CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Hamilton Water Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	November 18, 2024
SUBJECT/REPORT NO:	Carlisle Water Storage Municipal Class Environmental Assessment and Conceptual Design (PW24076) (Ward 15)
WARD(S) AFFECTED:	Ward 15
PREPARED BY:	Justin Wilson (905) 546-2424 Ext. 5471
SUBMITTED BY: **SIGNATURE:**	Cari Vanderperk Director, Watershed Management Public Works Department 

RECOMMENDATION

(a) That the General Manager, Public Works Department be authorized and directed to file a Notice of Completion and Exemption from the Municipal Class Environmental Assessment process for the Carlisle Water Supply System; and,

(b) That the Hamilton Water Division proceed with the implementation of the preferred alternative of a larger elevated water tank in Tower Park for the Carlisle Water Supply System with an estimated detailed design and construction cost of $11M under Project ID 5141895852 Carlisle Water Supply System - Additional Water Storage.

EXECUTIVE SUMMARY

The City of Hamilton (City) retained R.V. Anderson Associates Limited to complete a Schedule ‘B’ Municipal Class Environmental Assessment (Environmental Assessment) and Conceptual Design for a water storage facility in the Carlisle Rural Settlement Area. The Environmental Assessment was later reclassified as Exempt based on the latest guidance within the Municipal Engineers Association Municipal Class Environmental Assessment document for Schedule B projects (2023).

The Carlisle communal water system has historically experienced high per capita water demands during the summer, exceeding Ministry of Environment, Conservation and

Parks (Ministry of the Environment) Design Guideline standards. A long-term comprehensive water conservation program was undertaken between 2015 and 2019 and it was determined that conservation measures alone could not eliminate the need for additional water storage. The storage capacity of the existing elevated tank is 1,400 cubic metres (m^3) and an additional 689 m^3 (or 49%) of capacity is required to meet the current population demand based on the need for firefighting storage, equalization storage (needed to meet minimum pressure requirements), and emergency storage. To meet future population demands (2051), additional total storage of 1,271 m^3 (or 91%) more capacity is required based on all remaining undeveloped lands (14 parcels) being built and connected to the municipal system and the connection of the remaining households on private wells to the municipal system. Given the existing storage deficit in Carlisle, the Problem and Opportunity Statement for the Environmental Assessment was identified as:

- Additional water storage infrastructure is required within the Community of Carlisle to address the community's water storage capacity needs now, and in the future.

This Environment Assessment identified and evaluated:

- alternative sites for the required water storage infrastructure, and
- alternative types of water storage facilities.

A total of eight alternative locations were identified for the new water storage infrastructure. This long-list of locations was then assessed based on screening criteria developed by the Project Team and in consideration of comments received from technical agencies, key partners, and the public. Through this screening process, two locations were shortlisted for further evaluation. After a detailed evaluation of the shortlisted locations, the preferred location was determined to be 40-46 Woodend Drive, Carlisle (Tower Park), where the existing elevated tank is located.

A total of nine alternative water storage infrastructure types were considered. The alternatives consisted of Do Nothing (required to be evaluated as per the Environmental Assessment process), an elevated tank, a standpipe, an in-ground water reservoir, and an above ground reservoir. Each water storage system could either replace or complement the existing elevated tank. After evaluating the various water storage infrastructure types, it was determined that a new, larger elevated tank to replace the existing elevated tank was the preferred water storage solution. Therefore, the preferred solution is to construct a new larger elevated tank within Tower Park.

Public, technical agencies, First Nations, and other partner consultations were completed in accordance with the requirements of the Municipal Engineers Association Municipal Class Environmental Assessment document for Schedule B projects (2023)

and City protocols through Public Information Centres, mail-outs, and a project website. The Ward 15 Councillor was also consulted.

The approval of this recommendation report will support the continued path towards detailed design and construction of the preferred infrastructure solution. Since the project is now exempt from the Environmental Assessment process, the project will be added to the City website for public review and a notification will be sent to all partners, but no mandatory public or technical review period will occur.

Alternatives for Consideration – See Page 12

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The preferred solution of a new larger elevated tank within Tower Park has an estimated detailed design and construction cost of $11M. The $11M of capital funds will be included in the recommended 2025 Water, Wastewater, and Stormwater Rate Capital Budget under Project ID 5141895852 Carlisle Water Supply System - Additional Water Storage.

Staffing: N/A

Legal: N/A

HISTORICAL BACKGROUND

The Carlisle Rural Settlement Area is serviced primarily (73% of households) through four municipal groundwater production wells with the remainder being serviced by private wells (27% of households). Storage for the municipal water system is provided by an elevated tower with a capacity of 1,400 cubic metres (m^3).

The Carlisle municipal water system has historically experienced high per capita water demands during the summer, exceeding Ministry of the Environment Design Guideline standards. In the summer of 2002, the municipal water system was unable to meet peak demands. This event resulted in a mandatory total outdoor watering ban for a period of time. Alternating watering days continue to be in place as a standard requirement, and additional watering bans are implemented as required.

The City initiated an Environmental Assessment in 2012 to evaluate options for improving water service delivery through infrastructure solutions. To support the report, the existing storage requirements for the Carlisle Water Supply System were assessed using the Ministry of the Environment Design Guidelines which include firefighting, emergency, and equalization storage. These calculations suggested that additional municipal well capacity was not required if wells were used at 90% capacity over the

long term, assuming complete build-out and gradual transfer of all private well users (27% of households) to the municipal system. However, additional water storage capacity was required to satisfy the long-term needs of the community.

Even though it was determined that additional water storage capacity was required, the 2012 Environmental Assessment was terminated in 2014 to determine whether a five-year comprehensive water conservation program (2015 to 2019) could eliminate the need for additional water storage in the community. While community efforts were notable, demand was not consistently below the threshold necessary to eliminate the need for additional water storage. As such, the community continues to require additional water storage capacity to meet the demand for fire flow, complete build-out and the gradual transfer of the remainder of existing private well supply users to the municipal system.

The current study was completed as a Schedule B Environmental Assessment to determine a water storage solution for the community of Carlisle. The Environmental Assessment for this project included public, Indigenous, and technical agency consultation, an evaluation of alternatives to determine a recommended solution, and a conceptual design. Upon completion of the study, the Carlisle Water Storage Study Project File Report (can be found at https://www.hamilton.ca/environmental-assessments/carlisle-water-storage-facility#project-file-report) documenting the planning and decision-making process and preferred alternative was prepared. This report, although exempt from the formal mandatory public or technical review process, is ready for review by all partners. Pending approval of the recommendations in Report PW24076, a separate advertisement will be issued to advise the public and partners of the Notice of Completion and Exemption of the project from the Environmental Assessment process.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The recommendations in Report PW24076 are consistent with the Rural Hamilton Official Plan. Other policies and legislation affecting or impacting Report PW24076 include:

- *Ontario Environmental Assessment Act*
- Ministry of Environment Design Guidelines for Drinking Water Systems, 2008
- *Safe Drinking Water Act, 2002*
- *Municipal Act, 2001*
- Provincial Policy Statement, 2020

RELEVANT CONSULTATION

The Ward 15 Councillor has been advised about the completion of the study and the recommendation of the Carlisle Water Storage Study Project File Report. Public, Indigenous, and technical agency consultation is an integral and legislated component of any Environmental Assessment study. Through local newspaper notices and direct mailings (paper and electronic), various Indigenous communities, government agencies, authorities, and interest groups were informed of the Environmental Assessment Study Commencement, Public Information Centres, and pending Notice of Study Completion and Exemption status. Notices were distributed to property owners in the Rural Settlement Area, as well.

Project partner and review agencies lists are developed at the onset of the study and maintained throughout, thus ensuring all interested parties are kept informed. All partners are invited and encouraged to comment on the project during the study. A complete list of technical agencies, special interest groups, and Indigenous communities that were contacted as part of the study has been documented in the Consultation Log in the Carlisle Water Storage Study Project File Report.

Key opportunities for residents of the Carlisle community and the public to provide input to the study included two virtual Public Information Centres, two online surveys, and comment forms on the project website as described below:

- The Notice of Study Commencement and Public Information Centre #1 was published on June 1 and 8, 2023, in the Flamborough Review and mailed to residents in the Carlisle Rural Settlement Area. Technical agencies and Indigenous communities were sent the notice via email. The notice was also published to the City's project website at https://www.engage.hamilton.ca/carlislewaterstorage and advertised through the City's social media channels. The notice advised that the City was undertaking a study to consider infrastructure options to address Carlisle's long-term water demands and storage needs and that the project was a Schedule B Environmental Assessment, with the first Public Information Centre being held on June 14, 2023, through a Virtual Public Meeting format hosted on Microsoft Teams accessible online or by phone.

- The Notice of Public Information Centre #2 was published in the Hamilton Spectator and mailed to residents in the Carlisle Rural Settlement Area. Technical agencies and Indigenous communities were sent the notice via email. The notice was also published to the City's project website and advertised through the City's social media channels. The notice advised that the second Public Information Centre was being held on April 25, 2024, through a Virtual Public Meeting format hosted on Microsoft Teams accessible online or by phone.

- Following the Public Information Centre events, presentation materials, including presentation recordings, were made available on the project webpage. The Public was able to submit comments after each Public Information Centre for a period of two weeks, via a survey published on the City's Engage Hamilton website. Question and answers that were raised during the Public Information Centre events were added to the Frequently Asked Question section on the City's project website. Additional comments were also received via email throughout the study period and a summary of these have been included in the Carlisle Water Storage Study Project File Report.

Key feedback from Indigenous partners and review agencies to date is summarized as follows:

Indigenous Partners:

- The Haudenosaunee Confederacy, the Huron Wendat Nation, the Six Nations of the Grand River, the Mississaugas of the Credit First Nation, and the Metis Nation of Ontario were kept informed throughout the Environmental Assessment. The Huron Wendat Nation and the Mississaugas of the Credit First Nation provided response on the Stage One Archaeological Assessment indicating that the results from the study were satisfactory and that they would like to be involved in any Stage Two Archaeological Assessment. No further comments were received.

Ministry of the Environment:

- For the construction of a new water storage facility, the Ministry of the Environment acknowledged that a Schedule B Environmental Assessment process was being undertaken under the Municipal Engineers Association Municipal Class Environmental Assessment document for Schedule B projects (2023) in order to identify, evaluate and determine the preferred alternative for addressing water servicing issues in Carlisle. The Ministry of the Environment delegated the procedural aspects of rights-based Indigenous consultation to the City and provided a list of Indigenous communities to consult with. The Ministry of the Environment's Areas of Interest in Relation to the study included: Planning and Policy; Source Water Protection; Climate Change; Air Quality, Dust and Noise; Ecosystem Protection and Restoration; Species at Risk; Surface Water; Groundwater; Excess Materials Management; Contaminated Sites; Servicing, Utilities and Facilities; Mitigation and Monitoring; and Consultation. The Ministry of the Environment also provided a Client's Guide to Preliminary Screening for Species at Risk.

Ministry of Citizenship and Multiculturalism:

- The Ministry of Citizenship and Multiculturalism requires that if the Environmental Assessment project area exhibits archaeological potential, then an

archaeological assessment shall be undertaken by an archaeologist licensed under the *Ontario Heritage Act*, who is responsible for submitting the report directly to Ministry of Citizenship and Multiculturalism for review. If there is potential for built heritage resources and/or cultural heritage landscapes within the project area, then a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment should be undertaken for the entire study area during the planning phase and summarized in the Environmental Assessment report. A Stage One Archaeological Assessment and a Cultural Heritage Report were completed as part of the Environmental Assessment study.

Conservation Halton:

- Conservation Halton provided feedback for multiple locations listed as alternative sites. However, there was no specific concern with the location of the preferred alternative site.

The recommendations in Report PW24076 are part of the final stage of consultation which is an inherent part of the Environmental Assessment process. If necessary, the Project Team will receive and attempt to mitigate all partner concerns or requests.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

By applying the Environmental Assessment process, the project followed the legislated multi-phased analysis rationale. Specifically, the narrative of this study is summarized in the text below. Detailed documentation is in the Carlisle Water Storage Study Project File Report.

The Environmental Assessment Problem/Opportunity Statement was identified as follows:

- Additional water storage infrastructure is required within the Community of Carlisle to address the community's water storage capacity needs now, and in the future.

The objectives of the Schedule B Environmental Assessment project were to review and compare alternative solutions to address the Problem/Opportunity Statement, to address and incorporate partner feedback and to identify the preferred solution.

All reasonable alternative locations that met the requirements of the Problem/Opportunity Statement were identified. The following is the list of potential sites for the water storage infrastructure that were screened against pass or fail criteria to confirm feasibility before proceeding to a detailed evaluation of a shortlist of alternative sites:

Alternative Sites for Water Storage	Description
Area #1 – Existing Elevated Tank Site, 40 - 46 Woodend Drive (Tower Park)	• Considered as a short-listed site, • Located on City owned property, • Close proximity to existing storage facility and infrastructure, • Open space available, • No local hazards; and, • Adequate pressure and fire flows.
Area #2 – William Street, 1535 Centre Road	• Considered as a short-listed site, • Located on private property, • A watermain extension would be required, • Open space available, • No local hazards; and, • Adequate pressure and fire flows.
Area #3 – Baseball Diamonds, 1496 Centre Road	• No longer considered as does not meet the Recreation Master Plan and would have negative social impacts.
Area #4 – Tennis Court, 1496 Centre Road	• No longer considered as does not meet the Recreation Master Plan and would have negative social impacts. The Community Centre septic tile bed is in this area.
Area #5 – South of Carlisle Road, 302 Carlisle Road	• No longer considered due to Conservation Halton identification that the area is in a flood plain hazard, meander belt hazard, wetland hazard, and stable top of bank hazard associated with the property being adjacent to a river/stream.
Area #6 – Centre Road (no address)	• No longer considered due to concerns with the lower elevation of the property, which would require larger infrastructure and equipment to meet the hydraulic grade line.
Area #7 – Palomino Park, 6 Oldenburg Road	• No longer considered due to the requirement to remove a forested, natural heritage feature area for construction, including being adjacent to a hazardous area.

Alternative Sites for Water Storage	Description
Area #8 – Carlisle Memorial Park, 1487 Centre Road	• No longer considered as does not meet the Recreation Master Plan and would have negative social impacts (loss of a community park).

Based on the evaluation of the long list of alternatives above, the following two locations were recommended to be carried forward for further assessment:

- Area 1: Tower Park (40-46 Woodend Drive)
- Area 2: William Street (1535 Centre Road)

From the shortlisted alternative locations, more detailed evaluation criteria were established by the Project Team and multiple technical studies were commissioned to inform the selection of a preferred location and type of water storage system. The following reports were completed, and summary of their findings can be found in the Carlisle Water Storage Study Project File Report:

- Hydraulic Modelling Analysis,
- Geotechnical and Hydrogeological Assessment,
- Natural Environment Assessment,
- Archaeological and Cultural Heritage Environment Assessment; and,
- Phase One Environmental Site Assessment.

All reasonable solutions to the problem were identified and described, including the Do Nothing alternative. After general inventories of the technical, natural, social, cultural, and economic environments were prepared and potential environmental impacts were determined for each alternative, the net positive and negative effects were identified, and the alternatives were evaluated resulting in a recommended solution. The recommended solution was then presented to the public, partners, and agencies to solicit input into the selection of the preferred solution.

The recommended location for the future water storage facility was Area one, the existing elevated tank Site, 40-46 Woodend Drive in Tower Park. This was the preferred location as there is an existing driveway access and pipe network on the property. The property is owned by the City, which was generally preferable to purchasing private property, and reduces costs associated with acquiring land. Tower Park is located on higher ground and therefore meets the hydraulic (water pressure) requirements. Tower Park is in an urban area on a disturbed site, thus reducing impacts to the natural

environment. Additionally, there are lower construction costs with this location in comparison to the Area two: William Street (1535 Centre Road) location.

The following is the list of water storage system alternatives considered to improve the Carlisle Rural Settlement Area's Water Supply System:

Alternatives for Water Storage	Description
Alternative 1 – Do nothing approach	• No longer considered as does not meet the Problem and Opportunity statement. • Water demands would not be met for the current population or the planned additional growth in the community.
Alternative 2 and 3 – Elevated tank (replace with new tank [Alternative 2] or add an additional new tank [Alternative 3])	• An elevated tank is supported by a tower, storing water at an elevation to increase water pressure. • A new elevated tank, assuming full replacement (Alternative 2), would be approximately the same height (49 m) and slightly wider (20 m) than the existing elevated tank. • Alternative 3 was no longer considered as the community was not supportive of having two water towers on the same site.
Alternative 4 and 5 – Standpipe (replace with new standpipe [Alternative 4] or add an additional new standpipe [Alternative 5])	• A standpipe is a tall tank for storing water, usually smaller in diameter compared to its height. • A new standpipe, assuming full replacement (Alternative 4), would be approximately 49 m in height and 17 m in width. • Alternatives 4 and 5 were no longer considered because they require more operations and maintenance and do not provide the flexibility during power outages in comparison to elevated tanks.
Alternative 6 and 7 – In-ground reservoir (replace with new reservoir [Alternative 6] or add an additional new reservoir [Alternative 7])	• An in-ground reservoir consists of an underground compartment used to accumulate water from an external water treatment unit and requires pumps to distribute water. • The size of a new underground reservoir, considering full replacement (Alternative 6), would be approximately 20.5 m wide and 8.5 m

Alternatives for Water Storage	Description
	tall with a pumping station approximately 8 m (width) by 8 m (height). • Alternatives 6 and 7 were no longer considered because they require more operations and maintenance, as they require pumps to distribute water. This could impact the operational reliability and increase the electricity usage to operate the pumps.
Alternative 8 and 9 – Above ground reservoir (replace with new reservoir [Alternative 8] or add an additional new reservoir [Alternative 9])	• An above ground reservoir consists of an above ground compartment used to accumulate water from an external water treatment unit and requires pumps to distribute water. • The size of the new above ground reservoir, considering full replacement (Alternative 8), would be similar to the in-ground reservoir, approximately 8.5 m tall and 20.5 m wide. The pump station would be approximately 8 m wide and 8 m tall. • Alternatives 8 and 9 were no longer considered because they require more operations and maintenance, as they require pumps to distribute water. This could impact the operational reliability and increase the electricity usage to operate the pumps. The above ground reservoir also requires a larger environmental footprint than the other alternatives listed above.

The evaluation of the nine alternative water storage system solutions to address water demands and storage needs in the Carlisle Rural Settlement Area used the same evaluation criteria that was used to determine the preferred location. The evaluation process scored the technical, natural, social, cultural, economic, and potential environmental impacts and determined which alternative had the greatest net positive effects. Once all alternatives were evaluated, a recommended solution was determined.

The preferred water storage system solution was Alternative 2: New Elevated Tank to Replace the Existing Elevated Tank. The new elevated tank would be approximately the same height (49 m high) and slightly wider (20 m wide) than the existing and would operate in a similar function (i.e., using gravity to distribute water). The new elevated tank would also have a similar environmental footprint to the existing tank. Once the new tank is constructed, the old tank could be replaced with green space. The approximate capital cost of this solution is $11M funded in Project ID 5141895852 -

Carlisle Water Supply System - Additional Water Storage. This solution would also have reduced operation and maintenance costs in comparison to other alternatives. Mitigation measures for any negative environmental impact of the preferred alternative have been identified and become conditions of the implementation phase of the Environmental Assessment. Detailed mitigation measures are included in the Carlisle Water Storage Study Project File Report.

Since the preferred solution is to construct a slightly larger elevated tank to replace the existing elevated tank at the same location (i.e., Tower Park), it was determined that the Study should be downgraded from Schedule B to Exempt from the Environmental Assessment process as per the 2023 amendment (Municipal Class Environmental Assessment 2023). The exemption is a result of the preferred solution not requiring any land acquisition and the minimal impact on the natural and socio-economic environment. The final step in the analysis rationale before proceeding to implementation of the preferred alternative would generally be to undertake the mandatory 30-day public and technical review. However, since the project is exempt, a Notice of Completion and Exemption of the Environmental Assessment will be issued to all partners as recommended herein following the approval of the recommendations in Report PW24076. Notices will be issued via newspaper advertising and/or direct mail out to all members of the public, Indigenous partners, and technical agencies. The Carlisle Water Storage Study Project File Report will be added to the Engage Hamilton website along with contact information to receive concerns. All attempts will be made to mitigate any/all expressed concerns.

The project was completed and considered to be in full compliance with the Environmental Assessment process.

ALTERNATIVES FOR CONSIDERATION

The recommended alternative solution has been identified using an evaluation and screening process that fulfils the requirements under the Municipal Engineers Association Municipal Class Environmental Assessment document for Schedule B projects (2023).

Since the Carlisle Water Storage Environmental Assessment and Conceptual Design is now exempt, there will be no filing of the project with the provincial government. Should Council not wish to approve and move forward with the project, then the Hamilton Water Division would not proceed to detailed design and construction. The outcome would be equivalent to the Do Nothing alternative, which will result in the risk of insufficient firefighting flows, insufficient water storage, and drinking water shortages, along with the erosion of public trust with the City’s drinking water system.

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: N/A

Staffing: N/A

Legal: N/A

APPENDICES AND SCHEDULES ATTACHED

N/A