



**REPORT TO:** Reeve Bailey and Members of Council  
**PREPARED BY:** Sean McGhee, Director of Public Works  
**DATE:** 17/06/2019  
**SUBJECT:** Wingham Standpipe Options  
**ATTACHMENTS:** [Click here to enter text.](#)

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## **RECOMMENDATION:**

**THAT** the Council of the Township of North Huron hereby receive the report of the Director of Public Works, dated June 17, 2019 regarding the replacement of the Wingham Standpipe for information;

**AND FURTHER THAT**, staff be authorized to proceed with the development of a detailed workplan and the investigation of funding options for the construction of a replacement standpipe on the existing site through the Master Servicing Plan project.

## **EXECUTIVE SUMMARY**

The Wingham Standpipe was constructed in 1974 by the Canada Gunitite Company with major reconstruction and repairs taking place in 1984.

In 2015, RJ Burnside was contracted to complete an audit of the Wingham Standpipe. Through the course of the investigation it was determined that the standpipe had degraded to the extent that action was required. Three options to address the structure were presented in the report which included:

1. Reduction of overall operating level to reduce operating pressure within the standpipe. – This option is considered a poor one by the operating authority as it barely meets the minimum water pressure requirements in the area of the standpipe;
2. Complete external strengthening of the existing standpipe until a replacement standpipe is constructed – Although viable, this is an expensive short-term measure intended to address the concerns until a new unit is replaced;
3. Complete a major rehabilitation of the existing standpipe including replacement of concrete and prestressing bands throughout the interior and exterior of the standpipe along with the application of new interior sealant. – This approach is difficult to price and expected to be cost prohibitive. It addresses current condition of the asset but does not provide long term resolution to the issue.

In September of 2016 a Request for Proposal for Engineering Services to guide the municipality through an EA process was released. The project was awarded to BM Ross at the November 7, 2016 Regular Meeting of Council through Resolution M594/16. The project was later incorporated into the master Servicing Plan which is funded through the Clean Water and Wastewater Fund (CWWF) program.

While working through the preliminary stages of the EA, it was determined that there are four primary options associated with the replacement of the Standpipe, some of which would negate the need to continue in the EA Process. The identified options are:

1. Major Rehabilitation of the existing standpipe;
2. Replacement of the standpipe on the same property;
3. Construction of an elevated storage tank in an alternate location; or,
4. Elimination of the standpipe in favour of a pressure system.

In order to proceed with the process of addressing the standpipe, staff is seeking direction from Council on the preferred option.

### **DISCUSSION**

In order to advance the project, Council must first consider the merits of major rehabilitation vs replacement of the existing standpipe.

#### **Major Rehabilitation:**

In order to repair the existing asset, the engineering assessment recommended the following process:

- The system must be removed from service and have all cladding removed to expose concrete.
- Painted finishes inside the standpipe must then be inspected and replaced. It is anticipated based on past inspection that the interior sealant would require replacement.
- All exterior and interior concrete would then be sounded and all areas of infiltration or delamination of concrete would be chipped out.
- Prestressing bands which show evidence of corrosion must be exposed, cleaned or replaced.
- Once all delaminated concrete is removed and corroded prestressing bands are addressed, all areas would be built back up with new concrete material.
- It is anticipated based on past inspection that the interior sealant would require replacement.

The report stated the following with regard to this Major Rehabilitation:

***“These recommendations are aimed at extending the life of the structure as much as possible; however, it is extremely difficult to ascertain a quantifiable value for the extension of life provided by these repairs.”***

Cost associated with the repair of the asset is difficult to determine as the full extent of the degradation will not be known until such time as the cladding is removed and the system is taken off-line.

Major rehabilitation of the existing standpipe will maintain the current operational status while addressing structural concerns. This option does not offer any opportunity for enhancement of the system nor does it support growth. This coupled with the unknowns surrounding cost and the uncertainty associated with the net increase in expected service life of the asset suggest that consideration surrounding replacement is warranted.

## **Replacement Options:**

Replacement of this asset provides three options, which are:

1. The replacement of the system with a pressurized system.
2. the construction of an elevated storage tank at an alternate site;
3. The construction of a replacement standpipe on the existing site;

Although each of these options ultimately perform the same function within the water system by regulating pressure and providing storage, there are fundamental differences between them.

### ***Pressurized System:***

A pressurized system has no gravity-based (elevated) storage in the system. This approach relies on an inventory of treated water held in a (typically) underground storage reservoir. The distribution system pressure is maintained by continuous pumping and relies heavily on technology through the use of pressure monitoring and variable frequency drives. As the system is entirely dependant on electric power, a standby generator and automatic transfer system is essential. In the event that there is a failure in the pump system, there will be an immediate loss of system pressure. These systems typically have a great deal of redundancy built into them to minimize the risk of total system failure and pressure loss. This approach will require purchase of additional lands to accommodate the construction of a storage reservoir. *An EA process must be undertaken to consider this option.*

### ***Elevated Storage:***

An elevated storage tank holds the entire inventory of water at a high elevation which allows the distribution system the benefit of using all of the water within the tank with virtually no loss of pressure. The utilization of an elevated storage tank in the Wingham distribution system introduces unique challenges. Due to the size of the structure, and complexity of the construction, the existing site cannot be used. As a result, there are additional costs associated with the purchase of land and the necessary extension of the watermain. During an engineering review it was noted that all of the identified sites that can accommodate an elevated storage tank are at a lower elevation. This requires a corresponding increase in the height of the structure to compensate for the lower base elevation which results in construction cost increases. *Like the Pressurized System, an EA process must be followed for this approach.*

### ***Replacement Standpipe:***

A standpipe such as the one in Wingham may hold the same inventory of water as an elevated storage tank, however as the water level drops in the tank, the system pressure experiences a corresponding decrease. The existing system has been in place since 1974 and has performed acceptably. In order to provide additional treated water inventory for current and future demands, it is being recommended by the design engineers that a replacement standpipe would be constructed with additional volume through increased height. Preliminary investigation indicates that a replacement standpipe can be accommodated on the same property. *As this is the replacement of a similar asset on the existing site, no EA process is required.*

From an operational perspective, either an elevated storage tank or a replacement standpipe are preferred based on the simplicity and inherent reliability associated with their design. Although an elevated storage facility is somewhat operationally superior, there is a significantly higher cost associated with the construction of the asset. Standpipes are common in the industry as a cost-effective alternative at the expense of some loss in operational flexibility.

If the option of replacing the standpipe with a new one on the existing site is selected, the project can proceed without the need for an EA which significantly decreases the complexity of the project.

### **FINANCIAL IMPACT**

Preliminary pricing for the elevated storage and standpipe options were secured through the Master Servicing Plan project to provide comparative costs for analysis.

Firms specializing in the two types of storage were contacted when available to acquaint themselves with the Wingham system and provided budget pricing as follows:

- Elevated Storage (excluding land purchase and demolition costs) - \$4,237,500.<sup>00</sup> plus taxes. Demolition costs are estimated at an additional \$100,000.<sup>00</sup> with land purchase at market value at time of purchase.
- Replacement Standpipe (constructed on site and including demolition) - \$3,412,500.<sup>00</sup>
- Pressure System - An estimate for a pressure system was not developed at this time as significant engineering time would be required to develop a preliminary design for the purpose of costing.

A project of this magnitude exceeds the water reserve fund which is currently at approximately \$2,500,000.<sup>00</sup>. It must be noted that this reserve fund has been accumulated through contribution from water users from all three Wards. Given the high cost of either option and the current level of reserves, Council has no alternative but to borrow a significant portion of the overall project cost.

Staff was authorized by Council through Resolution M388/18 to submit an application for funding toward the standpipe project under the last OCIF Top Up program. Unfortunately, the program was cancelled. There are currently no external funding opportunities available.

### **FUTURE CONSIDERATIONS**

The 2015 RJ Burnside report identified concerns and suggested short term measures to manage the asset. The measures that were suggested, which were outlined earlier in this report, presented either operational or financial challenges.

It is important to note that there was no reference in the 2015 Engineering Report to any concern of an imminent failure of the structure.

Meetings have been held between North Huron Public Works, Veolia, and RJ Burnside to identify viable interim monitoring measures. The purpose of the monitoring plan that is under development

is to ensure that the operating authority is aware of the condition of the asset and will be alerted should the current condition of the standpipe change.

**RELATIONSHIP TO STRATEGIC PLAN**

This project relates to **Goal No. 2** of the existing Strategic Plan in that our residents are engaged and well informed, **Goal No.3**, the Township is healthy and safe, and **Goal No. 4**, that the administration is fiscally responsible and strives for operational excellence.



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Sean McGhee, Director of Public Works



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Dwayne Evans, CAO