future growth in Tiverton.</li> <li>• Would have significant capital costs.</li> <li>• Would require a Booster Pumping Station (BPS) in Inverhuron and watermain to extend from east on Bruce Road 15.</li> </ul>	Yes – carry forward for further evaluation.
<b>3 – Reduce demands/ limit community growth</b>	<ul style="list-style-type: none"> <li>• Would require a significant decrease in current water usage to provide enough capacity for committed development.</li> <li>• Would limit future growth opportunities in Tiverton.</li> <li>• Does not address the need for additional supply.</li> </ul>	No – not considered practical or feasible given the current demand commitments.
<b>4 - Do Nothing/Status Quo</b>	<ul style="list-style-type: none"> <li>• Considered if the impacts of other alternatives are too great or cannot be mitigated.</li> <li>• Does not address the need for additional supply.</li> <li>• Limits future growth opportunities.</li> <li>• Will be used as the benchmark for comparison of other alternatives.</li> </ul>	Yes – must always be considered – Carry forward as Alternative 4.

# Alternative 1: Expand Existing or Construct New Groundwater Supply

- ▶ Ability to use/expand existing wells limited
  - ▶ Review of existing wells found little potential to re-rate existing wells.
  - ▶ Concerns with condition of Briar Hill well casing, condition of wellhouse equipment.
- ▶ New Well(s)
  - ▶ Expect similar water quality – mineralized with potential for elevated total dissolved solids, sulphate, iron and sodium. Arsenic and fluoride may be present.
  - ▶ Information from other wells indicates a 54% chance of a meaningful yield for municipal use (i.e. rate above 200 L/min). Multiple test sites can be expected.
  - ▶ Previous testing data indicates it is probable that two additional, properly-spaced well fields (i.e. spaced >700 m apart) could be required, and should be more than 350 m away from the existing wells.
  - ▶ Need to set back from existing domestic and commercial wells within the area.
- ▶ Need to maintain/rehabilitate existing well sites in conjunction with new sites.

# Siting new wells

- ▶ Recommended a minimum of 350 m distance between existing wells to avoid well inference



# Alternative 1 - Costs

- ▶ Maintaining a groundwater based supply will require reconstruction of the Briar Hill treatment/electrical building and replacement of the 1971 well – in the order of \$3,600,000
- ▶ Construction of new additional well site – assume equal to Briar Hill reconstruction in the order of \$3,600,000 but:
  - ▶ Likely need two additional well sites for total future projected demand.
  - ▶ Costs will vary if additional treatment equipment needed, additional watermain to connect to system, land acquisition.



# Alternative 2: Construct a connection to the Kincardine DWS at Inverhuron

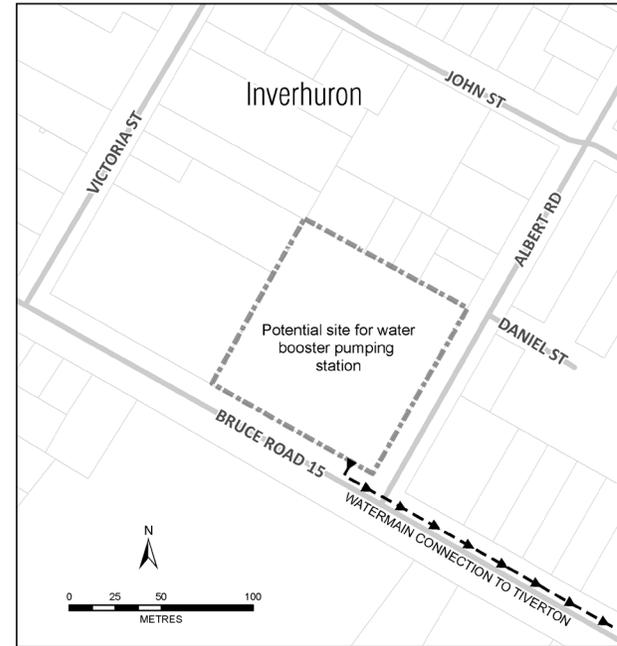
This alternative involves:

Constructing a Water  
Booster Pumping  
Station (BPS)

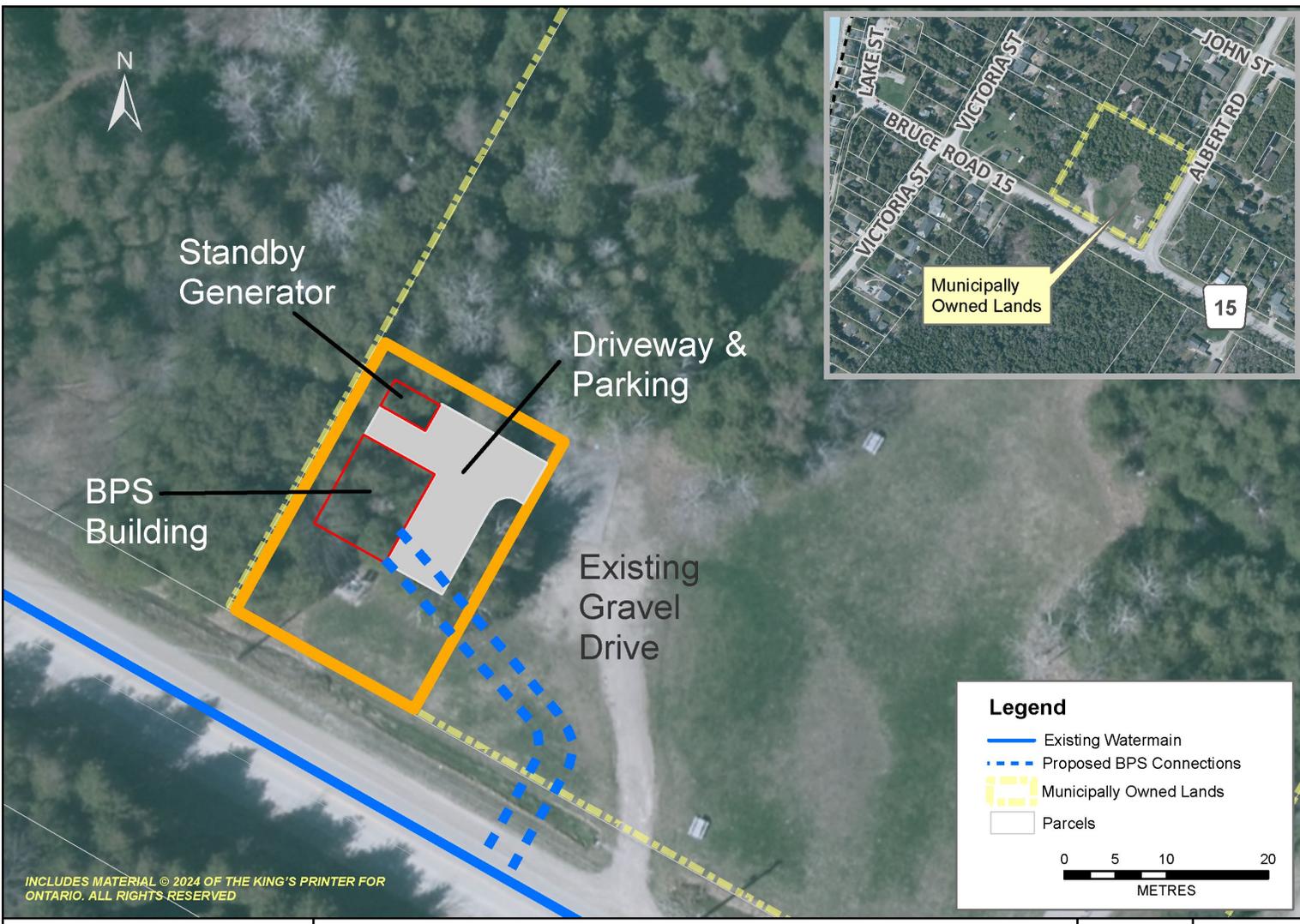
Constructing a  
watermain extension  
on Bruce Road 15



Site identified for new BPS at 3194  
Bruce Rd 15



# Site Layout Option 1





# Site Layout Option 2



# Preliminary Evaluation of Potential Impacts

Criteria	Potential Impact	Potential Mitigation Measures
Natural	<ul style="list-style-type: none"> <li>• Vegetation and tree removal for construct BPS at some locations within Park.</li> <li>• Limited wildlife habitat present.</li> <li>• No adjacent water features at the site.</li> <li>• Allows for decommissioning of groundwater wells (eliminates transport pathways).</li> </ul>	<ul style="list-style-type: none"> <li>• Locate the BPS in the cleared area of Park.</li> </ul>
Social	<ul style="list-style-type: none"> <li>• Adjacent properties may experience noise and traffic impacts during the construction period.</li> <li>• Access to site may be limited during construction.</li> <li>• Will support future growth in Tiverton.</li> <li>• Change in water taste and chemistry compared to groundwater.</li> <li>• Loss of a portion of the Park land.</li> <li>• Eliminate Source Water Protection areas around existing wells &amp; avoid areas for new wells.</li> <li>• Generator will have noise impacts when operating during emergency situations.</li> </ul>	<ul style="list-style-type: none"> <li>• Localized construction-related impacts will be limited to the construction period.</li> <li>• Limited noise or traffic impacts when in operation.</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>• Archeological Screening Stage 1 and 2 completed.</li> </ul>	<ul style="list-style-type: none"> <li>• No archeological resources were discovered.</li> </ul>
Economic	<ul style="list-style-type: none"> <li>• Capital costs associated with construction.</li> <li>• Probable that long-term operating &amp; maintenance costs are lower than multiple well sites.</li> </ul>	<ul style="list-style-type: none"> <li>• Grant funding could reduce costs.</li> <li>• Future growth could contribute through Development Charges.</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• Will provide reserve capacity in the Tiverton DWS.</li> <li>• Sufficient capacity for long-term growth.</li> <li>• Will increase system resiliency for increased water use associated with climate change related drought conditions.</li> <li>• Addresses issues with well casing, other equipment, and eliminates potential need for arsenic treatment process.</li> <li>• Less mineralized water is less corrosive to distribution equipment, household plumbing.</li> </ul>	

# Probable Project Costs

- ▶ Probable costs:
  - ▶ Booster Pumping Station: \$2,200,000
  - ▶ Trunk Watermain: \$2,600,000
  - ▶ Design and Approvals: \$275,000
  - ▶ Contract Administration: \$335,000
- ▶ Estimated total cost: \$5,410,000 + HST
- ▶ Decommissioning existing wells/wellhouses are additional future costs.
- ▶ Portion of project costs attributable to future growth could be recovered through Development Charges.
  - ▶ Based on current demands and estimated design capacity, approximately 50% of project costs are attributable to existing, 50% to future.

# Alternative 4 – Do Nothing/ Status Quo

- ▶ Does not address the need for additional supply capacity.
- ▶ Would still require reconstruction and replacement of Briar Hill Well and wellhouse (estimated cost in the order of \$3,600,000).
- ▶ However, this alternative is always considered through the EA process for comparison and in case the other alternatives cannot be implemented.

# Evaluation of Alternatives

Alternative	Advantages	Disadvantages	Preferred?
Alternative 1 – Expand Wells or New Wells	<ul style="list-style-type: none"> <li>• Make use of some existing infrastructure.</li> <li>• Opportunity to defer some costs associated with expansion (i.e. initially construct 1 additional well site, wait to construct another).</li> </ul>	<ul style="list-style-type: none"> <li>• Little potential to re-rate existing wells.</li> <li>• Probable need for two new well sites.</li> <li>• Potential for mineralized water &amp; ongoing treatment needs.</li> <li>• May require arsenic treatment process for existing &amp; future wells.</li> <li>• Will need to upgrade/replace infrastructure at existing well sites.</li> <li>• Expanded/new source water protection areas.</li> <li>• Overall cost (initial + long term).</li> </ul>	<ul style="list-style-type: none"> <li>• No</li> </ul>
Alternative 2 – Connect to Kincardine DWS	<ul style="list-style-type: none"> <li>• Sufficient supply to support growth.</li> <li>• Connection available at Inverhuron.</li> <li>• Eliminates potential need for arsenic treatment, upgrading/replacing existing well equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of portion of park site.</li> <li>• Utilizes some capacity from Kincardine DWS, making it unavailable for other potential future customers.</li> <li>• Initial cost.</li> </ul>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>
Alternative 4 – Do Nothing/ Status Quo	<ul style="list-style-type: none"> <li>• Lower cost</li> </ul>	<ul style="list-style-type: none"> <li>• Does not address problem.</li> <li>• Will still need to address equipment needs (well casing, electrical, mechanical).</li> </ul>	<ul style="list-style-type: none"> <li>• No</li> </ul>

# Public Input

- ▶ PIC held on October 30, 2024.
  - ▶ Approximately 15 persons in attendance
- ▶ Narrated presentation available on Municipality's website.
- ▶ No comments received following PIC.

Question/Comment	Response
Is there capacity at the Kincardine Water Treatment Plant to supply Tiverton?	Yes, there is sufficient supply at the Water Treatment Plant and in the lakeshore watermain to accommodate Tiverton.
Could an existing well be used or could new wells be drilled at the existing well sites?	The hydrogeologist consulted indicated the ability to utilize the existing wells and sites is limited. It is unlikely we would secure the supply of water needed.
What will the financial impact be on existing residents?	It is expected the costs attributable to the existing population of Tiverton will be recovered through rates and reserves. The Municipality is also actively pursuing grant opportunities. The costs attributable to future growth could be recovered through development charges.
Will this fix pressure issues?	Will be able to supply water to the distribution system at the same pressure, but it is difficult to say if it will address localized issues.
Should we be concerned about the existing well water quality?	Elevated fluoride and sodium and mineral levels are not uncommon in the groundwater locally. The sodium levels are above the level that requires notification of the local medical officer of health for people who may be on a reduced sodium diet. The current drinking water is considered safe to consume.
What are the long-term impacts financially?	The existing wells, specifically Briar Hill Well #1, require rehabilitation. It is likely a new Briar Hill Well will be needed to replace Well 1, as well as replacement of some of the electrical and mechanical equipment. In the future, the other wells will also rehabilitation. There will be ongoing financial costs associated with maintaining the existing wells. The BPS is another asset that will need to be maintained over the long term, but it is expected to have a relatively long life with less maintenance requirements than the existing wells.
Can the BPS be sited to minimize impacts to the park?	Yes, exact placement of the BPS will determined during the design phase, but shifting the BPS towards the road or west side of the property could be considered.
There is a group interest in redevelopment of the park at Inverhuron and have been working with the Municipality. Interested in the placement of the BPS.	Noted and will work with the group through the Municipality.

# Next Steps

- ▶ Council provides direction to proceed with preferred solution (a new BPS and connection to the KDWS) as presented in draft Screening Report.
- ▶ Draft Screening Report circulated to agencies for review
- ▶ Finalize Screening Report and issue Notice of Completion.
  - ▶ 30 day public review period.
- ▶ Design Phase:
  - ▶ Finalize location at site.
- ▶ Apply for Approvals.
- ▶ Construction.



# Questions and Comments