
To: Wayne Ormshaw, P.Eng.
Municipality of Lakeshore

From: Tony Berardi, P.Eng.
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File: 165620267

Date: December 14, 2022

Reference: County Road 22 Trunk Watermain Works - Oversizing

Introduction

The Municipality of Lakeshore (Town) has initiated the replacement of the existing 300mm dia. cast iron trunk watermain along County Road 22 from West Puce River Line Road to Wallace Line Road as envisioned in the 2018 Lakeshore Water & Wastewater Master Plan (2018 LWWWMP) with the procurement of engineering services from Stantec Consulting Ltd. The project is currently in the design stage with the confirmation of watermain sizing and the subject of this memo.

The 2018 LWWWMP identified the above existing 300 dia. watermain be replaced with a larger 400mm dia. watermain and form part of a westerly advancement of new trunk watermain infrastructure to service the current and future water needs of the western service area of the municipality.

Forming part of the advancement also includes a future 600mm dia. trunk watermain running east-west from West Puce River Line Road to Patillo Road across the middle of the Wallace Woods Development Lands approximately 1 kilometer south of and parallel to County Road 22. This watermain would ultimately connect to and support a future water tower to be situated generally in the area of Patillo Road and Little Baseline Road.

The proposed secondary 400mm dia. trunk replacement watermain running east -west along County Road 22, and the subject of this memo, will serve to convey the increased water demands of the northwestern service area of the municipality while facilitating the delivery of improved fire flow capacity and redundancy.

With the 300mm dia. replacement being the first advancement of this proposed new trunk watermain infrastructure, the viability, probability, and timelines of the future 600mm dia. trunk watermain within the Wallace Woods Development Lands comes into play and must be considered to confirm the size of the subject watermain replacement.

Should the future 600mm trunk watermain running through Wallace Woods be delayed or not constructed during the 20-year planning horizon to 2035, then the upgraded service levels for serving the western portion of the municipality cannot be realized as envisioned in the 2018 LWWWMP; thus, leaving the municipality with little or no alternatives to mitigate the matter other than constructing additional trunk watermain infrastructure in the future at significant cost.

Evaluation

The Belle River Water Supply System (BRWSS) consists of one pressure zone with system pressures generally governed by a combination of both the pressure head developed by the high lift pumping system at the Lakeshore water treatment plant (LWTP) and water levels in the Belle River water tower (BRWT).

A hydraulic computer model of the BRWSS was originally developed in the 2009 LWWWMP and updated in the 2018 LWWWMP to include all new watermains and developments. To evaluate the impact of delaying or not constructing the future 600mm dia. trunk watermain through the Wallace Woods Development lands, the updated model was employed to predict system behavior and system capabilities during both peak hour and maximum day + fire flow conditions under both current & future (20-year) demand scenarios in accordance with MECP Design Guidelines.

The model predicted that in the future 20-year demand horizon with the replacement 400mm dia. trunk watermain along County Road 22 in-place and the future 600mm dia. trunk watermain thru Wallace Woods

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not constructed; that adequate system pressures at or greater than the 40-psi benchmark could not be maintained nor upgraded fire flow targets achieved throughout the urban and rural areas of the western portion of the Belle River water service area west of Patillo Road under peak hour flow conditions. Further, the future water tower envisioned in the area of Patillo & Little Base Line Roads could not be supported. This predicted deficiency, however, could be mitigated by oversizing the proposed 400mm dia. trunk watermain replacement along County Road 22 to 600mm or by twinning the replacement 400mm dia. watermain in future.

The model also predicted that under the same future 20-year demand horizon with both the replacement 400mm dia. trunk watermain along County Road 22 and future 600mm dia. trunk watermain thru Wallace Woods in-place; that oversizing of the proposed 400mm dia. trunk watermain replacement along County Road 22 to 600mm dia. would result in minor additional system benefits to the western service area of the municipality with marginal increases in system pressures and fire-flow capabilities of 1 psi and approximately 200 Igpm at Patillo/CR22 and 100 Igpm at Manning Road respectively.

Similarly, under the current demand horizon, oversizing of the replacement 400mm dia. trunk watermain to 600mm dia. would also result in minor additional system benefits to the western service area of the municipality with similar marginal increases in system pressures and fire-flow capabilities.

With respect to the water treatment plant, oversizing of the proposed 400mm dia. trunk watermain replacement would have no foreseen impacts on the treatment process nor pumping capabilities.

Conclusion

In our opinion, oversizing of the proposed replacement trunk watermain along County Road 22 from 400mm dia. to 600mm dia. would only be needed if the viability, probability, and timelines of the future 600mm dia. trunk watermain through the Wallace Woods Development Lands were in question; based on projected water demands established in the 2018 LWWWMP.

It is our position that only the Municipality with input from the Water, Engineering and Planning Departments can assess and address this question based on current information and secondary planning work undertaken to date. Should there be significant concern with the probability of the future 600mm dia. trunk watermain being constructed within the future 20-year planning horizon to 2035, then serious consideration needs to be given towards proceeding with the oversizing.

Although, the oversizing would come at significant additional cost, it would provide the municipality with increased flexibility towards advancing the overall trunk watermain infrastructure to the West needed to satisfy increased future water demands from projected population growth. Overlooking this opportunity would result in significant additional mitigation costs much greater than the current oversizing cost should the concern come to fruition.

In light of this, the Town is encouraged to accelerate the replacement of the existing 300mm dia. cast iron watermain along County Road 22 from West Puce River Line Road westerly to Pike Creek and improving the level of service and fire flow protection to the western service area of the municipality as envisioned in the 2018 LWWWMP.

Sincerely,

Stantec Consulting Ltd.



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