

# **A G E N D A**

## **THE SECOND MEETING OF THE ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM BOARD OF MANAGEMENT**

**ELGIN MIDDLESEX  
PUMPING STATION**

**5:00 P.M.**

**JUNE 22, 2023**

### **DISCLOSURES OF INTEREST**

### **MINUTES**

Confirmation of the minutes of the meeting held on March 23, 2023.

### **REPORTS**

Options for Ford Water Tower Renewal

Report SWB-04-23 of Compliance Coordinator. **Pages 2-8**

### **CORRESPONDENCE**

### **UNFINISHED BUSINESS**

### **NEXT MEETING**

### **ADJOURNMENT**

**Directed to:** Chairman and Members of the Board of Management of the St. Thomas Area Secondary Water Supply System

**Date Authored:**

May 31, 2023

**Meeting Date:**

June 22, 2023

**Department:** Environmental Services

**Attachment**

**Prepared By:** Karel Kamerman  
Compliance Coordinator

**#1** –Normal Operations with Tower  
**#2** -EMPS Out of Service with Tower  
**#3** –EMPS and ARBS Out of Service with Tower  
**#4** -EMPS Out of Service (No Tower)  
**#5** -EMPS and ARBS Out of Service (No Tower)

**Subject: Options for Ford Tower Renewal**

**Recommendations:**

THAT: Report No. SWB 04-23, Options for Ford Tower Renewal, be received for information.

**Background:**

The Ford Elevated Tower serves as a water storage vessel and provides the St. Thomas Area Secondary Water Supply System (STASWSS) with protection from hydraulic transient pressures following pump shutdowns, valve closures, etc..

The Ford Elevated Tower is nearing the end of its useful life (estimated 0-10 years of life remaining). Failure of the Ford Elevated Tower would have minimal effect under day-to-day circumstances, however, operation of the system without the Tower or other mitigating measures would leave the Southwold and STASWSS systems at risk of significant impact from vacuum, in the event of a pump failure, power failure, or other transient pressure wave initiating event. This type of event could result in Boil Water Advisories on the system(s), affecting system users and disrupting school and restaurant operations, with an estimated recovery time of up to one week.

Three options are provided for the Board’s consideration for removal or replacement of the tower:

1. Replace the Tower with a tower of the same size.
2. Replace the Tower with a tower to hold a 1–2-day supply.
3. Remove the Tower



**Analysis:**

An elevated water tower provides instantaneous water supply and pressure regulation of the transmission main. Figure 1, attached, demonstrates how water is distributed by the existing water system under normal circumstances. The remainder of the figures (2-5) demonstrate the impact of various scenarios on the systems fed by the STASWSS for the 5-minute interval between pump failure and generator start-up, as this is the most difficult scenario for the system to manage. Figures 2 & 3 depict the effect on the system(s) of the EMPS and EMPS and ARBS respectively, not being able to operate given current system set up (i.e. with an elevated tower).

Removal of the Ford Elevated Tower would result in a wholesale change to the transient response of the STASWSS, relying on interconnections with other systems (Dutton-Dunwich and St. Thomas) to effectively mitigate the transient pressures. Figures 4 & 5 depict the effect on the system(s) during the 5-minute interval between pump failure and generator start-up in the event the EMPS and EMPS & ARBS, respectively, are not able to operate, following removal of the Ford Elevated Tower.

In order to mitigate the negative effects of transient pressure waves, it would be necessary to modify the existing interconnects between STASWSS and St. Thomas Drinking Water System at Wellington and Southwold Drinking Water System at Iona, construct new interconnects at Fingal Line and NW Area 1 connection point with STASWSS, obtain permission from the Municipality of Dutton-Dunwich to allow for back-feeding from their system to

Southwold under certain emergency response scenarios.<sup>3</sup> Initial discussions with Dutton-Dunwich staff have not been favourable. Further feasibility modelling would also be required in order to demonstrate that the Dutton-Dunwich system and the St. Thomas system can provide adequate volume in the necessary time frame to mitigate the transient pressures and avoid a vacuum scenario.

Staff are seeking direction on which option below is preferred for renewal of the Ford Elevated Tower, given the initial response from Dutton Dunwich Staff.

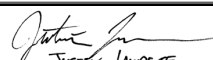
The three options proposed are summarized below, along with the Pro's and Con's of each option.

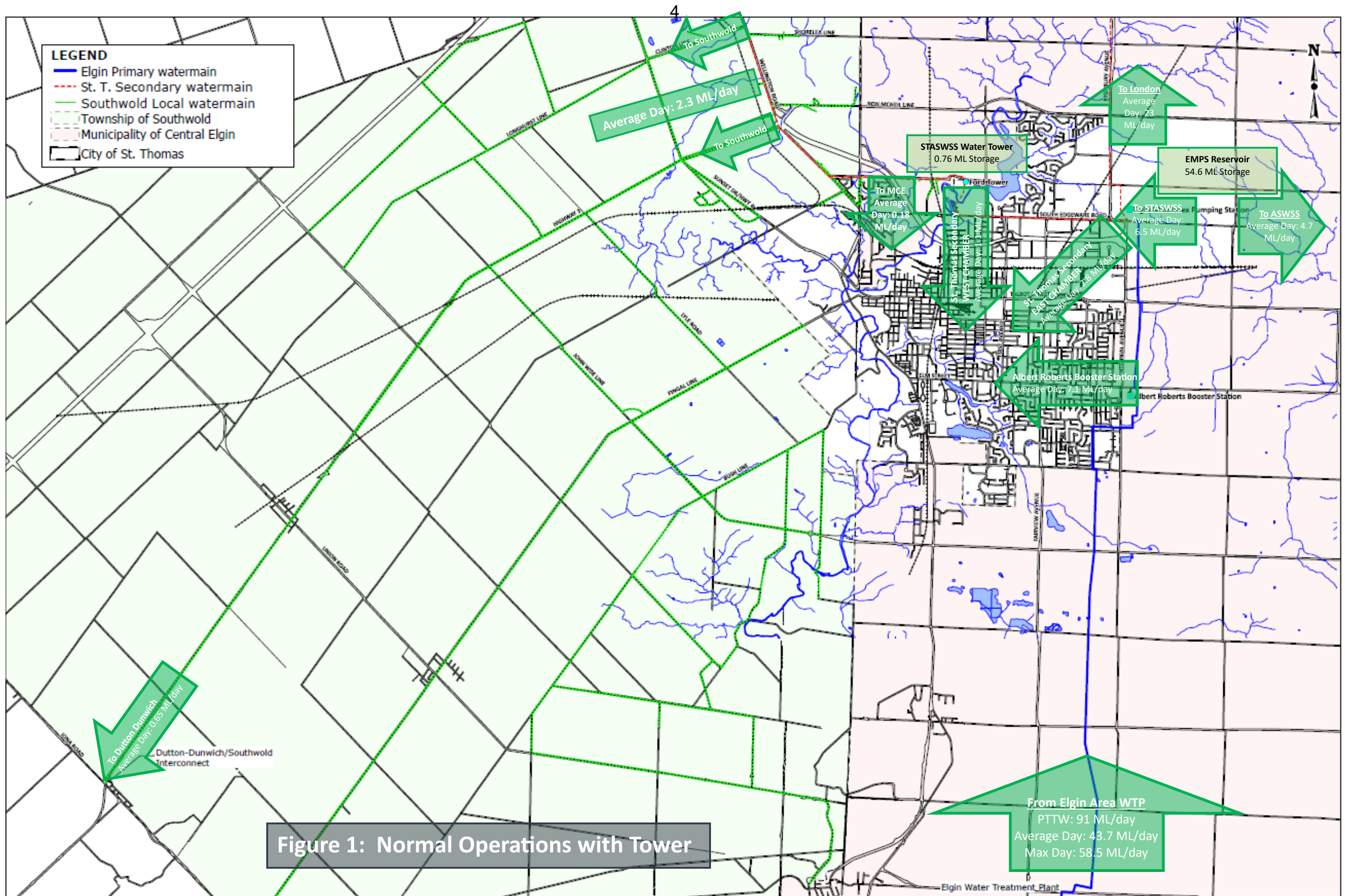
Option	Pro's	Con's
1. Like for Like Tower Replacement (~800 m3)	<ul style="list-style-type: none"> <li>- System remains self-sufficient in transient pressure mitigation.</li> <li>- Storage for short-term interruptions (~1hour?)</li> </ul>	<ul style="list-style-type: none"> <li>- Cost Estimate: \$5-10 million</li> </ul>
2. Upsized Tower Replacement (7600 m3)	<ul style="list-style-type: none"> <li>- System remains self-sufficient in transient pressure mitigation.</li> <li>- Storage for medium-term water supply interruptions (~1 -2 days)</li> </ul>	<ul style="list-style-type: none"> <li>- Cost Estimate: \$8 -12 million</li> </ul>
3. Remove Tower by: <ol style="list-style-type: none"> <li>Obtain cooperation of Dutton Dunwich; Complete feasibility studies on Dutton Dunwich system and ARBS; Construct Fingal Line interconnect; Alter Wellington and Iona interconnects.</li> <li>Obtain cooperation of Dutton Dunwich; Complete feasibility studies on Dutton Dunwich system and ARBS; Construct Fingal Line and NW1 interconnect; Modify Wellington and Iona interconnects</li> <li>Seek out other Options.</li> </ol>	<ul style="list-style-type: none"> <li>- Cost Estimate: \$1-2 million</li> </ul>	<ul style="list-style-type: none"> <li>- Reliance on Dutton-Dunwich back feed necessary, staff have said no.</li> <li>- More modelling work required to ensure this solution is feasible.</li> <li>- Reliance on St. Thomas DWS.</li> <li>- No Storage for supply W/M break or system isolation resilience.</li> </ul>

Respectfully,



Karel Kamerman, B.Sc, C.Tech.  
Compliance Coordinator

Reviewed By:  -  
Susan Lawrence  
Env. Services



**Figure 1: Normal Operations with Tower**

