Sunderland Water Supply, Water Storage, and Pumping Facilities Schedule "B" Class Environmental Assessment

Public Information Centre #2 – Script

Slide 1: Cover Page (No Speaking)

Slide 2: Welcome

Hello and welcome everyone to the second Public Information Centre for the Schedule B Class Environmental Assessment for the Sunderland Water Supply, Water Storage, and Pumping Facilities Project. My name is Stephanie Tran, and I am part of the Environmental Assessment Team for this project for R.V. Anderson Associates Limited, an Engineering Consulting Firm, and I will be narrating this presentation.

I would like to take a few minutes to explain the format of this virtual Public Information Centre, or "P-I-C". Due to the COVID-19 pandemic, this PIC is taking place virtually. This video, along with the presentation panels and script are posted on the Region of Durham's project website. We ask that you review this video and the other project information available at your leisure and provide comments back to the Project Team.

The Region of Durham is new to virtual public meetings, and we'd like to ask for your patience and understanding as we navigate this new format. While online platforms don't allow for quite the same face-to-face interaction, please know that we greatly value your feedback and questions. We will make every effort to ensure your voice is heard and your questions are answered.

Slide 3: What is the purpose of this PIC?

The Project Team will be presenting an overview of this study, including the Municipal Class Environmental Assessment Process and background on the Sunderland Water Supply and Storage System. We will be presenting a recap of the Study Area, Problem & Opportunity Statement, List of Alternative Solutions for Water Supply and Water Storage, and Evaluation Criteria presented in PIC#1 in November 2019. We will also present the Evaluation of the Alternative Solutions for Water Supply and Water Storage, and the Preferred Alternatives identified through the Class EA process. Finally, we will present the next steps in the process, and explain how to submit your questions or comments to the Project Team.

Slide 4: We Want Your Feedback

This video, the presentation material, and the script of this presentation are posted on the Region of Durham's project website. Please submit any questions or comments to the Project Team at the contact information provided. Your feedback is welcome and encouraged! Please note that comments will be received until October 27, 2021, which is four (4) weeks after the release of this virtual PIC.

With that, we will dive into the presentation.

Slide 5: What is the purpose of this Municipal Class EA?

The Regional Municipality of Durham is undertaking this project as a Municipal Class Environmental Assessment (MCEA) study. The Municipal Class EA process is an approved planning process set for municipal infrastructure projects, including water and wastewater projects, and is used by municipal proponents to meet the requirements of the Ontario Environmental Assessment Act. The Municipal Class EA process allows for the identification and evaluation of alternative solutions to a problem or opportunity and mandates that a minimum number of opportunities for public and regulatory agency input be provided.

The objectives of this study are to:

- Plan for a permanent source of water supply.
- Plan for additional water supply capacity.
- Plan for additional water storage capacity.
- Plan for additional pumping facilities.
- Address aesthetic quality of Sunderland's drinking water (taste, odour and colour).

The additional capacity is required to provide a secure and sustainable water supply system for the growing community of Sunderland, under the land uses currently approved under the Durham Regional Official Plan (2017).

Slide 6: The Class EA Process

Moving to Slide 6, this is a **Schedule 'B'** project and is required to follow **Phase 1 and 2** of the Municipal Class EA process. The steps completed to date in the Schedule B Municipal Class EA process, are presented on this slide, along with upcoming steps in the process. As a summary of the project progress to date:

- This study started in February 2019 with the publication of the Notice of Commencement.

- The Project Team identified a problem and opportunity statement, preliminary Water Supply and Water Storage alternatives, and proposed evaluation criteria. The Project Team presented these to the community at the first PIC in November 2019.
- Following PIC #1, the Project Team completed several supporting studies including a Groundwater Exploration Program, Hydrogeological Modelling, Natural Environmental Inventory, Cultural Heritage Assessment, Archaeological Assessments, and Geotechnical Investigations.
- The Team then evaluated the alternative solutions for Water Supply and Water Storage and identified the preferred alternatives for each, along with phasing to implement the preferred alternatives as Sunderland grows.
- This brings us to the end of Phase 2 of the Class EA process, where the evaluation results and preferred alternatives are being presented for feedback as part of this PIC.

Slide 7: Study Area

As a refresher, from the first PIC, the Study Team identified the Study Area for the project.

The Study Area included as part of this Class EA is outlined in the map on the right hand side of this slide in the red box. The Study Area includes the existing urban area boundary for Sunderland (which is outlined in yellow), areas nearby the existing boundary, the areas where existing Municipal Wells #1 and #2 are located, by Concession Road 6, and the existing water storage Standpipe and temporary Municipal Well #3, by Jane Street.

Slide 8: Problem and Opportunity Statement

From the first PIC, The Study Team also identified the Problem and Opportunity Statement for the project.

The existing Sunderland Water Supply and Storage System requires various improvements to support potential growth for the Sunderland urban area including upgrading the available water supply, addressing aesthetic water quality, increasing the amount of water storage, and improving redundancy of the overall system.

To address these improvements, this Class EA will identify the preferred environmentally and economically responsible solution which will:

1. Provide long-term water supply, water storage capacity, pumping facilities and redundancy, to satisfy the existing water demand and support potential growth within the existing Sunderland urban area as per the land uses currently approved under the Durham Regional Official Plan (2017).
2. Meet Ontario Drinking Water Standards for health-related parameters.
3. Strive to address aesthetic aspects of the Ontario Drinking Water Standards.

Slide 9: Supporting Studies

Additional studies were undertaken throughout this Class EA to support the development of a list of alternatives, identify potential impacts, identify mitigation measures and support the evaluation process. Studies included:

- A Groundwater Exploration Program
- A Geotechnical Investigation
- A Hydrogeological Modelling
- An Archaeological Assessment
- A Cultural Heritage Assessment, and
- A Natural Environmental Impact Assessment

The results of these studies are included in various aspects of the EA process and presented throughout the upcoming slides.

Slide 10: Water Supply

Now we will go through the Water Supply aspect of this Class EA. This includes an overview of the existing municipal water system in Sunderland, a timeline of changes to the water supply system, a discussion of the upgrades required and possible solutions, and a recommendation on how to address Sunderland's water supply requirements now and in the future.

Slide 11: Existing Water System

The current Municipal Water System servicing the Sunderland urban area is comprised of three municipal groundwater wells.

Municipal Well Number 1, or MW1, was built in 1957 and is classified as a Groundwater Under the Direct Influence of Surface Water, or GUDI, with in-situ filtration. Currently, MW1 is only able to operate and supply water at a rate of 8.2 L/s due to existing operational limitations, however, it does have a higher permitted rate. MW1 is also on the same site as Municipal Well Number 2, or MW2, which is located off Concession

Road 6. MW1 and MW2 each have their own pump houses and are treated via a common treatment system at the site.

MW2 was built in 1972 and is also classified as a GUDI well. Over the past years, the water quality from MW1 has declined, resulting in the aesthetic objectives and operational guidelines for manganese, iron, and hardness being exceeded. Additionally, the ultraviolet transmittance (UVT) of the water from MW2, a parameter used to disinfect the water using ultraviolet (UV) units, has increased to a point where the existing treatment system is unable to properly treat the water from MW2. Due to these water quality and operational issues, MW2 was taken out of operation.

This brings us to Municipal Well Number 3, or MW3. MW3 was constructed and has been operational since 2020. It was developed to temporarily supplement MW1 to provide security of the Sunderland Water Supply System, due to MW2 being taken offline. MW3 can operate up to a rate of 10 L/s and will operate until a permanent solution for water supply is determined. MW3 is located at the same site as the existing Standpipe just off Jane Street. It has its own stand-alone treatment system on the same site.

Slide 12: Timeline of Changes to the Water Supply System

Slide 12 provides an overview of the timeline of changes to the Sunderland Water Supply System and the current Class EA Process.

- In the summer of 2017, MW2 was taken offline as a result of operational and water quality issues. This meant that MW1 was the only well remaining operational to provide water supply to Sunderland.
- Due to this, between the summer of 2017 and mid-2018 the Region undertook an emergency well exploration program to urgently find a backup groundwater source to supplement MW1. The Region identified a new source at the same property as the existing standpipe.
- Additionally, during this time the Ministry of the Environment, Conservation, and Parks (or Ministry) issued a Declaration Order to permit the installation of an emergency well (i.e., MW3). This order also required the Region to complete a Class EA to address Sunderland's long-term water supply needs.
- From 2018 to 2020, the Region completed the design and construction of the emergency well, MW3, and the associated treatment system at the site of the existing Jane Street Standpipe. This temporary well has been operating with MW1 to supply water to Sunderland since then.
- For the Class EA required by the Ministry, the Notice of Commencement was issued in February 2019 and the first PIC was held in June 2019. A groundwater exploration program to secure a long-term source of water was completed

between Winter 2019 and Winter 2020. Other supporting investigations were completed between Winter 2019 and Fall 2020.

Slide 13: Long-Term Upgrades Required for the Water Supply System

As a refresher from the first PIC, this slide presents the required upgrades to the Sunderland Water Supply System for the long-term. We know that the population of Sunderland will grow over time and have estimated that it may grow as high as 4,372 people for the "Ultimate Build-Out" scenario. This number is based on the land uses currently approved under the Durham Regional Official Plan. It is important to note, that the timeline for this growth from the current day to Ultimate Build-Out is variable. The Region will continue to monitor the community's population growth to identify when upgrades are required to the water supply and water storage systems. These upgrades would be implemented in phases over time.

Sunderland's current firm water system capacity is 8.2 L/s. This total capacity is based on the water supply available to meet the water demand of Sunderland if the largest well is out of service. Looking to the future, the estimated "Firm Capacity" required is 31 L/s for Ultimate Build-Out. With MW1 currently operating at 8.2 L/s and MW3 temporarily operating up to 10 L/s, the Firm Capacity of the existing system does not meet the community's needs. Due to this, PIC #1 identified that additional water supply is needed, and the number of new wells and phasing of the development of these wells would be identified as part of this Class EA.

Slide 14: Assessment of Preliminary List of Water Supply Alternatives

The Preliminary List of Water Supply Alternatives on this slide was presented at the first PIC. Alternatives 1 through 3 in the first column highlighted in grey were: do nothing, limit community growth, and implement water conservation measures, were not considered further than PIC # 1 as they did not meet the Problem and Opportunity Statement.

Alternatives 6c to 9 in the third column on the right highlighted in yellow, were not considered further as they would have significant economic costs compared to other feasible alternatives available. Alternatives 6c to 9 included developing a new groundwater source at a nearby community that would be brought to Sunderland, source water from an existing groundwater or surface water system to Sunderland or developing a new surface water supply. These alternatives would only be considered if other feasible alternatives were determined to be no longer viable.

This left Alternatives 4 to 6b as possible alternatives, which are shown in second, centre column highlighted in green.

- Alternative 4 considered optimizing and restoring the capacity of MW1.

- Alternative 5 considered restoring MW2 to its original capacity though added treatment.
- Alternative 6A considered the development of a new local groundwater well or wells either in the Sunderland urban area or in the immediate surrounding area to supplement and/or replace the existing wells.
- Alternative 6B considered transitioning MW3 from a temporary well into a permanent part of the Sunderland Water Supply system.

These alternatives have been reviewed further since PIC # 1.

Slide 15: Groundwater Exploration Program

A groundwater exploration program was completed in Winter 2020 as part of the evaluation of Alternative 6A – Development of a New Local Groundwater Well in or immediate to the Sunderland urban area. This program included drilling test wells to determine whether there is a viable groundwater source with sufficient quality and quantity to meet the Ultimate Build-Out needs.

The groundwater exploration program included three areas:

- Area A: This area included the future Park Land property west of the existing Jane Street Standpipe, and an area to the far west on Kaitlin Corporation property proposed for future development. Overall Area A produced a good quantity of water; however, the water quality would require additional treatment (e.g., to lower nitrate concentrations).
- Area C: This area is on existing property owned by Brock Aggregates just off Concession Road 6 and to the east of existing Municipal Wells 1 and 2. The groundwater exploration program for this area found that there was a good quality of water; however, there was limited quantity.
- The final area shown on the map is Area B, which is in the Right-Of-Way of Concession Road 5 and St. Mary's Boulevard to the South-West of Sunderland. Area B was not explored as the results from Area A and C were favourable. As well, Area B would be technically complex and have higher economic costs to implement, as it is further away from Sunderland and the existing municipal water system.

Slide 16: Groundwater Exploration Program: Test Well Locations

Slide 16 shows the location of the test wells in Areas A and C with favourable results in light blue, along with the locations of the existing municipal wells in red. Overall, the results from the test wells in Area A and Area C, demonstrated that a combination of new wells from these areas and the existing wells would obtain the firm capacity required for an Ultimate Build Out of 31 L/s. Permanent wells will need to be developed and tested at the test well locations in the future. The final capacities of the permanent wells may vary depending on the conditions encountered at that time.

The groundwater exploration program also confirmed that Area A and Area C are separate aquifers. This means that using wells in Area A for example, will not affect the use of wells in Area C, and that both areas have separate water quality characteristics. This provides an opportunity to not only have redundancy of the wells themselves, but also of the aquifers which are the source of the water for Sunderland. This leads to a more secure long-term water system if wells are developed in both areas.

Slide 17: Screening of Short-Listed Water Supply Alternatives

With the groundwater exploration program results, and the known existing conditions and limitations of the existing municipal wells, the short-list of water supply alternatives was screened further, as shown on the table on Slide 17.

Alternative 4 to optimize and restore the capacity of MW1 was not carried forward as a preferred alternative for a long-term water source. MW1 has existing operational and maintenance issues with the existing UV treatment system. It also has deficiencies that limit the ability to increase the flow from the well any further than the existing 8.2 L/s. Issues and deficiencies include a decrease in water quality when the well is pumped at a higher flow rate, concerns that the issues with MW2 could occur at MW1 over time, aging infrastructure, operations and maintenance issues with the existing pumphouse, and that it is located on a moderate to highly vulnerable aquifer which would require source water protection for MW1. MW1 will continue to be used in the near-term, but it is recommended that this well be phased out of service and decommissioned.

Alternative 5 to restore MW2 to its original capacity through the additional treatment was also not carried forward. The existing operational and maintenance issues and deficiencies with MW2 limit the ability to restore this well. In 2017, maintenance of this well was undertaken to try to restore the capacity and quality of the well; however, the water quality remained poor and the shallow overburden aquifer and confining layer MW2 draws water from, was damaged. Additionally, the water quality from MW2 has low Ultraviolet Transmittance (UVT). This prevents proper disinfection when using the existing UV light system. Adding additional treatment to MW2 would not be feasible, and it is recommended that MW2 remain out of service and be decommissioned.

Slide 18: Screening of Short-Listed Water Supply Alternatives (Continued)

Based on the results of the groundwater exploration program, alternative 6A to develop a new groundwater well or wells in Sunderland or the immediate surrounding area, to supplement or replace the existing well or wells was determined to be a feasible alternative. As such, Alternative 6A was carried forward for further evaluation.

Alternative 6B to transition MW3 from a temporary well to a permanent part of the water supply system, to supplement or replace the existing wells in Sunderland, was determined to be feasible, but only in combination with Alternative 6A where a new groundwater well is still developed. The findings of the groundwater exploration program identified that the capacity of MW3 would not be able to meet the Ultimate Build-Out capacity on its own or with the existing capacity of MW1. As such, Alternative 6B was carried forward for further evaluation in combination with Alternative 6A.

Slide 19: Preferred Water Supply Alternatives

Based on the preferred Alternatives 6A and/or 6B, potential well capacities and combinations of new wells in Area A and Area C were considered. Considerations included the possibility of transitioning MW3 to a permanent well. Additionally, the phasing of the implementation of when a new well is developed, MW3 being transitioned to a permanent well, and when MW1 is taken out of service was reviewed to allow the Sunderland water supply system to be expanded gradually as the demand for water supply grows.

Three (3) staging scenarios were developed and evaluated to meet the Ultimate Build-Out firm capacity requirement of 31 L/s and are presented on the next slides.

Slide 20: Staging Scenario 1 (Phase 1)

As a brief overview, Staging Scenario 1 would be completed in two phases. During Phase 1:

- MW1 would remain online during this phase.
- MW3 would remain online as a temporary well during Phase 1.
- New wells would be constructed at the Kaitlin Property in Area A by TW-19-3. It is estimated that two new wells would be required here (one duty and one standby) with one new pumphouse. Treatment of nitrates is required.
- This achieves a Firm Capacity of 31 L/s within Phase 1.

Slide 21: Staging Scenario 1 (Phase 2)

In Phase 2 of Staging Scenario 1:

- MW1 would be decommissioned.
- The MW3 site would be transitioned to be a permanent well, and the existing Newterra treatment system would be decommissioned.
- The wells at the Kaitlin Property in Area A by TW-19-3 would continue to be used.
- New wells would be constructed at the Park Land of Area A by TW-19-1. It is estimated that one new well would be required here.
- The pumphouse at the Kaitlin Property in Area A by TW-19-3 would be upgraded to treat water from MW3 and the new well at the Park Land.
- This achieves a Firm Capacity of 32 L/s by Phase 2.

Additionally, the Region would be looking to secure and protect the land by TW-19-4 for a future well site, if determined to be required.

The Project Team also looked at having individual pumphouses for each well site, rather than one common pumphouse for treatment. This was determined to be infeasible due to the operation and maintenance requirements, and high economic costs.

Slide 22: Staging Scenario 2 (Phase 1)

Staging Scenario 2 would be completed over two phases as well. Phase 1 includes:

- MW3 would remain online as a temporary well during Phase 1.
- New wells would be constructed at the Brock Aggregates property in Area C by TW19-4. It is estimated that three new wells would be required (two duty and one standby). A new pumphouse would be constructed to treat these wells.
- MW1 would then be decommissioned once the new wells in Area C are operational.
- This achieves a Firm Capacity of 23 L/s within Phase 1, with a worst case of 16 L/s if a well in Area A is out of service unexpectedly.

Slide 23: Staging Scenario 2 (Phase 2)

In Phase 2 of Staging Scenario 2:

- The wells and pumphouse at the Brock Aggregates property in Area C by TW19-4 would continue to be used.
- New wells would be constructed at the Kaitlin Property in Area A by TW-19-3. It is estimated that two new wells would be required here (one duty and one standby) with one new pumphouse. Treatment of nitrates is required.

- MW3 and its Newterra treatment system would be decommissioned once the new wells on the Kaitlin Property are operational.
- This achieves a Firm Capacity of 32 L/s by Phase 2.

Slide 24: Staging Scenario 3 (Phase 1)

Staging Scenario 3 would be completed in two phases. In Phase 1:

- MW3 would remain online as a temporary well during Phase 1.
- New wells would be constructed at the Brock Aggregates property in Area C by TW19-4. It is estimated that three new wells will be required (two duty and one standby). A new pumphouse would be constructed to treat these wells.
- MW1 would then be decommissioned once the new wells in Area C are operational.
- This achieves a Firm Capacity of 24 L/s within Phase 1, with a worst case of 16 L/s if a well in Area A is out of service unexpectedly.

Slide 25: Staging Scenario 3 (Phase 2)

In Phase 2 of Staging Scenario 3:

- The MW3 site would be transitioned to have a permanent well, the existing Newterra treatment system would be decommissioned, and a new pumphouse would be constructed.
- The wells and pumphouse at the Brock Aggregates property in Area C by TW19-4 would continue to be used.
- New wells would be constructed at the Park Land of Area A by TW-19-1. It is estimated that one new well would be required here. The raw water from this well would be treated at the new pumphouse at the MW3 site.
- This achieves a Firm Capacity of 32 L/s by Phase 2.

Additionally, the Region would be looking to secure and protect the land by TW-19-3 in the Kaitlin Property of Area A for a future well site, if determined to be required.

The Project Team also identified that it is preferred to have aquifer redundancy as soon as possible. This staging scenario looks at developing new wells in Area C while keeping wells in Area A online. Staging scenarios which did not prioritize aquifer redundancy were identified but not evaluated.

Slide 26: Summary of Staging Scenarios

Slide 26 summarizes the preferred wells and requirements for phasing of the three (3) staging scenarios presented in Slides 20 to 25.

In summary, Staging Scenario 1 Phase 1 will achieve Ultimate Build-Out capacity early and will provide aquifer redundancy. In Phase 2, the Ultimate Build-Out capacity will continue to be achieved and will reduce the risk of relying on MW1 long-term with MW1 decommissioned. However, there will be no aquifer redundancy once MW1 is offline.

For Staging Scenario 2, a total firm capacity of 24 L/s will be achieved in Phase 1. This allows for growth, however Ultimate Build-Out firm capacity is not achieved during this phase. Phase 1 will also reduce the risk of relying on MW1 long-term and will provide aquifer redundancy. In Phase 2, Ultimate Build-Out capacity will be achieved. However, temporary MW3 will be decommissioned, and the associated infrastructure will not be used long-term.

For Staging Scenario 3, a total firm capacity of 24 L/s will be achieved in Phase 1 which allows for growth, however Ultimate Build-Out firm capacity is not achieved during this phase. Phase 1 will also reduce the risk of relying on MW1 long-term and will provide aquifer redundancy. In Phase 2, Ultimate Build-Out capacity will be achieved.

Slide 27: Evaluation Criteria

The three (3) short-listed staging scenarios for the combination of Alternatives 6A and 6B were evaluated based on the criteria shown on Slide 27, which includes:

- **Technical Criteria** - this includes the feasibility of construction, implementation of staging or phasing as the system needs to be expanded, potential impacts to existing utilities, ease of integration with existing infrastructure, site access requirements, odour and noise impacts, operational and maintenance requirements, treatment requirements, water system approvals and monitoring requirements, source water protection, and potential significant drinking water threats and ability to provide aquifer redundancy.
- **Economic Criteria** – this includes the capital costs, operation and maintenance costs, and total lifecycle costs of the staging scenarios.
- **Social Criteria -** this includes consistency with local and provincial policies/planning, property impacts, potential to affect residents, drinking water quality and protection to public health.

- **Cultural Criteria** – this includes potential to affect archaeological resources, to affect First Nations Rights or interests, built heritage resources/features, and cultural heritage landscapes.
- **Natural Environmental Criteria** – this includes effects on wildlife, vegetation, land and aquatic habitats, wetlands or surface water, species at risk, designated natural areas, existing private or local groundwater wells, climate change, and wastewater disposal.

Slide 28: Evaluation Criteria Continued

Each of the evaluation criteria were given a score based on a scoring matrix with values from one (1) to five (5) where:

- The lowest score is one (1) which represents a poor alignment of the staging scenario with the evaluation criteria. This score is also represented by the symbol of a double arrow pointing down.
- The highest score is five (5) which represents a very well aligned staging scenario with the evaluation criteria. This score is also represented by the symbol of a double arrow pointing up.

Slide 29: Summary of Evaluation of Water Supply Alternatives 6A/6B Staging Scenarios

Slides 29 to 33 present a summary of the evaluation of the three (3) staging scenarios for Alternatives 6A and 6B. We will now go through each category at a very high level:

- **Technical** – Staging Scenario 3 was evaluated as the most aligned with the technical criteria overall with a score of four (4) well-aligned, followed by Scenario 2 with a score of three (3) somewhat aligned, and then Scenario 1 with a score of two (2) not well aligned.

  Scenario 3 scored the highest as the development of wells within the Kaitlin Property in Area A is not required. This reduces the construction impact and complexity as existing roads, and services are generally in place. This scenario moderately impacts existing utilities as MW1 is decommissioned during Phase 1. Overall, this is a positive result due to concerns with its long-term viability. Additionally, this scenario provides aquifer redundancy in both Phases 1 and 2.

  Scenario 1 scored the lowest because it does not provide aquifer redundancy as all wells are only in Area A. Similar to Scenario 2, it will require additional water quality monitoring for the nitrates at the Kaitlin Property in Site A. This option has a moderate construction complexity as the majority of roads, services, access points, and so forth, are not in place. This is because the Kaitlin Property has not yet been fully developed. The lack of development has the highest impacts on

site access and movement of large construction vehicles to get to the new well site.

Scenario 2 scored in the middle of the scenarios as it has similar construction complexity and impacts as Scenario 3. However, this alternative does develop wells on the Kaitlin Property in Area A which will require additional water quality monitoring for nitrates.

All scenarios support future expansion of the water supply system, are anticipated to have similar noise and odour impacts, and similar required approvals.

Slide 30: Summary of Evaluation of Water Supply Alternatives 6A/6B Staging Scenarios (Continued)

- **Economic** – Scenario 3 was evaluated as most aligned with the economic criteria receiving an overall score of four (4), well aligned. Scenario 2 was next with a score of three (3), somewhat aligned, followed by Scenario 1 with a score of two (2), not well aligned.

  Scenario 3 had the lowest overall capital costs because less pumping stations and treatment facilities are needed compared to the other scenarios. This scenario also has the lowest operation and maintenance costs because it has fewer pumping stations, there is no need for the addition of nitrate treatment, as no wells are developed on the Kaitlin Property in Area A, and it requires shorter watermain and access road connections as the Park Land and Area C are close to existing infrastructure. Overall, this results in the lowest lifecycle costs of the three scenarios by approximately four to eight million dollars.

  Scenario 2 scored slightly lower due to moderate capital, operation and maintenance costs anticipated for the increased pumping station and treatment infrastructure, and associated nitrate level testing.

  Scenario 1 scored the lowest due to the highest capital costs related to longer access road construction, construction of raw watermains and treated watermain connections to the existing distribution system, and nitrate treatment and testing requirements.

Slide 31: Summary of Evaluation of Water Supply Alternatives 6A/6B Staging Scenarios (Continued)

- **Social -** Scenario 2 was evaluated as the most aligned with the social evaluation criteria receiving an overall score of four (4), well aligned. Scenario 1 and Scenario 3 followed with a score of three (3), somewhat aligned.
- Scenario 2 received the highest score as it has lower anticipated construction and social impacts to existing and future residents. It also has low aesthetic and social impacts anticipated because MW3 would be decommissioned in Phase 2, which is close to the existing houses on Jane Street. Scenario 2 has moderate impacts to farmers due to potential land acquisition for the Species at Risks habitat found in Site C, as no development would be allowed on acquired land, and land maintenance would be required.
- Scenario 1 scored slightly lower than Scenario 2 due to the moderate impact anticipated to acquire the existing farmland for Site A at the Kaitlin Property, and developing new wells and a pumping station at this site. Additionally, MW3 remains online by the existing houses on Jane Street, and a new well in the Park Land will reduce the area available to the public in the future park. Higher long-term aesthetics and social impacts to existing and future residents are anticipated for the MW3 and TW19-1 wells at the Township of Brock Park Land and TW19-3 near Kaitlin Developments. Scenario 1 does not require land compensation for Species at Risk (SARs) habitat and well development in Site C.
- Scenario 3 also scored slightly lower than Scenario 2, due to land acquisition anticipated to be required at Site A and C, and potential land acquisition for the Species at Risks habitat found at Site C. There will be moderate social impacts to farmers as no development will be allowed on acquired land, and land maintenance would be required. As well, there are higher construction and long-term social impacts to existing and future residents at Site A in the Township's Park Land and Site C when the wells are developed.

Slide 32: Summary of Evaluation of Water Supply Alternatives 6A/6B Staging Scenarios (Continued)

- **Cultural** – All scenarios were evaluated as most aligned with the cultural criteria receiving an overall score of four (4), well aligned.

  All scenarios are consistent with local and provincial policies, comply with provincial water quality standards, and have low potential for archaeological interest, based on the results of the Archaeological Assessment. Additionally, no impacts to Indigenous Communities are anticipated for all scenarios. All scenarios were also determined to have no direct adverse impacts on Built

Heritage features/resources, and Cultural Heritage Landscapes based on the results of the Cultural Heritage Assessment.

Slide 33: Summary of Evaluation of Water Supply Alternatives 6A/6B Staging Scenarios (Continued)

- **Natural Environmental** – Staging Scenario 1 was evaluated as most aligned with this criterion receiving an overall score of four (4), well aligned, followed by Scenarios 2 with a score of three (3), somewhat aligned, and Scenario 3 with a score of two (2), not well aligned.

  Staging Scenarios 2 and 3 received a lower score due to the natural environmental impacts anticipated at Area C. The Natural Environmental Impact Assessment completed as part of this study identified that a Species at Risk bird species were present at Area C. These include the Barn Swallow, Eastern Meadowlark, and Bobolink. Any habitat modification in Area C requires land compensation and construction, which can only be completed in certain time windows. While both items are feasible, they do lower the score of Scenarios 2 and 3 compared to Scenario 1, which does not have well development on Area C. Furthermore, there are added complexities with the sanitary disposal methods from pumping stations on Area C as connection to the existing system requires crossing a creek and shallow aquifer. Scenario 2 was rated as slightly more aligned than Scenario 3 because the climate change impacts are anticipated to be lower in Scenario 2 since MW1 is decommissioned in Phase 1 rather than Phase 2.

  In comparison, Scenario 1 has wells only in Area A. In this area there are no Species at Risk, no nearby creeks, or wetlands, or impacts on fish or fish habitat. It is generally already farmland with little vegetation communities of concern.

Based on the ratings for each criterion for the three (3) staging scenarios, overall Staging Scenario 3 was determined to be the most aligned with the evaluation criteria.

Slide 34: Preferred Alternative & Staging Scenario for Water Supply

Based on the evaluation results, a combination of Alternative 6A and 6B with Staging Scenario 3 is the recommended preferred alternative for Water Supply.

As a brief recap, this would include:

- New wells and a pumphouse by TW19-4 (Brock Aggregates Property).
- Transitioning MW3 to a permanent well with a new pumphouse.
- New well by TW19-1, with treatment at the pumphouse by MW3.
- Securing the land by TW19-3 on Kaitlin Corporation's property to be protected for future water supply.

Each well will require connecting watermains to the nearby pumphouse for treatment and access roads to the well. Each pumphouse will require connecting watermains to the distribution system, access roads, security fencing, communication tower(s), standby power generator(s), discharge of treated residuals, etc.

Note that the capacities and the final number of wells drilled in the test well locations may vary and will be confirmed once wells are developed and tested in the future. Additionally, the exact locations of all new infrastructure (e.g., wells, access roads, watermains, etc.) and connection points will be determined during the detailed design stage of the project.

Slide 35: Expanded View of Area C & Staging

Slide 35 shows a closer look at the Area C wells and associated requirements.

- In Staging Step 1A, permanent wells will be developed in Area C. It is estimated that three wells will be required – two duty wells that operate normally, and one standby well which will operate when one of the duty wells is not in service.
- In Staging Step 2B, MW1 will be decommissioned once the new Area C wells are online. MW2 will also be decommissioned at this time, if not completed sooner.

Additionally, the Region will coordinate with Brock Aggregates to secure the property required.

Slide 36: Expanded View of Area A & Staging

Slide 36 shows a closer look at the Area A wells and associated requirements.

- In Staging Step 2A, MW3 will be developed from a temporary well to a permanent well in Area A. A new pumphouse will be constructed to treat both MW3 and the future well developed by TW19-1.
- In Staging Step 2B, a new well will be developed near TW19-1 and treated by the pumphouse next to MW3.

  As part of Stage 2A and 2B, the Region will monitor population growth and water demands to determine the appropriate time to implement the transition of MW3, and the development of a new well at Area A. These could occur at the same time or phased and implemented separately as needed.
- In Staging Step 3, additional well(s) will only be developed in the Kaitlin Property of Area A if additional capacity is required above what is obtained in Phases 1 and 2. Due to the nature of the test and permanent wells, and changing groundwater conditions, actual final well capacities of permanent wells developed in Phases 1 and 2 may vary, change, or deteriorate. As a result, additional wells

may be required to reach the Ultimate Build-Out firm capacity of 31 L/s if the capacity of the wells from Phases 1 and 2 are not sufficient when Ultimate Build-Out is reached.

The Region will coordinate with Kaitlin Corporation to secure and protect the land by Test Well 19-3 in the Kaitlin Area, and the Township of Brock, to secure the property required at the future Park Lands.

Slide 37: Existing Wellhead Protection Map

As part of the Class EA, a Well Head Protection Area (WHPA) and Significant Drinking Water Threats were evaluated for the preferred water supply alternative. Slide 37 shows the existing Well Head Protection Area map for the Sunderland Water Supply system, with MW1 and MW3 in operation.

A Wellhead Protection Area is an area surrounding a municipal well vulnerable to Significant Drinking Water Threats such as pollutants or contaminants. Significant Drinking Water Threats released within the WHPA could reach the municipal well and contaminate the water source.

WHPA-A is the immediate area within a 100-m radius of the municipal well. It is the most vulnerable area in the WHPA, and Significant Drinking Water Threats released here could reach the municipal well very quickly.

If you live or work in a WHPA-A area, there are certain requirements or restrictions to help protect the municipal well from pollutants or contaminants. For example, if you have a septic system in the WHPA-A area, the system will need to be properly maintained and inspected every three years. For fuel storage and chemical handling in the WHPA-A, a Risk Management Plan needs to be in place. Certain agricultural activities may be prohibited.

Significant Drinking Water Threats in the existing WHPA-A include:

- Septic systems managed by inspections every three (3) years.
- Agricultural activities including application of fertilizer, manure, and pesticides on farmland within the Well Head Protection Area. This threat can be managed through a Risk Management plan.

Slide 38: Possible Future WHPA Map

Slide 38 shows the possible future Wellhead Protection Area map. This figure was simulated based on presently available data from pump tests. Modeling shows the conservative outcome for Scenario 3, including future wells in the Kaitlin Corporation Property. However, the preferred scenario only plans to secure the Kaitlin Property as a

future potential water source. The WHPA maps will be reviewed further and refined once the municipal wells are constructed.

For the future possible WHPA map, Significant Drinking Water Threats include:

- Septic systems managed by inspection every three (3) years.
- Agricultural activities including the application of fertilizer, manure and pesticide on farmland managed through a Risk Management plan.
- Commercial activities including storage of solvents and chemicals heavier than water within the employment lands near Highway 12 and Concession Road 6, managed through a Risk Management plan.

Looking at a comparison of the existing WHPA to the potential future WHPA:

- The overall WHPA in Area C is similar in shape and size to the existing WHPA. There is not a significant number of properties new to the WHPA Area and potential restrictions for the new wells at TW-19-4 are close to existing MW1 and MW2.
- The WHPA-A in Area C moves to the East with the construction of the new well(s). Properties specifically in these areas may have stricter requirements than before.
- The overall WHPA in Area A is larger than the existing WHPA when only MW3 was online. The expansion of WHPA in Area C is mainly into agricultural properties which will be developed in the future by Kaitlin Corporation as new subdivisions.
- The WHPA-A in Area A for the potential wells in Park Land or the west side of the Kaitlin Development may restrict future residents and land uses.

Slide 39: Water Storage

That brings us to the end of the Water Supply update for the Class EA. We will now go over the Water Storage update. This next section will discuss the existing water storage system, the storage system's required upgrades, a discussion of the alternatives considered, and a recommendation for Sunderland's Water Storage System.

Slide 40: Existing Water Storage System

The current Municipal Water Storage system servicing the Sunderland urban area consists of an existing water standpipe located on Jane Street, and a distribution system with nine (9) kilometers of watermain. The Sunderland Urban Area is serviced by one pressure zone.

The existing standpipe was built in 1979, and has a total usable storage volume of 0.93 ML. The current storage capacity of this existing standpipe was determined to be insufficient to accommodate the existing Sunderland population, based on the current Ministry of the Environment, Conservation and Parks (or "MECP") design criteria. In addition, the Region experiences operational and maintenance issues including stagnation and freezing due to poor mixing.

The right-hand side of Slide 40 shows a diagram of how the water system works with a standpipe. Ideally, a standpipe is located at a high or the highest elevation in the service area with all the homes at lower elevations. This allows the water stored in the standpipe to flow to each home using gravity, rather than by pumping. For water pressure, the greater the height difference between the water level in the standpipe and the home, the more water pressure is available to that house. For example, a home at the bottom of the hill will have a higher water pressure than a home at the top of the hill.

Water pressure at homes in a service area are typically set within a certain pressure range. The goal is to have a standpipe that provides water at the MECP's acceptable pressure range. For homes at the highest point in the water system that would be 275 kPa (40 psi). For homes at the lowest point in the water system that would be not more than 689 kPa (100 psi). Durham Regions' standard for a maximum pressure of the distribution system is 696 kPa (101) psi at the lowest serviced elevation.

Slide 41: Upgrades Required for the Water Storage System

As a refresher from PIC # 1 and similar to Slide 13, Slide 41 presents the required upgrades to the Sunderland water storage system long-term. As noted in Slide 13, the population of Sunderland may grow as high as 4,372 persons for Ultimate Build-Out, based on the land uses currently approved under the Durham Regional Official Plan.

To accommodate for growth in the community of Sunderland to the "Ultimate Build-Out population, upgrades to the water storage system are required. For the water storage system, the estimated water storage required is 2.0 ML for Ultimate Build-Out. The existing Sunderland standpipe has a total usable storage capacity of 0.93 ML. This would be insufficient storage capacity to meet the Ultimate Build-Out requirement. In addition, the existing standpipe does not have sufficient pressure available to service future service area elevation of 260 m to 290 m. As a result, it was identified that additional water storage of 1.1 ML is needed. A preferred solution including the type and number of new water storage facility, storage location(s), topography, and phasing of the development of the water storage facility would be identified as part of this Class EA.

Slide 42: Water Storage Alternatives

The Preliminary List of Water Storage Alternatives on this slide was presented in PIC # 1. Alternatives 1 to 3 in the first column on the left were: do nothing, limit community growth, and implement water conservation measures. These were not considered further than PIC # 1 as they did not meet the problem and opportunity statement.

Alternative 6 in the third column on the right is not a technically feasible solution and was not considered further, as it does not address the required storage volume to meet the Ministry's guidelines. Alternative 6, included keeping the existing standpipe and supplementing water storage needs with additional pumping. This would include significant modifications to the standpipe to meet the new service pressure requirements.

Alternatives 4 to 5B are possible alternatives, shown in the second column in the middle.

- Alternative 4 considered constructing a new water storage facility at a new location to supplement the existing standpipe.
- Alternative 5A considered constructing a new water storage facility and decommissioning the existing standpipe. The new storage facility would be constructed at the existing standpipe location.
- Alternative 5B considered constructing a new water storage facility and decommissioning the existing standpipe. The new storage facility would be constructed at a new location.

Alternatives 4 to 5B were reviewed further since PIC # 1.

Slide 43: Screening of Short-Listed Water Storage Alternatives

Based on the technical evaluation and known existing conditions and limitation of the existing standpipe, the short-list of water storage alternatives was screened further, as shown on the table on Slide 43.

Alternative 4 to construct a new water storage facility at a new location to supplement the existing standpipe, was not carried forward as a preferred alternative for a long-term water storage. This alternative was evaluated as technically complex to supplement the existing standpipe, due to additional operation and maintenance requirements and operating costs for two water storage facilities. The current service limits of the Sunderland water supply system will also need to be adjusted to provide the required storage at sufficient pressures. Due to the limitations of the existing standpipe, it would be technically complicated to operate the new water storage facility and the existing standpipe at different hydraulic grade lines.

Alternative 5A to construct a new water storage facility at the existing standpipe location, and to decommission the existing standpipe was also not carried forward. The

existing Sunderland water storage has limited space to build a new water storage facility before decommissioning the existing standpipe. As such, construction of this alternative would be technically complex and infeasible.

Alternative 5B to construct a new water storage facility at a new location and to decommission the existing standpipe was determined to be a feasible alternative. Based on technical evaluation, including proximity to the existing distribution system, available locations and topography in the Sunderland urban area and surrounding areas, there are potential locations to construct a new water storage facility. As such, Alternative 5B was carried forward as the preferred alternative for further evaluation.

Slide 44: Types of Water Storage Facilities

Four types of storage technologies were evaluated. They included:

1. **A Standpipe –** A new standpipe would have the same operational issues as the existing standpipe including stagnation and freezing. In addition, Sunderland's low topography would not accommodate the Ultimate Build-Out growth and the system pressures required. As such, a standpipe would not be feasible and was not carried forward.
2. **An Elevated Tank (or "ET") –** An Elevated Tank would provide sufficient storage volume to meet the Ultimate Build-Out demands, while addressing pressure and the hydraulic grade line issues currently experienced with the existing standpipe. An Elevated Tank is a feasible solution and was carried forward.
3. **An In-ground Gravity Reservoir (i.e., at high elevation) –** Due to Sunderland's low topography, the inground reservoir would not be feasible as water from the reservoir would not flow by gravity to the homes and provide the required pressures. This option was not carried forward.
4. **A Booster Pumping Station & In-ground tank –** an in-ground reservoir with a booster pumping station would provide the required storage and pressures to the Sunderland system. However, the footprint of the reservoir would be much larger than the base of an elevated tank pedestal, resulting in higher excavation costs and potential for groundwater impacts during design and construction. The booster pumping station adds a second pumping point within the system, in addition to the various groundwater wells, increasing the system's operational complexity and maintenance requirements. Overall, while this option is feasible, it was not carried forward as it would be more expensive and have higher operational and maintenance impacts than other options.

This screening approach allowed the Project Team to develop a preliminary list of locations for a new Elevated Tank for further screening and evaluation.

Slide 45: Storage Options

Slide 45 shows a map of the overall potential areas that were reviewed and screened as the new Water Storage Facility location. These potential areas for the new Water Storage Facility were screened out based on:

- **Topography** – Locations where the topography was too low for the required height of the new water storage facility to achieve sufficient water pressures in the service area.
- **Land Use** – Locations that are forested, part of natural heritage systems, existing residential zones, recreational facilities, commercial uses, or areas with existing infrastructure which would interfere with water storage such as a communication tower.
- **Distance** – Locations too far from urban settlements and the existing regional distribution system. The further the distance a water storage facility is from the distribution system, the higher the overall costs would be due to the increased infrastructure required to connect the elevated tank to the existing system.
- **Watermain Redundancy** – Locations with a single watermain path from the water storage facility to the service area will not provide watermain redundancy during failure of watermain paths.
- **Space Limitations** – Locations already densely populated with residential or commercial buildings, which have insufficient land space available for a new water storage facility and construction scaffolding.

Based on the screening and evaluation presented, multiple location options in the Sunderland Urban Area and surrounding areas were further screened, and a shortlist of three (3) location options were carried forward for a detailed evaluation. The map on the right-hand side of this slide shows three (3) potential options for the location of a new elevated tank as follows:

1. **Storage Location Option 1: Township of Brock's Park Land**
2. **Storage Location Option 2**: **North Kaitlin Development**
3. **Storage Location Option 3**: **West Kaitlin Development**

Slide 46: Location Option 1: Township of Brock's Park Land

Storage Location Option 1 is located in the Township of Brock's Park Land, within the Sunderland urban area. The property is owned by the Township of Brock and is currently zoned as recreational. This area has adequate space for a new elevated tank (ET) and associated infrastructure, including connection to a nearby stormwater management pond for occasional draining of the tank for maintenance, and is in

proximity to the existing standpipe, existing regional distribution main and surrounded by residential areas. Compared to the other locations, this area is at a slightly lower elevation, resulting in increased tank costs.

Slide 47: Location Option 2: North Side of Kaitlin Development

Storage Location Option 2 is located in the North Kaitlin Development area, outside of the Sunderland urban area. The property is owned by the Kaitlin Development and is currently zoned as development. This area has adequate space for a new elevated tank and associated infrastructure, such as stormwater connection to a nearby stormwater management pond. The tank can be drained for maintenance and will be close to future residential areas. However, this location is further from the existing regional distribution system and urban settlement area, and the overall costs for connecting infrastructure would be higher than Option 1. A longer paved access road to the ET would also be required adding to the costs, and construction impacts to the Kaitlin Development area.

Slide 48: Option 3: West Side of Kaitlin Development

Similar to Option 2, this option is located in the West Kaitlin Development area, outside the Sunderland urban area. The property is owned by the Kaitlin Development and is currently zoned as rural buffer. This area has adequate space for a new elevated tank and associated infrastructure, such as stormwater connection to a nearby stormwater management pond for when the tank is drained for maintenance. It will also be close to future residential areas. However, this location is further from the existing regional distribution main, and the overall costs would be higher compared to Option 1. A longer paved access road to the ET would also be required adding to the costs, and construction impacts to the Kaitlin Development area.

Slide 49: Evaluation Criteria

The three (3) short listed alternatives were further evaluated based on the criteria shown on Slide 49, which includes:

1. **Technical Criteria** - this includes location topography, construction feasibility, ease of implementation and staging, potential impacts to existing utilities, the compatibility of the alternative with the existing systems, ease of integration with existing and planned infrastructure, site access requirements, effects on operations and maintenance, system redundancy, and water storage approvals and requirements.
2. **Economic Criteria** – this includes the life cycle costs of the new elevated tank and associated infrastructure. The life cycle cost considers the estimated capital

cost, operation and maintenance costs. This also considers the sustainability and affordability of the alternative.

3. **Social Criteria -** this includes consistency with local and provincial policies/planning, property impacts, potential to affect residents, drinking water quality and protection to public health.
4. **Cultural Criteria** – this includes potential to affect archaeological resources, to affect First Nations Rights or interests, built heritage resources/features, and cultural heritage landscapes.
5. **Natural Environmental Criteria** – this includes effects on fish or aquatic habitats, wetlands or surface water, vegetation, terrestrial habitats, Species at Risk and/or significant wildlife habitat, designated natural areas of scientific interest, climate change, and wastewater disposal.

Slide 50: Evaluation Criteria Continued

As presented in Slide 50, each evaluation criteria were given a range of scores based on a scoring matrix with values from one (1) to five (5) where:

- The lowest score is one (1) representing a poor alignment of the staging scenario with the evaluation criteria. This score is also represented by the symbol of a double arrow pointing down.
- The highest score is five (5) representing a very well aligned staging scenario with the evaluation criteria. This score is represented by the symbol of a double arrow pointing up.

Slide 51: Summary of Evaluation of Water Storage Location Options for Alternative 5B (New ET)

Slides 51 to 55 present a summary of the evaluation of the three (3) storage location options for Alternative 5B. For each evaluation criteria (social, economic, technical, etc.), each option was given a rating from highest impact to lowest impact based on the scoring matrix shown on Slide 50.

We will now go through each category at a very high level:

1. **Technical** – Storage Location Option 1 was evaluated to be the most aligned with the technical criteria overall with a score of five (5), well aligned. Storage Options 2 and 3 tied with a score of three (3), somewhat aligned.

   Location 1 scored the highest as there is sufficient space to construct a new ET, and it has the associated infrastructure within the Sunderland urban area. This

option has lower construction impacts as existing roads and services are generally all in place. There are multiple points of connection available to the existing watermain system, providing redundancy if a section of watermain breaks. Minor temporary impacts to local traffic are anticipated during construction. This location also has low complexity of integration. It is in proximity to the regional distribution main, sanitary infrastructure (i.e., stormwater management pond or sanitary connection), has adequate space for the ET and has the associated infrastructure to perform maintenance. There is also the ability to connect to existing electrical and utilities services. A preliminary geotechnical and hydrogeological investigation was completed for Option 1 and confirmed feasibility; however, additional structural supports/foundation will be required to construct a new ET due to sand/silt soil material.

Options 2 and 3 both scored the lowest as they have a higher complexity of integration. This is because they require longer connections to existing distribution mains, and they require extensions of electrical and utility servicing. These options also would not provide watermain redundancy in the case of a transmission main failure, because they are not near the existing watermain system. Since the Kaitlin Property has not yet been developed, both options have higher construction complexities. The majority of the roads, services, access points, etc. are not yet in place. These options make it harder for large construction vehicles to access the site where the ET would be built.

All scenarios support future expansion of the water storage system, have similar operation and maintenance requirements, minimal impacts to the existing standpipe operations until the new ET is constructed, and similar approvals are anticipated to be required.

Slide 52: Summary of Evaluation of Water Storage Location Options for Alternative 5B (New ET) Continued

2. **Economic** – Location Option 1 was evaluated to be the most aligned with this criterion with an overall score of four (4), well aligned, followed by Option 2 with an overall score of three (3), somewhat aligned, and Option 3 with an overall score of two (2), not well aligned.

   Location Option 1 has the lowest capital costs based on the lower costs anticipated for land acquisition, and the lower costs for watermain and access roads compared to the other two alternatives. All three alternatives would have similar operation and maintenance costs.

Slide 53: Summary of Evaluation of Water Storage Location Options for Alternative 5B (New ET) Continued

3. **Social** – Location Option 2 was evaluated to be the most aligned with this criterion with an overall score of four (4), well aligned, followed by both Location Options 1 and 3 which each received a score of three (3), somewhat aligned.

   All location options are consistent with local and provincial policies and comply with provincial water quality standards.

   Option 2 scored higher than the other options due to lower anticipated construction impacts to existing residents, and moderate aesthetic and social impacts anticipated to future surrounding residents at the North Kaitlin Development. This location is outside the Sunderland urban boundary; however, it is in close proximity to the urban boundary. Land acquisition would be required, however there would be no impacts to farmlands. Rezoning would be required as the property is owned by the Kaitlin Development and is currently zoned as development.

   Option 1 scored slightly lower than Option 2 due to moderate social and aesthetics impacts. These impacts include the acquisition of the Township of Brock's Park Land for the construction and operation of the new ET; temporary visual, noise, and traffic impacts during construction in residential areas; and the long-term visual impacts of the ET on the residents who are used to having the standpipe nearby instead. This location is within the Sunderland urban boundary. Rezoning will be required as the property is owned by the Township of Brock and is currently zoned as recreational.

   Option 3 scored slightly lower than Option 2 because it would require land acquisition from existing farmland. Similar to Option 2, this option has lower anticipated construction impacts to existing residents, and moderate aesthetic and social impacts are anticipated for future surrounding residents at the North Kaitlin Development. This location is outside the Sunderland urban boundary; however, it is in close proximity to the urban boundary. Rezoning will be required as the property is owned by the Township of Brock and is currently zoned as recreational.

Slide 54: Summary of Evaluation of Water Storage Location Options for Alternative 5B (New ET) Continued

Cultural – All three location options were evaluated to be the most aligned with this evaluation criteria with an overall score of four (4), well aligned. All location options were also determined to have no direct adverse impacts on Built Heritage resources/features and Cultural Heritage Landscapes based on the results of the Cultural Heritage Assessment.

Options 1 and 2 have low potential for archaeological interest based on the results of the Archaeological Assessment. Option 3 may have potential for archeological interest as no Archeological Assessment has been completed for this location. If this option is preferred, an Archeological Impact Investigation is required. Additionally, no impacts to Indigenous Communities are anticipated for all scenarios.

Slide 55: Summary of Evaluation of Water Storage Location Options for Alternative 5B (New ET) Continued

- **Environmental** – All three storage location options were evaluated to be equally aligned with this criterion with an overall score of four (4), well aligned. These areas have no Species at Risk, no nearby creeks, or wetlands, so there are no anticipated impacts to fish or fish habitat, wildlife and wildlife habitat, and they are generally already farmland and/or urban settlement areas with little vegetation communities of concern. There are also no anticipated impacts to carbon sinks, greenhouse gasses, and flood plains. Options 1, 2 and 3 would require a stormwater management connection to a nearby stormwater management pond.

Based on the ratings for each of the criterion of the three (3) alternatives discussed, Option 1 was determined to have the lowest construction and implementation complexity, and the lowest capital costs, while having similar or lessor social, aesthetic, technical, archaeological, and environmental impacts compared to Options 2 and 3. As such, Storage Location Option 1 is recommended as the preferred location for the new Sunderland Elevated Tank.

Slide 56: Preferred Alternative & Staging for Water Storage

The Figure on the right side of Slide 56 shows the overall recommended solution for the new Sunderland Elevated Tank (at Storage Location Option 1). This includes:

1. A new elevated tank being constructed on the Township of Brock's Park Land to the west of the existing Sunderland Standpipe.
2. A new watermain from the elevated tank connecting it to the existing local watermain to provide treated water to the local water system.
3. An easement towards Jane Street, and an easement towards the North Kaitlin Development area will be required to connect the tank to a nearby stormwater management pond, and to provide an access road to the elevated tank and wells. The new tank would be approximately 45 m tall, above the ground level.
4. Various other site amenities such as site security fencing, a communications antenna, a standby power generator, etc.

Once the new elevated tank is constructed and operational, the existing Sunderland Standpipe will be decommissioned.

Slide 57: Artistic Rendering of Recommended Location for New Elevated Tank

Slide 57 shows one (1) rendering of the new elevated Tank at the recommended location of 1 Jane Street. View 1 is the “before” view of the existing Sunderland Standpipe along 1 Jane Street looking North-West towards the Township of Brock’s Park Land. View 2 is the “after” view of the new Sunderland Elevated Tank along 1 Jane Street looking North-West towards the Township of Brock’s Park Land.

Slide 58: Next Steps

This brings us to the end of the Water Storage update for the Class EA. We will now present the Next Steps for this Class EA.

Slide 59: Project Schedule

Shown on Slide 59 is the project schedule, this Schedule “B” Class EA is required to follow the Phase 1 and 2 of the Municipal Class EA process. The next steps for the Project Team will be to:

1. Review and consider public input and comments received after this PIC.
2. Prepare the Class Environmental Assessment Project File Report summarizing the entire study results.
3. Issue a Notice of Study Completion and publish the Project File Report on the public record for a final public review period of 30 days.
4. Finally, review any further comments from the community during the 30-day review period and complete the Class Environmental Assessment process.

Once the Class EA process has been completed, the Region of Durham will begin the conceptual design of the water supply and storage alternatives. This includes completing the topographic survey of the sites and undertaking geotechnical and/or hydrogeological investigations for the preferred locations of the new water supply and water storage alternatives. Detailed design and construction of the new wells and associated pumphouses, and of the new elevated tank and associated system improvements will then follow.

Slide 60: Opportunities for Public Input

In terms of the anticipated timeline, we ask that any comments or questions about this PIC, and the material presented be submitted to the Project Team by October 27, 2021, which is four (4) weeks from when this virtual PIC was posted online. We anticipate that the Notice of Study Completion and the Project File Report will be available for your review in late 2021.

Slide 61: How to Provide Feedback

If you have any questions or comments for the Project Team, please reach out to the Project Team members by email or phone. A reminder that the PIC material including the presentation and transcript can be found on the project website at **durham.ca/SunderlandWaterSystem.** Previous information on the project can also be found here as well.

Slide 62: Thank you for your time!

Thank you for taking the time to attend this PIC. We appreciate your involvement and feedback on this project and encourage you to reach out to the Project Team by contacting us by email or phone.

Best wishes and we hope to hear from you soon!