JOINT AGENDA

AYLMER AREA SECONDARY WATER SUPPLY SYSTEM
PORT BURWELL AREA SECONDARY WATER SUPPLY SYSTEM

JOINT BOARD OF MANAGEMENT

September 06, 2023 – 1:00 PM
Malahide Council Chambers
51221 Ron McNeil Ln, Springfield, ON

Invited to Attend

Board Members:

Municipality of Central Elgin – Norman Watson
Town of Aylmer – Pete Barbour
Township of Malahide – Chester Glinski
Municipality of Bayham – Tim Emerson

Staff:

Municipality of Central Elgin – Alex Piggott, and Geoff Brooks
Town of Aylmer – Rob Johnson, and Connor Bailey
Township of Malahide – Adam Boylan, Jason Godby, Sam Gustavson, Allison Adams, and Cassandra Young
Municipality of Bayham – Ed Roloson, and Thomas Thayer

(1) Call to Order

(_____) is appointed Chair and the meeting is called to order at (_____).

(2) Disclosure of Pecuniary Interest

Disclosures of pecuniary interest may be declared at this time: (_____).

(3) Adoption of Prior Minutes

Moved by:
Seconded by:

THAT the minutes of the Aylmer Area Secondary Water Supply System Joint Board of Management meeting held on June 07, 2023, be approved as circulated.

Moved by:
Seconded by:

THAT the minutes of the Port Burwell Area Secondary Water Supply System Joint Board of Management meeting held on June 07, 2023, be approved as circulated.

(4) 2023 Q1/Q2 Operations

Moved by:
Seconded by:

THAT Report No. AASWSS-23-07 entitled "First and Second Quarter 2023 Operations Report" be received.

Moved by:
Seconded by:

THAT Report No. PBASWSS-23-08 entitled "First and Second Quarter 2023 Operations Report" be received.

(5) Capital Project Update

Moved by:
Seconded by:

THAT Report No. AASWSS-23-08 entitled "Aylmer Area Secondary Water Supply System Capital Project Update" be received.

Moved by:
Seconded by:

THAT Report No. PBASWSS-23-09 entitled "Port Burwell Area Secondary Water Supply System Capital Project Update" be received.

(6) Port Burwell Water Tower Inspection

Moved by:
Seconded by:

THAT Report No. PBASWSS-23-10 entitled "Port Burwell Water Tower Inspection and Cathodic Protection Survey Report" be received.

(7) Correspondence

i. Highbury Avenue Widening Class EA Letter to R.V. Anderson Associates Limited from the administering municipality on behalf of AASWSS

ii. Major Arterial Roadway (MAR) Connection Municipal Class EA Letter to Arcadis IBI Group from the administering municipality on behalf of AASWSS

iii. Invitation to Participate in the Interview Component of the Interlocal Agreements and Collaboration Project to Representatives and Important Figures Associated with the Lower and Single-Detached Municipalities of Elgin County from Duncan J. Goetze, University of Guelph

(8) New Business

Upcoming 2023 Meeting Dates – December 06, 2023

(9) Adjournment

Moved by:
Seconded by:

THAT the Aylmer Area Secondary Water Supply System Joint Board of Management adjourn at ___ p.m. to meet again on December 06, 2023 at 1:00 p.m.

Moved by:
Seconded by:

THAT the Port Burwell Secondary Water Supply System Joint Board of Management adjourn at ___ p.m. to meet again on December 06, 2023 at 1:00 p.m.

MINUTES

AYLMER AREA SECONDARY WATER SUPPLY SYSTEM
PORT BURWELL AREA SECONDARY WATER SUPPLY SYSTEM

JOINT BOARD OF MANAGEMENT

June 07, 2023 – 1:00 PM
Malahide Council Chambers
51221 Ron McNeil Ln, Springfield, ON

In Attendance

Board Members:

Municipality of Central Elgin – Norman Watson
Town of Aylmer – Pete Barbour
Township of Malahide – Chester Glinski
Municipality of Bayham – Rainey Weisler

Staff:

Municipality of Central Elgin – Alex Piggott
Town of Aylmer –
Township of Malahide – Adam Boylan, Sam Gustavson, and Cassandra Young
Municipality of Bayham – Ed Roloson

(1) Call to Order

Pete Barbour is appointed Chair and the meeting is called to order at 1:03 p.m.

(2) Disclosure of Pecuniary Interest

Disclosures of pecuniary interest may be declared at this time: None.

(3) Adoption of Prior Minutes

Moved by: Norman Watson
Seconded by: Chester Glinski

THAT the minutes of the Aylmer Area Secondary Water Supply System Joint Board of Management meeting held on March 08, 2023, be approved as circulated.

Carried.

Moved by: Rainey Weisler
Seconded by: Norman Watson

THAT the minutes of the Port Burwell Area Secondary Water Supply System Joint Board of Management meeting held on March 08, 2023, be approved as circulated.

Carried.

(4) Financial Statements – Presentation by Adam Boylan

Moved by: Chester Glinski
Seconded by: Norman Watson

THAT the 2022 Audited Financial Statements be received;

AND THAT the Chair be authorized to sign the Engagement Letter, Audit Planning Letter, and Audit Findings Letter from Graham, Scott, Enns LLP, dated June 7, 2023, on behalf of the AASWSS Board.

AND THAT the Aylmer Area Secondary Water Supply System 2022 surplus of $142,024 be transferred to reserves.

Carried.

Moved by: Rainey Weisler
Seconded by: Norman Watson

THAT the 2022 Audited Financial Statements, as prepared by Graham, Scott, Enns LLP, be received;

AND THAT the Chair be authorized to sign the Engagement Letter, Audit Planning Letter, and Audit Findings Letter from Graham, Scott, Enns LLP, dated June 7, 2023, on behalf of the PBASWSS Board.

AND THAT the Port Burwell Area Secondary Water Supply System 2022 surplus of $52,230 be transferred to reserves.

Carried.

(5) 2022 Section 11 & Schedule 22 Reports

Moved by: Norman Watson
Seconded by: Chester Glinski

THAT Report No. AASWSS-23-04 entitled "Aylmer Area Secondary Water Supply System (AASWSS): 2022 Section 11 Annual Report and Schedule 22 Summary Report" be received.

Carried.

Moved by: Rainey Weisler
Seconded by: Norman Watson

THAT Report No. PBASWSS-23-04 entitled "Port Burwell Area Secondary Water Supply System (PBASWSS): 2022 Section 11 Annual Report and Schedule 22 Summary Report" be received.

Carried.

(6) 2023 Q1 Operations

Moved by: Norman Watson
Seconded by: Chester Glinski

THAT Report No. AASWSS-23-05 entitled "First Quarter 2023 Operations Report" be received.

Carried.

Moved by: Rainey Weisler
Seconded by: Norman Watson

THAT Report No. PBASWSS-23-06 entitled "First Quarter 2023 Operations Report" be received.

Carried.

(7) Pipeline Desktop Condition Assessment

Moved by: Rainey Weisler
Seconded by: Norman Watson

THAT Report No. PBAWSS-23-05 entitled "Port Burwell Area Secondary Water Supply System - Pipeline Desktop Condition Assessment" be received;

AND THAT the Port Burwell Area Secondary Water Supply System Joint Board of Management does hereby authorize the Sole Source acquisition of the Pipeline Desktop Condition Assessment from Pure Technologies, a Xylem Brand;

AND THAT the Port Burwell Area Secondary Water Supply System Joint Board of Management does hereby accept the quote received from Pure Technologies, a Xylem Brand, in the amount of $25,000.00 (excluding applicable taxes), for the undertaking and completion of a Pipeline Desktop Condition Assessment of the Port Burwell Area Secondary Water Supply System.

Carried.

(8) Correspondence

(9) New Business

Upcoming 2023 Meeting Dates – September 06, 2023 and December 06, 2023

(10) Adjournment

Moved by: Chester Glinski
Seconded by: Norman Watson

THAT the Aylmer Area Secondary Water Supply System Joint Board of Management adjourn at 2:40 p.m. to meet again on September 06, 2023 at 1:00 p.m.

Carried.

Moved by: Rainey Weisler
Seconded by: Norman Watson

THAT the Port Burwell Secondary Water Supply System Joint Board of Management adjourn at 2:41 p.m. to meet again on September 06, 2023 at 1:00 p.m.

Carried.

Aylmer Area Secondary Water Supply System

REPORT NO.: AASWSS-23-07

DATE: August 15, 2023

ATTACHMENT: OCWA First and Second Quarter 2023 Operations Reports

SUBJECT: **2023 First and Second Quarter Operations Report**

Recommendation:

THAT Report No. AASWSS-23-07 entitled "First and Second Quarter 2023 Operations Report" be received.

Background:

The Ontario Clean Water Agency (OCWA) and the Staff of the Administering Municipality (Township Staff), formally meet on a quarterly basis to review the operations and maintenance of the AASWSS. OCWA and the Township Staff discuss recommended lifecycle/capital work, bacteriological/chemical sample results, regulatory compliance, and possible emerging issues. OCWA provides detailed operations reports and performance assessment reports at these meetings.

Comments/Analysis:

This report is a summary of the operations and maintenance for the first and second quarters of 2023. This report is submitted to the Joint Board of Management to satisfy specific requirements of the QEMS Operational Plan for the AASWSS. Additionally, this approach ensures that the Joint Board of Management is kept informed on the operational performance of the water system on a continual basis by Township Staff.

The Township Staff met with OCWA to discuss the attached operations report on August 14, 2023. At their meeting, Township and OCWA Staff reviewed the system operations for the first and second quarter of 2023. Some of the specific items that were discussed are outlined below.

Compliance Summary:

There were no compliance or exceedance issues during the first and second quarter of 2023.

Inspections:

There were no MECP or MOL inspections during the first and second quarter of 2023.

QEMS Update:

There were no QEMS updates during the first and second quarter of 2023.

Performance Assessment:

The average daily flow to the system from the Elgin Area Primary Water Supply System thus far in 2023 was 4,792.90 m^3/d which is a 0.9% increase when compared to 2022 (4,749.84 m^3/d).

Weekly microbiological samples were taken by OCWA via sampling stations throughout the transmission main. Samples are collected at 3 separate locations each week. Samples are tested for E. coli, Total coliforms and HPC's. Samples are shipped to SGS laboratories which is an accredited laboratory.

OCWA tested for free chlorine residuals throughout the distribution system two times per week. Quarterly samples were collected for Trihalomethanes (THMs) and Halo Acetic Acids (HAAs) in accordance with regulatory requirements. All sample results tested were well below the Maximum Allowable Concentrations (MAC) set forth in O.Reg. 170/03. OCWA continues to meet or exceed the Provincial Regulations pertaining to microbiological sampling requirements.

Further information relating to water sampling results is outlined in the attached report.

General Maintenance:

OCWA conducted various maintenance activities during the first and second quarters of 2023. Activities include but are not limited to, regular readings and checks, the inspection and pumping of all chambers including air release chambers, and monthly alarm testing. Annual meter calibrations were completed in March 2023. Spring hydrant flushing and fire flow testing was also completed in Q2 of this year, but is not mentioned in the OCWA report attached. Further information regarding maintenance completed in 2023 can be found in the attached report.

Alarms:

There were some alarms that occurred during the first and second quarter of 2023. These alarms were minor in nature and received the appropriate response from OCWA at the time they occurred. Further information regarding alarms can be found in the attached report.

Complaints & Concerns:

There were no complaints from the public that required a response from OCWA in the first and second quarter of 2023.

Summary:

Quarterly meetings with OCWA are an effective tool used to keep the Township Staff well informed as to the operations and maintenance of the drinking water system. The information provided to the Board by OCWA is used to help the Joint Board of Management make well thought out decisions in an effort to provide a continual safe supply of potable water.

Submitted by:	Approved by:	Approval for Board:
Sam Gustavson Water/Wastewater Operations Manager	Jason Godby Director of Public Works	Adam Boylan Acting Chief Administrative Officer

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Aylmer Area Secondary Water Supply System Operations Report

Second Quarter 2023

Ontario Clean Water Agency, Southwest Region
Mark Harris, Sr. Operations Manager, Aylmer Cluster
Date: July 27, 2023

Facility Description

Facility Name:	Aylmer Area Secondary Water Supply System
Regional Manager:	Dale LeBritton - (519) 476-5898
Sr. Operations Manager:	Mark Harris - (226) 545-0414 / Vitaliy Talashok - (226) 378-8986
Business Development Manager:	Robin Trepanier - (519) 791-2922
Facility Type:	Municipal
Classification:	Class 2 Water Distribution
Drinking Water System Category:	Large Municipal Residential
Title Holder:	Municipality
Operation Status:	OCWA

Service Information

Area(s) Serviced:	Central Elgin, Malahide, and Aylmer
Population Serviced:	593
Malahide Direct Connections:	53
Central Elgin Connections:	175

Operational Description

This is an 18" watermain from St. Thomas to Aylmer with booster pumps at the Elgin Middlesex Pumping Station.

CLIENT CONNECTION MONTHLY CLIENT REPORT

Facility Name: Aylmer Area Secondary Water Supply System
ORG#: 6614

SECTION 1: COMPLIANCE SUMMARY

FIRST QUARTER:

There were no compliance issues reported the first quarter.

SECOND QUARTER:

There were no compliance issues reported the second quarter.

SECTION 2: INSPECTIONS

FIRST QUARTER:

There were no Ministry of Environment, Conservation and Parks (MECP) or MOL inspections during the first quarter.

SECOND QUARTER:

There were no Ministry of Environment, Conservation and Parks (MECP) or MOL inspections during the second quarter.

SECTION 3: QEMS UPDATE

FIRST QUARTER:

There were no QEMS updates during the first quarter.

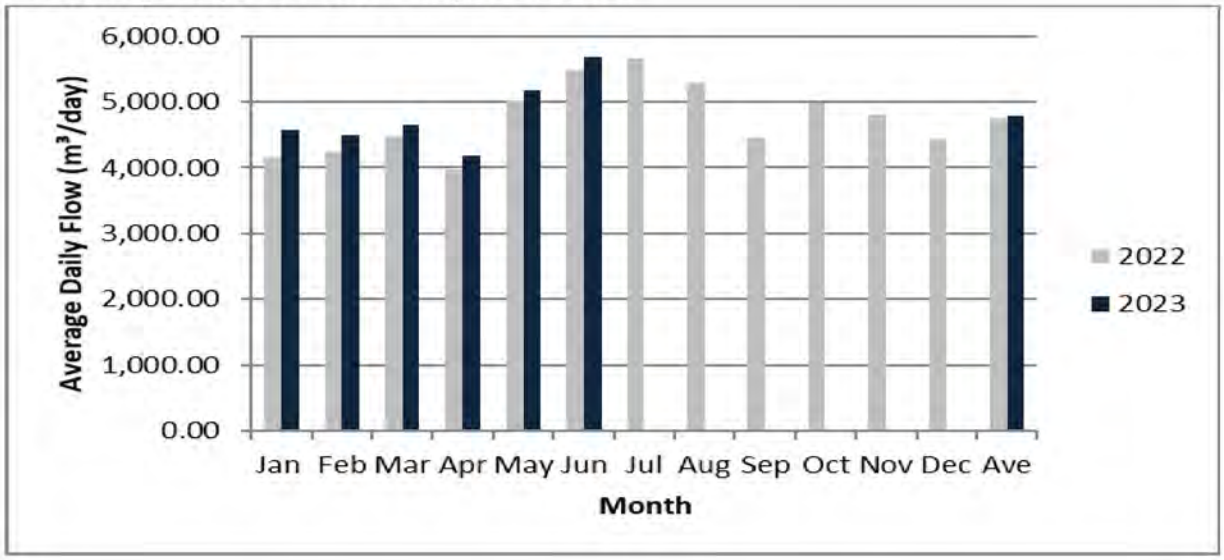
SECOND QUARTER:

There were no QEMS updates during the second quarter.

SECTION 4: PERFORMANCE ASSESSMENT REPORT

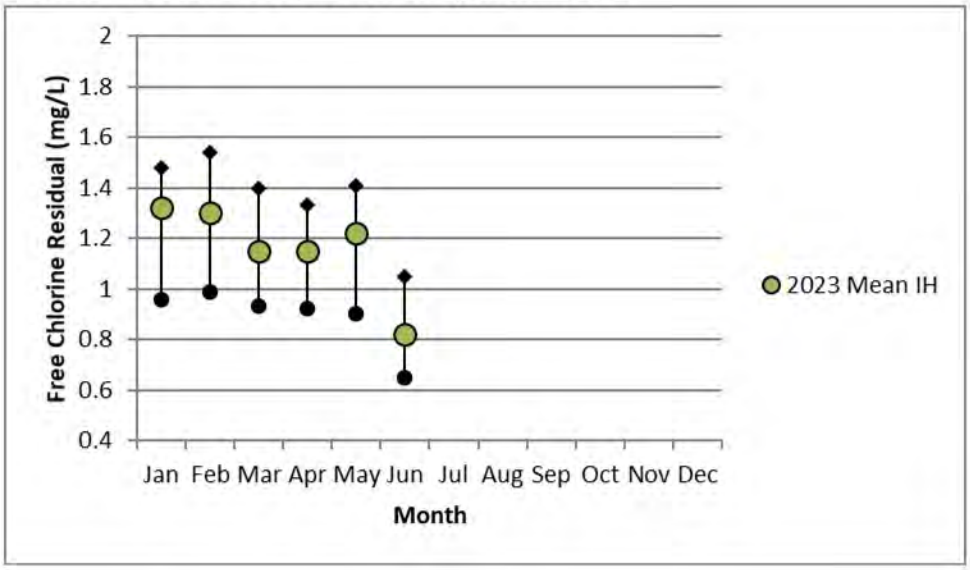
Flows are recorded at various points within the distribution system. The average daily flow to the system from the Elgin Area Primary Water Supply System so far in 2023 is 4,792.90m³/d which is up 0.9% when comparing to 2022 (4,749.84m³/d). Chart 1 below depicts the average daily flows for 2023 compared to 2022.

Chart 1. Average daily flows in 2023 compared to 2022.



Chlorine residuals are obtained throughout the distribution system two times per week, with 4 residuals taken on sample days (usually Monday's) and three residuals taken at least 48 hours after the first set (usually on Friday's) to meet the regulatory requirements. The chart below depicts the minimum, maximum and average chlorine residuals taken in the distribution system for 2023. The concentration of free chlorine varies depending on the location that the sample taken (see chart below).

Chart 2. Free Chlorine Residual in the Distribution System in 2023.



Samples are obtained once per week at three locations along the transmission main. The following table summarizes the results of the microbiological sampling for 2023.

Month	# Samples	E. coli Range (cfu/100mL)	Total Coliform Range (cfu/100mL)	# Samples	Heterotrophic Plate Count Range (cfu/mL)
January	15	0 – 0	0 – 0	5	<10 - <10
February	12	0 – 0	0 – 0	4	<10 - <10
March	13	0 – 0	0 – 0	5	<10 - <10
April	12	0 – 0	0 – 0	4	<10 - <10
May	16	0 – 0	0 – 0	6	<10 - <60
June	12	0 – 0	0 – 0	4	<10 - <10

Trihalomethanes (THMs) are sampled on a quarterly basis; the 2023 current running average is 19.50µg/L. When comparing the current running average to the 2022 average (20.25µg/L) there has been a decrease of 3.7%. The results are well below the limit of 100 µg/L.

	Limit (µg/L)	THM Result (µg/L)
July 2022	-	24
October 2022	-	23
January 2023	-	15
April 2023	-	16
Running Average	**100**	**19.50**

Haloacetic Acids (HAAs) are required to be sampled on a quarterly basis. The 2023 current running average is 6.48µg/L. When comparing the current running average to the 2022 average (6.53µg/L) there has been a 0.8% decrease. The results remain well below the limit of 80µg/L.

	Limit (µg/L)	HAA Result (µg/L)
July 2022	-	7.7
October 2022	-	7.4
January 2023	-	5.3
April 2023		5.5
Running Average	80	**6.48**

SECTION 5: OCCUPATIONAL HEALTH & SAFETY

FIRST QUARTER:

There were no Health & Safety issues identified during the first quarter.

SECOND QUARTER:

There were no Health & Safety issues identified during the second quarter.

SECTION 6: GENERAL MAINTENANCE

FIRST QUARTER:

JANUARY

03: Quarterly THM and HAA samples obtained
05: Monthly meter reads and chamber inspections completed
16: High float and power failure alarms tested at chamber 16 and chamber 13
27: Air relief chambers inspected and pumped as needed
30: Air relief chambers inspected

FEBRUARY

06: Monthly meter reads and chamber inspections completed. Chambers pumped as needed.
07: Air relief chamber inspections and pumping
16: Summa on site – plc replacement at chamber 16
21: High float alarms tested at chambers 16 and 13
22: Air relief chamber inspections and pumping
27: Air relief chamber inspections

MARCH

02: Monthly meter reads and chamber inspections completed. Pumped chambers as needed. Unable to obtain chamber 13 readings due to flow meter issue.
03: SCG Flowmetrix on site at chamber 13 to assess flow meter programming issue.
07: SCG Flowmetrix completed annual calibrations of Rogers Road and chamber 13 flow meters
Air relief, isolation, bypass valve exercising. Chambers pumped as needed.
16: Air relief, isolation, throttling, and bypass valve exercising. Chambers pumped as needed.
21: Air relief, isolation and throttling valve exercising. Chambers pumped as needed.
24: High float and power failure alarm tested at chambers 13 and 16

SECOND QUARTER:

APRIL

03: Obtained quarterly THM and HAA samples
13: Monthly air relief chamber inspections/pumping. Tertiary metering chambers pumped.
14: Leak noted at Tower Road metering chamber. Nichol Water on site. Leak could not be located.
24: Power failure and high float alarms tested at chambers 16 and 13
26: Isolation valves, bypass valves, throttling valves at multiple locations tested (see valve inspection records)

MAY

02: Tertiary metering chambers pumped out
08: Power failure and high float alarms tested at chambers 16 and 13
09: PBR and Township of Malahide on site at Tower Road for excavation due to leak. Unable to locate leak.
17: Valve exercising at Norton Street
18: Valve exercising at Springwater Road. Drain valve chamber pumping.
24: Valve exercising at Springwater Road
30: Drain valve chamber pumping
31: Drain valve chamber pumping

JUNE

07: Communication loss at chamber 13 for EMPS. Reset router and modem.
09: Farmington Mechanical installed eye bolts in chambers 16 and 13 to facilitate alarm checks.
13: Tested high level and power failure alarms at chambers 16 and 13
14: Completed monthly air relief chamber inspections/pumping. Pumped out tertiary metering chambers.
22: Drain valve chamber pumping
29: Drain valve chamber pumping

SECTION 7: ALARM SUMMARY

FIRST QUARTER:

JANUARY

06: Received communication alarm – chamber 16. Operator attended site. Modem reset. Communications restored.
07: Received communication alarm – chamber 16. Operator attended site. Communications already restored upon arrival. Eastlink consulted and will open work order for site visit as needed.
12: Received communication alarm – chamber 16. Operator attended site. Reset modem, router, and main power. Communications restored.

FEBRUARY

Received power failure and flow transmitter fault alarms for chamber 13 due to power outages in the area.
23: Received power failure and flow transmitter fault alarms for chamber 16 due to power outages in the area.
Received power failure and flow transmitter fault alarms for chamber 13 due to power outages in the area.

MARCH

20: Received telephone call from Manager, Vitality Talashok, regarding a fire in Aylmer. Contacted WWOM, Sam Gustavson. Monitored Aylmer Tower level and pressure.

SECOND QUARTER:

APRIL

01: Power failure and flow transmitter fault alarms received at chamber 13.

MAY

No alarms this month.

JUNE

No alarms this month.

SECTION 8: COMMUNITY COMPLAINTS & CONCERNS

FIRST QUARTER:

There were no community complaints received during the first quarter.

SECOND QUARTER:

There were no complaints or concerns received during the second quarter.

Port Burwell Area Secondary Water Supply System

REPORT NO.: PBASWSS-23-08

DATE: August 15, 2023

ATTACHMENT: OCWA First and Second Quarter 2023 Operations Reports

SUBJECT: **2023 First and Second Quarter Operations Report**

Recommendation:

THAT Report No. PBASWSS-23-08 entitled "First and Second Quarter 2023 Operations Report" be received.

Background:

The Ontario Clean Water Agency (OCWA) and the Staff of the Administering Municipality (Township Staff) formally meet on a quarterly basis to review the operations and maintenance of the PBASWSS. OCWA and the Township Staff discuss recommended lifecycle/capital work, bacteriological/chemical sample results, regulatory compliance, and possible emerging issues. OCWA provides detailed operations reports and performance assessment reports at these meetings.

Comments/Analysis:

This report is a summary of the operations and maintenance for the first and second quarters of 2023. This report is submitted to the Joint Board of Management to satisfy specific requirements of the QEMS Operational Plan for the PBASWSS. Additionally, this approach ensures that the Joint Board of Management is kept informed on the operational performance of the water system on a continual basis by the Township Staff.

The Township Staff met with OCWA to discuss the attached operations report on August 14, 2023. At their meeting Township and OCWA Staff reviewed the system operations for the first and second quarter of 2023. Some of the specific items that were discussed are outlined below.

Compliance Summary:

There were no compliance or exceedance issues in the first and second quarters of 2023.

Inspections:

There were no MECP or MOL inspections during the first or second quarter of 2023.

QEMS Update:

There were no QEMS updates during the first or second quarter of 2023.

Performance Assessment:

The average daily flow to the system from the Elgin Area Water Supply System (recorded at MV1) thus far in 2023 was 591.1 m^3/d. This is a 22.4% decrease when compared to 2022 (761.5 m^3/d).

Weekly microbiological samples were taken by OCWA via sampling stations throughout the transmission main. Samples are tested for E. coli, Total coliforms and HPC's. Samples are shipped to SGS laboratories which is an accredited laboratory.

There were no adverse sample results during the first and second quarters of 2023.

OCWA tested for chlorine residuals throughout the distribution system two times per week. There are also three continuous on-line chlorine analyzers for the system located at the Port Burwell Tower, and the Dexter Line and Lakeview re-chlorination facilities. These analyzers provide continuous data and trending for each facility and are connected to SCADA with the ability to notify operators in the event an alarm occurs which requires an Operator response. OCWA continues to meet or exceed the Provincial Regulations pertaining to microbiological sampling requirements.

Quarterly samples were collected for Trihalomethanes (THMs) and Halo Acetic Acids (HAAs) in accordance with regulatory requirements. All sample results tested were well below the Maximum Allowable Concentrations (MAC) set forth in O.Reg. 170/03. OCWA continues to meet or exceed the Provincial Regulations pertaining to microbiological sampling requirements.

Further information relating to water sampling results is outlined in the attached report.

General Maintenance:

OCWA conducted various maintenance activities during the first and second quarters of 2023. Activities include, but not limited to, regular readings and checks, the inspection and pumping of air release chambers, chemical feed system repairs at re-chlorination facilities, and monthly alarm testing. Annual flow meter and pressure transmitter calibrations were completed in March 2023. Spring hydrant flushing and fire flow testing was also completed in Q2 of this year, but is not mentioned in the OCWA report attached. Further information regarding maintenance completed in 2023 can be found in the attached report.

Alarms:

OCWA reported multiple alarms during the first and second quarter of 2023. Some alarms were a result of communication failures of the SCADA system and power

failures. There were also various alarms resulting from the re-chlorination facilities outlined in the attached report. All alarms in the first and second quarter were minor in nature and were responded to and resolved by OCWA as outlined in the attached report.

Complaints & Concerns:

There were no complaints received during the first quarter of 2023.

There was one complaint received from the public that was received by Malahide Township during the second quarter of 2023. Further information relating to the complaint and the response it received is outlined in the attached report.

Summary:

Quarterly meetings with OCWA are an effective tool used to keep the Township Staff well informed as to the operations and maintenance of the drinking water system. The information provided to the Board by OCWA is used to help the Joint Board of Management make well thought out decisions in an effort to provide a continual safe supply of potable water.

Submitted by:	**Approved by:**	**Approval for Board:**
Sam Gustavson Water/Wastewater Operations Manager	Jason Godby Director of Public Works	Adam Boylan Acting Chief Administrative Officer

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Port Burwell Area Secondary Water Supply System Operations Report Second Quarter 2023

Ontario Clean Water Agency, Southwest Region
Mark Harris, Sr. Operations Manager, Aylmer Cluster
Date: July 27, 2023

Facility Description

Facility Name:	Port Burwell Area Secondary Water Supply System
Regional Manager:	Dale LeBritton - (519) 476-5898
Sr. Operations Manager:	Mark Harris - (226) 545-0414 / Vitaliy Talashok - (226-378-8986)
Business Development Manager:	Robin Trepanier - (519) 791-2922
Facility Type:	Municipal
Classification:	Class 2 Water Distribution
Drinking Water System Category:	Large Municipal Residential
Title Holder:	Municipality
Operation Status:	OCWA

Service Information

Area(s) Serviced:	Municipality of Central Elgin, Malahide & Bayham
Population Serviced:	730
Malahide Direct Connections:	204
Central Elgin Connections:	75

Operational Description

This is a 12-inch watermain from the Elgin Area Water Treatment Plant to Port Burwell including an elevated tank west of Pt. Burwell. Includes re-chlorination at the tower and at Lakeview Re-Chlorination Facility.

CLIENT CONNECTION MONTHLY CLIENT REPORT

Facility Name: Port Burwell Secondary - Lakeview, Burwell tower, Valve house
ORG#: 5911

SECTION 1: COMPLIANCE SUMMARY

FIRST QUARTER:

There were no compliance issues reported during the first quarter.

SECOND QUARTER:

There were no compliance issues reported during the second quarter.

SECTION 2: INSPECTIONS

FIRST QUARTER:

There were no Ministry of Environment, Conservation and Parks or MOL inspections conducted during the first quarter.

SECOND QUARTER:

There were no Ministry of Environment, Conservation and Parks or MOL inspections conducted during the second quarter.

SECTION 3: QEMS UPDATE

FIRST QUARTER:

There were no QEMS updates this quarter.

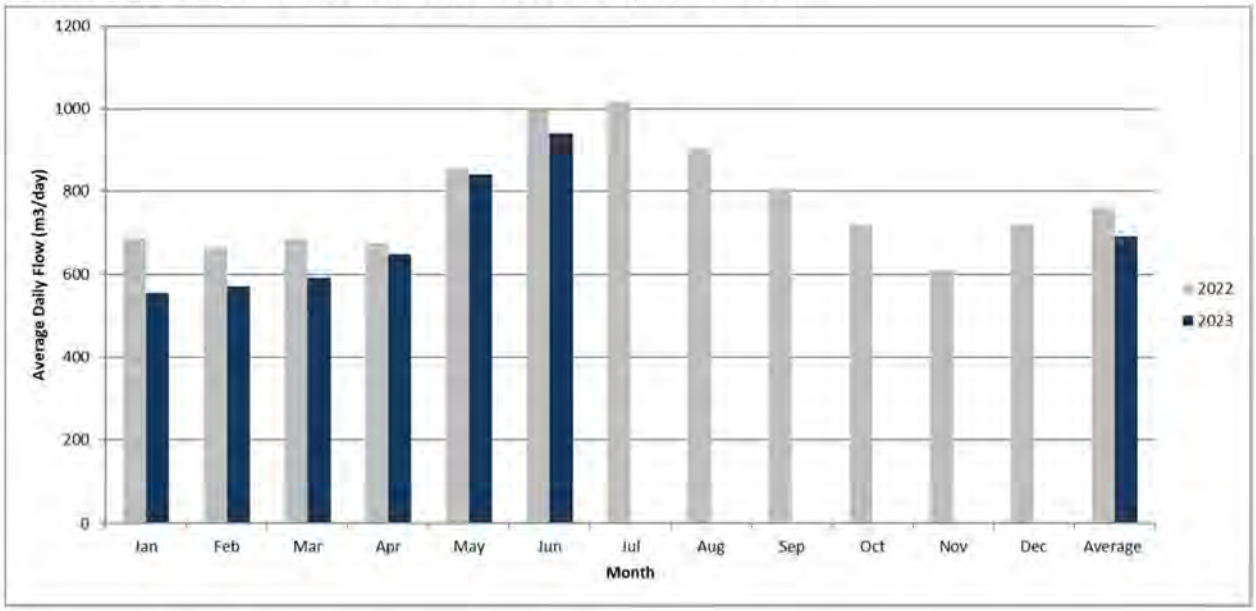
SECOND QUARTER:

There were no QEMS updates this quarter.

SECTION 4: PERFORMANCE ASSESSMENT REPORT

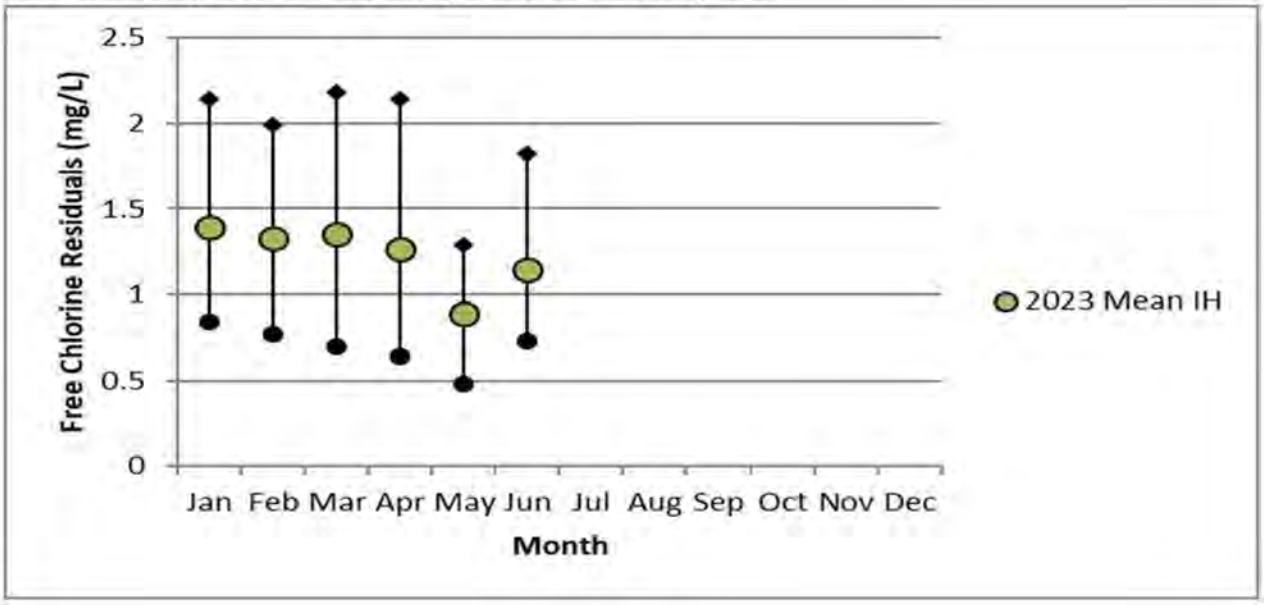
Flows are recorded at various points within the distribution system. The average daily flow to the system from the Elgin Area Primary Water Supply System (recorded at MV1) in 2023 so far is 591.1m^3/d. This is down 22.4% when comparing to 2022 (761.5 m^3/d). Chart 1 below depicts the average daily flow in 2023 compared to 2022.

Chart 1. Average daily flow from the EMPS in 2023 compared to 2022.



Chlorine residuals are obtained throughout the distribution system two times per week, with 4 residuals taken on sample days (usually Mondays) and three residuals taken at least 48 hours after the first set (usually on Fridays) to meet the regulatory requirements. Chart 2 below depicts the minimum, maximum and average chlorine residuals taken in the distribution system in 2023. The concentration of free chlorine varies depending on the location of sample taken. All results met regulatory requirements.

Chart 2. Minimum, maximum and average chlorine residuals, 2023.



The chlorine residuals are continuously monitored at the re-chlorination facilities at Dexter Line, the Tower and Lakeview. Chart 3 below provides the monthly average, minimum and maximum free chlorine residuals at the Dexter Line Re-Chlorination Facility in 2023.

Chart 3. Minimum, maximum and average chlorine residuals recorded at Dexter Line Re-chlorination, 2023.

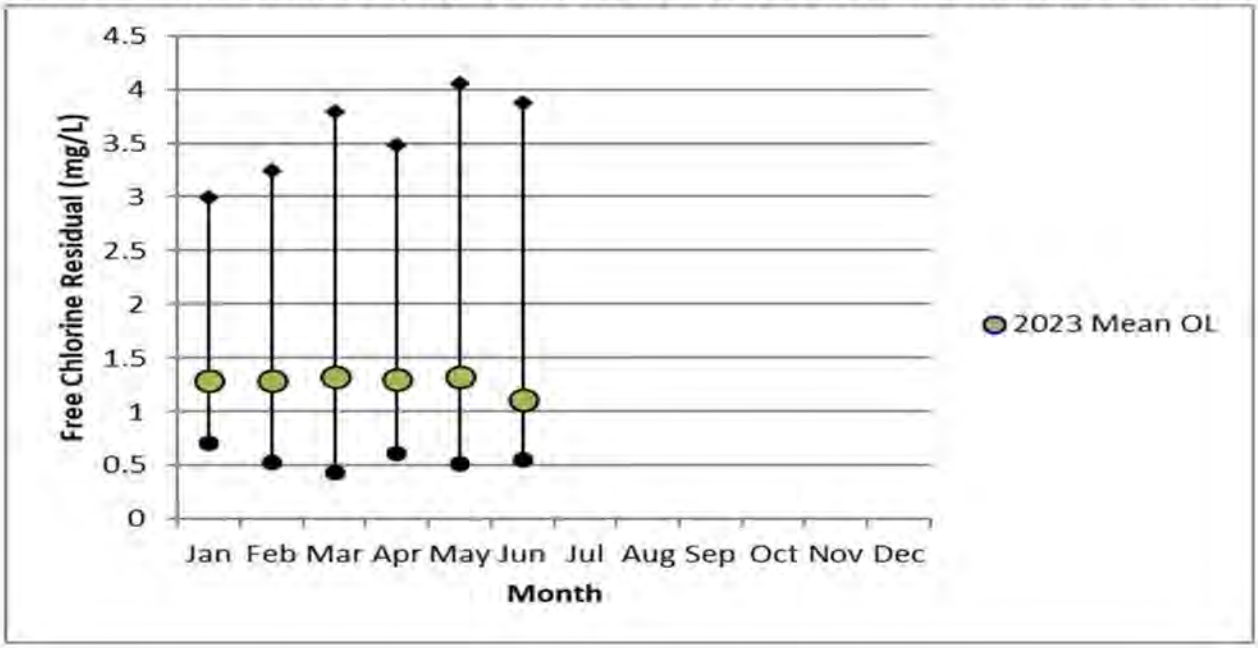


Chart 4 below provides the monthly average, minimum and maximum free chlorine residuals at the Port Burwell Tower in 2023. The residuals at the tower fluctuate depending on the fill cycles.

Chart 4. Minimum, maximum and average chlorine residuals recorded at Port Burwell Tower, 2023.

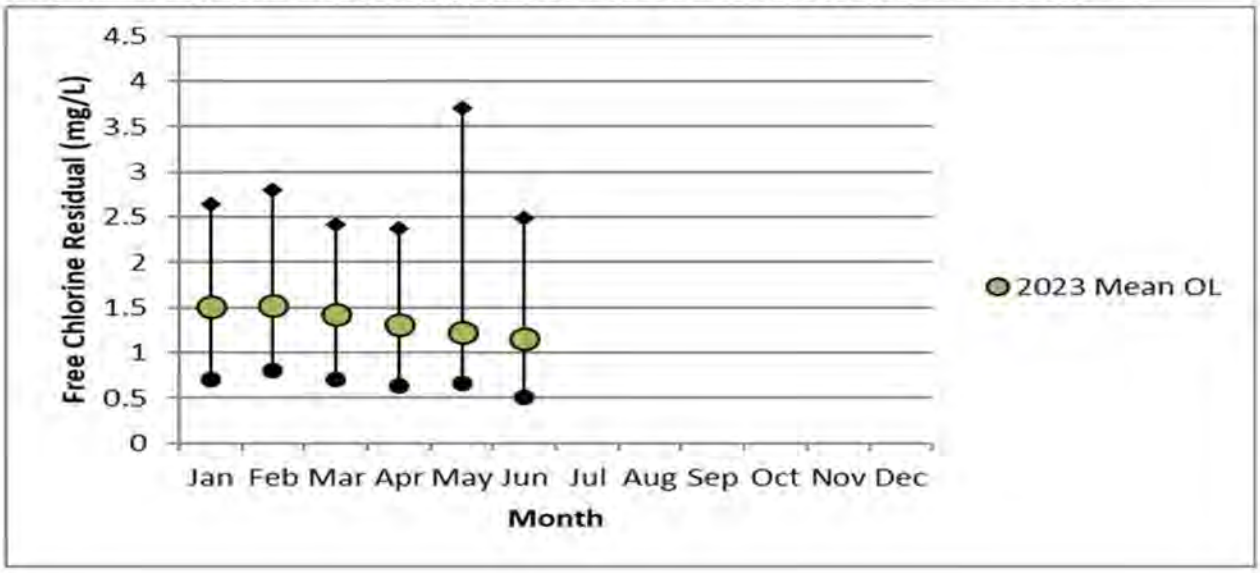
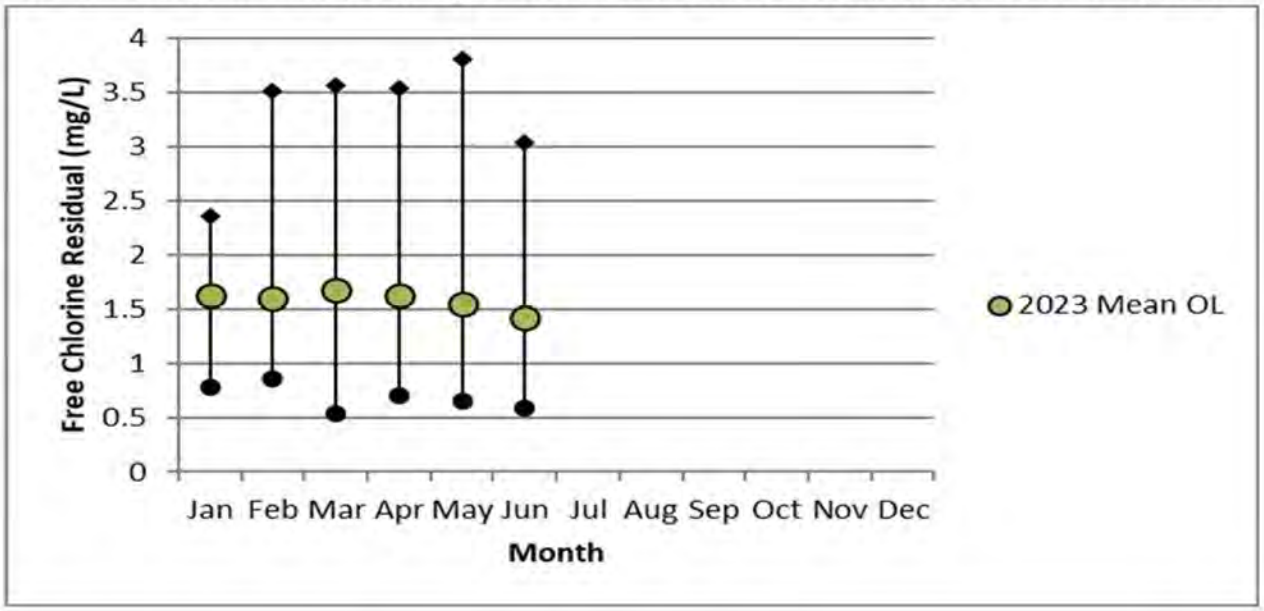


Chart 5 below provides the daily average, minimum and maximum free chlorine residuals at the Lakeview Re-chlorination Facility in 2023.

Chart 5. Minimum, maximum and average chlorine residuals recorded at Lakeview Re-chlorination, 2023.



Samples are obtained once per week at three locations in the distribution system. Table 1 summarizes the results of the microbiological sampling.

Table 1. Summary of microbiological sampling

Month	# Samples	E. coli Range (cfu/100mL)	Total Coliform Range (cfu/100mL)	# Samples	Heterotrophic Plate Count Range (cfu/mL)
January	10	0 – 0	0 – 0	5	<10 - <10
February	8	0 – 0	0 – 0	4	<10 - <10
March	10	0 – 0	0 – 0	6	<10 - <10
April	8	0 – 0	0 – 0	4	<10 - <10
May	11	0 – 0	0 – 0	6	<10 – <10
June	8	0 – 0	0 – 0	4	<10 - <10

Trihalomethanes (THMs) are sampled on a quarterly basis; the current running average is 32.00µg/L. When comparing the current running average to the 2022 average (30.75µg/L) there has been an increase of 4.1%. The results are well below the limit of 100 µg/L (refer to Table 2).

Table 2. Summary of THM sample results

	Limit (µg/L)	THM Result (µg/L)
July 2022		30
October 2022		40
January 2023		29
April 2023		29
Running Average	100	32.00

Haloacetic Acids (HAAs) are required to be sampled on a quarterly basis. The current 2023 running average is 16.03µg/L (refer to Table 3). When comparing the current running average to the 2022 average (17.2µg/L) there has been a decrease of 6.8%. The results are well below the limit of 80µg/L.

Table 3. Summary of HAA sample results

	Limit (µg/L)	HAA Result (µg/L)
July 2022		11.5
October 2022		22.6
January 2023		15.6
April 2023		14.4
Running Average	80	16.03

SECTION 5: OCCUPATIONAL HEALTH & SAFETY

FIRST QUARTER:

There were no Health & Safety issues identified during the first quarter.

SECOND QUARTER:

There were no Health & Safety issues identified during the second quarter.

ECTION 6: GENERAL MAINTENANCE

FIRST QUARTER:

JANUARY

02: Low chlorine panel pressure. No air bubbles or leaks noted. Removed inlet valve on pump 2 and noted large amount of pressure built up. Clog perhaps present. Primed both pumps. No leaks noted and confirmed chlorine entering panel from both pumps.

04: Tested flood alarms at MV1, Dexter Re-Chlor, Lakeview Re-Chlor and Port Burwell tower (tower chamber) Removed injector from main. Cleaned injector and replaced check valve. Primed line and reinstalled in main. Paused pumps and isolated Cl2 panel. Removed injector line from discharge end of Cl2 panel. Nut split and thread damage on connecting union. Removed and replaced. Pumps and panel returned to normal operation upon completion. All normal. Opened meter chamber to test alarm. 2' water in chamber. Sump pump and alarm not functioning. Chamber pumped. Confirmed water is from infiltration and not a leak in the pipeline. Confirmed failure of sump pump and outlet in chamber supplying power. Notified ORO of findings. In contact with Koolen electric to facilitate electrical repairs

05: Farmington installed new sump pump in meter pit. Remote GFI reset returning power to outlet in pit. Koolen electrical replaced float in meter pit. Tested float. Now normal

10: Section of pipe leading to eyewash station isolated removed and capped due to rupture in pipe

17: Critical alarms tested at Dexter Re-Chlor, Port Burwell tower and Lakeview Re-Chlor

19: Power failure at Lakeview Re-Chlor. Power restored before generator could be set up

FEBRUARY

02: On site at MV1 with Jutzi for Cl2 delivery

08: Tested flood alarms at MV1 and Dexter Re-Chlor

14: Tested critical alarms at Dexter Re-Chlor, Lakeview Re-Chlor and Port Burwell tower via SCADA

15: Koolen Electric on site to diagnose issue with heater. Sequencer and thermostat replaced.

21: Received alarm for power failure and UPS fault. On site to investigate. Power on. UPS at 100% charge. All normal

23: Connected generator due to power outage. Process restored. Verified analyzer. Cycled power to cellular fail overs for Lakeview and Port Burwell tower as well as the modem for Lakeview. Communication restored.
High level alarm. Tower level at 99.81% currently discharging. High level due to loss of communication at Lakeview. Site now operating normally
Summa on site at Lakeview Re-Chlor for PLC replacement

24: Slight leak on discharge of Cl2 panel at Dexter Re-Chlor. Will return to repair next week after acquiring needed parts
Found small leak on PRV at Lakeview Re-Chlor. Will repair next week as time permits
Power restored to site. Shut down generator. Reconnected all plugs to allocated outlets. Confirmed operation of site

28: PLC replaced at the Valve House. Summa stated we will need to put system on pressure mode until PLC is replaced at Port Burwell tower

MARCH

02: PLC replaced at Port Burwell Tower. Chlorine spikes between 3-4mg/l during the installation of the new PLC not reflective of the true value

03: Noticed metering valve pulsing more frequently than normal. Contacted on call operator. Trending looked unusual. Contacted client from township. Client tried closing valve remotely by adjusting pulse. No change. Switched to pressure mode from level and flow. No change. Switched to level mode. Valve closed. Client in contact with SUMMA who will continue troubleshooting remotely

08: Flowmetrix preforming inspection/ calibration of flow and pressure meters at Dexter Re-Chlor and E014
09: GFCI for sump pump at EO38 tripped. Reset. Now working normally
Flowmetrix preforming inspection/ calibration of flow and pressure meters at E038, V001, Lakeview and Port Burwell tower
Farmington mechanical replaced plumbed in eyewash station. Verified analyzer prior to repair. Flow to analyzer stopped at 10:18. Eyewash station installed and tested. Flow restored to analyzer at 11:05. Flushed air bubbles from analyzer. Verified analyzer with a grab sample 1.85 @ 11:12. All normal
Watermain break just downstream of Lakeview. PBR Excavating, CC Dance, Township of Malahide, Township of Bayham on site to facilitate repair
10: Flowmetrix completed inspection/ calibration of meters at PB01, PB02, Waneeta beach and Dexter & Imperial
13: High Cl2 alarm at Lakeview. Pump stroke reduced by 5% at Lakeview Re-Chlor, Dexter Re-Chlor and Port Burwell tower to lower residual in system
15: Tested flood alarms at MV1 and Dexter Re-Chlor
17: Completed monthly testing of Critical alarms at Dexter Re-Chlor, Lakeview Re-Chlor and Port Burwell tower
21: Replaced faulty pressure relief valve on chlorine panel at Lakeview Re-Chlor
Replaced union connecting discharge line to chlorine panel at Dexter Re-Chlor
22: Farmington Mechanical Replaced inner components of air relief valves at EO36 and EO37
30: Received chlorine delivery from Jutzi at Valve House

SECOND QUARTER:

APRIL

Completed monthly work orders, generator operation and maintenance.
04: SS#90 seal replaced by Aqua Fix on end of operating rod due too small leak. Sample station tested and returned back to normal operation.
12: Tested flood alarms at MV1, Dexter re-chlor, Lakeview re-chlor and Port Burwell tower
20: Tested critical alarms
21: Slight leak on discharge end of chlorine panel. Paused pumps and isolated panel. While unscrewing adapter chlorine was feeding back through line (did not fully remove). Tightened connection. Returned pumps and panel to normal operation. Informed OIC. Repairs to be made as soon as time permits

MAY

Completed monthly work orders, generator operation and maintenance.
02: Landmark and Corrosion Service arrived on site for tower inspection
Repaired leak on discharge end of chlorine panel at the tower.
05: Due to irregular readings began checking panel and lines. Found a large air bubble preventing dosage. On further inspection drain valve on panel was open creating issue. Closed valve. Removed compression fitting downstream of check valve on injection quill. Advanced right hand pump to prime line and clear air from line. Reapplied thread tape and reattached compression fitting. System now normal.
09: Lowered lead pump stop residual set point from 1.70 - 1.65 to help reduce max residual as per OIC
10: Tested flood alarms at Dexter Re-chlor and the Valve House
11: On site with Jutzi at Valve House for chlorine delivery
16: Farmington Mechanical on site at Port Burwell tower to replace chlorine injector port and ball valve.
17: Replaced PH probe at Dexter Re-chlor
19: Decreased pump stroke from 65-60% and increased flow through analyzer from 60-70 l/h

JUNE

Completed monthly work orders, generator operation and maintenance.

14: Flowmetrix SCG on site at E038 to replace flowmeter
15: Jutzi on site at Valve House for chlorine delivery
16: Found small leak at Dexter Re-Chlor where injector line from pump 1 connects to chlorine panel. Union and fittings replaced
20: Small crack in line found at Port Burwell tower. Damaged section of line removed. Refitted line to Pump
29: Flowmetrix SCG on site at Wanetta Dr. to replace flow meter

SECTION 7: ALARMS

FIRST QUARTER:

JANUARY

17: Received high temperature alarm for Dexter Re-Chlor. Heater malfunctioning. Turned heater off. Aired out building. Set up space heater

FEBRUARY

22: Received telephone phone call from Spectrum informing of power failure, pump 1 and 2 faults at Lakeview Re-Chlor. Chlorine analyzer reading 2.27 free ppm. ORO informed to attend site in morning to hook up generator if power remains off

MARCH

14: Received message from Execulink via call service that communication was lost. Logged onto SCADA. Confirmed communication loss. Cycled power to cellular fail over, router and modem. Indicators on devices show connectivity. Still no readings on SCADA. Contacted Execulink. They noted an odd feedback. Execulink reset switch remotely. Communication restored after a waiting period. Confirmed via SCADA. Execulink also confirmed a stable signal
18: Received call for high Cl2. Proceeded to site. Took a grab sample. False high. Calibrated. Reviewed trending. Cl2 level spiked when flow stopped. Reviewed eRIS logs. Contacted ORO. Discussed dropping pump stroke % to help stop Cl2 levels from reaching such a high level when flow stops. Reduced pump stroke from 80% to 78% as per ORO
22: High chlorine alarm at Dexter Re-Chlor. Operator confirmed a false high. Changed electrolyte in probe. Waited for stabilization. Calibrated analyzer. Now operating within 10% range
23: High chlorine alarm at Dexter Re-Chlor. Operator confirmed a false high. Changed electrolyte cap and fluid. Waited for stabilization. Calibrated analyzer. Now operating within 10% range

SECOND QUARTER:

APRIL

30: Received notification from Execulink. Communication failure at Lakeview Re-chlor. Notified that the modem needs rebooting. Received power fail alarm at Lakeview Re-chlor. Notified ORO and will continue to monitor. Spoke with Execulink telling them that I do appear to have communication they said may be due to the power outage event, they will pass along the info and call back if it's still a concern. Notified ORO and headed to site. Once onsite verified power on and communication operating normally

MAY

06: High chlorine alarm at Lakeview Re-chlor. Lowered stroke on pump from 70% to 65% to prevent any further chlorine spikes. Continued to monitor chlorine level. Cleaned and flushed sample feed line, ensured clear of bubbles.

13: High chlorine alarm at Dexter Re-chlor. Logged onto SCADA. Reading was 3.87 and dropping. Proceeded to site. Received second call while en route 18:17. Arrived on site at 18:41. Analyzer reading upon entry was 3.43. Opened sample port on analyzer. Chlorine reading plummeted. Took a grab sample as reading was dropping. Residual was above low measuring range. Analyzer stabilized at 1.04 grab sample was 0.94 @ 18:46. Immediately proceeded to hydrant downstream. Took a grab sample after pressurizing and began flushing hydrant 1.09 @ 18:58. Took six additional grab samples approximately 2-3 minutes apart. Reviewed trending on SCADA. Event happened while tower was discharging possibly causing a slug in analyzer from reverse flow. Highest reading recorded was 4.07. Contacted ORO about dropping pump stroke by 5% to combat high chlorine residual during tower discharge cycle. Returned to Dexter re-chlor and lowered stroke from 70-65% as per ORO.

18: Received high chlorine alarm at Dexter Re-chlor. On call operator on site to verify analyzer

25: Received alarms for pump 02 fault and general alarm at Port Burwell tower and UPS alarm at Dexter Re-chlor. Logged onto SCADA. Alarm UPS no longer active. Cleared pump 02 general alarm via SCADA

JUNE

11: Received high chlorine alarm at Dexter Re-Chlor. High level occurred while tower was discharging. Issue determined to be a slug in the line. Pump stroke reduced by 5% in an attempt to compensate

18: Received high chlorine alarm at Dexter Re-Chlor. High level occurred while tower was discharging. Stop set point lowered to further help reduce concentration of slug that forms when flow stops

21: On call operator contacted by SOM. Communication fault at Lakeview Re-chlor. Power cycled to router. Communication re-established

SECTION 8: COMPLAINTS & CONCERNS

FIRST QUARTER:

There were no complaints or concerns received during this quarter.

SECOND QUARTER:

On April 4th a resident complained of low water pressure. It was found that the 1" line into the house was reduced to ½" with several bends and an in-line filter. There was galvanized pieces found in the system and the customer was informed they would need to be replaced.

Aylmer Area Secondary Water Supply System

REPORT NO.: **AASWSS-23-08**

DATE: **September 6, 2023**

ATTACHMENT: **n/a**

SUBJECT: **Capital Project Update**

Recommendation:

THAT Report No. AASWSS-23-08 entitled "Aylmer Area Secondary Water Supply System Capital Project Update" be received;

Background:

The intention of this staff report is to provide an update to the Aylmer Area Secondary Water Supply System Joint Board of Management with respect to the status of Capital projects in accordance with the approved 2023 budget.

Comments/Analysis

In 2023, a variety of Capital projects were approved for the Aylmer Area Secondary System for both the Transmission main and the Elgin Middlesex Pumping Station.

The below table provides a summary on the status of currently approved capital undertakings for the Aylmer Area Secondary Water Supply System.

Item	Status
EMPS	
DWQMS Audits	Internal DWQMS Audit completed on August 3, 2023 External DWQMS Audit is scheduled for November 1-3rd (no cost yet)
Chlorinator System Repairs	Completed – Budget $2500 – OCWA invoice $2826 (slightly over budget)
Diesel Fuel	Winter Storm expenditure and invoice complete. Generator ran for extended period due substantial outage resulting from broken poles on Centennial Ave. OCWA to review fuel level in October/ November (over budget – ice storm)
Generator Load Testing	To be scheduled by OCWA in Q3/Q4 – scheduled for Fall 2023 (no cost yet)

Generator & Transfer Switch Assessment	To be scheduled by OCWA in Q3/Q4 with Load Testing
Surge Anticipating Pressure Reducing Valve Inspect/ Rebuild	Quotes requested by OCWA. Awaiting quotes before work can proceed.
Lighting Upgrades	Completed replacement of lighting in Chlorine and Generator room at the EMPS – Budget $7500, OWCA invoice $2516 (under budget)
UPS Replacements (PLC, Generator)	To be completed by OCWA. Not anticipated to have difficulty obtaining new units – not yet complete
Transmission Main	
Chamber 13 and 16 PLC Micrologix Controller Replacement	Capital project carried over from 2022 due to global supply chain issues Installation and Commissioning completed in February of 2023 (on budget)
Fire Flow Testing and Hydrant Painting as per fire flow rating	OCWA completed annual hydrant flushing and fire flow testing of all hydrant connected to Aylmer Secondary System in May 2023 Hydrants painted in July 2023
SCADA	Q1 and Q2 SCADA Maintenance including Drive Image Inspection / Validation, Disk Space Audit, PLC program backup/archival, and SCADA application backup, UPS inspection in conjunction with service agreement with Summa Engineering Ltd.
Financial	
Rate Study	Completed by Watson & Associates and presented to Board in Q1 of 2023

Summary:

The majority of Capital projects are expected to be completed within the current calendar year.

All of the projects completed in 2023 were necessary to ensure the continued safe and reliable operation of the Secondary System. In order to ensure the long-term sustainability and useful function of the Secondary System it is essential that life-cycle replacements and equipment maintenance schedules are maintained. This also allows capital upgrades to be scheduled appropriately and ensures future budgets include lifecycle replacements. Keeping the Owners informed ensures that they are aware of the maintenance needs of the water system. This allows for an effective long-term plan of the maintenance and upgrade requirements so a proactive approach can be achieved.

Submitted by:	Approved by:	Approved by:
Sam Gustavson Water/Wastewater Operations Manager	Jason Godby Director of Public Works	Adam Boylan Acting Chief Administrative Officer

Port Burwell Area Secondary Water Supply System

REPORT NO.: **PBASWSS-23-09**

DATE: **September 6, 2023**

ATTACHMENT: **n/a**

SUBJECT: **Capital Project Update**

Recommendation:

THAT Report No. PBASWSS-23-09 entitled "Port Burwell Area Secondary Water Supply System Capital Project Update" be received;

Background:

The intention of this staff report is to provide an update to the Port Burwell Area Secondary Water Supply System Joint Board of Management with respect to the status of Capital projects in accordance with the approved 2023 budget.

Comments/Analysis:

In 2023, a variety of Capital projects were approved for the Port Burwell Area Secondary System.

The below table provides a summary on the status of currently approved capital undertakings for the Port Burwell Area Secondary Water Supply System.

Item	Status
Transmission Main	
Replacement of PLC Micrologix controller at MV1 Valvehouse, Port Burwell Water Tower, Lakeview Re-chlorination Facility	Capital project carried over from 2022 due to global supply chain issues Installation and Commissioning completed in February of 2023 - Completed (on budget)
Water Tower Inspection	Landmark completed Remote Inspection and Report (RIR) services (underwater camera inspection) at Port Burwell Water Tower in May 2023 Survey of the Cathodic protections system completed by Corrosion Services at same time to allow electrode reference checks to be taken inside tank at time of drone inspection.

	Inspection Results provided to OCWA to be included in future capital recommendations. - Refer to Report 23-10 on budget updates regarding this item
Condition Assessment Pipeline	Capital project awarded in June 2023 to Xylem Pure Technologies to perform a pipeline desktop review utilizing various methods to review data and provide a forecast for the pipeline's eventual replacement historical breaks and pipeline Staff have provided pipeline data to Xylem for their review Site meeting and pressure monitoring to be scheduled with Xylem in Q3/Q4 Project completion may carry over to 2024 due to late project award
Fire Flow Testing and Hydrant Painting as per fire flow rating	OCWA completed annual hydrant flushing and fire flow testing of all hydrant connected to Aylmer Secondary System in May 2023 Hydrants painted in July 2023
SCADA	Q1 and Q2 SCADA Maintenance including Drive Image Inspection / Validation, Disk Space Audit, PLC program backup/archival, and SCADA application backup, UPS inspection in conjunction with service agreement with Summa Engineering Ltd.
Unplanned Maintenance	The board incurred some additional maintenance costs in 2023 due to unforeseen meter failures at chamber E038 (Port Burwell), Waneeta Beach Boundary meter, and PB 02 chamber (Port Bruce Boundary). Staff proceeded with replacements at the sites to ensure normal operation of the system was maintained acting in the best interest of the Board. - obtained quote ($3740 + HST) to replace roof at Lakeview from the leakage caused by antenna on roof. Arrangements being made to remove the antenna and mount elsewhere. Some additional cost to move the antenna and mount to a fixed post. To be covered by System Maintenance budget.
Financial	
Rate Study	Completed by Watson & Associates and presented to Board in Q1 of 2023

Summary:

The majority of Capital projects are expected to be completed within the current calendar year.

All of the projects completed in 2023 were necessary to ensure the continued safe and reliable operation of the Secondary System. In order to ensure the long-term sustainability and useful function of the Secondary System it is essential that life-cycle replacements and equipment maintenance schedules are maintained. This also allows capital upgrades to be scheduled appropriately and ensures future budgets include lifecycle replacements. Keeping the Owners informed ensures that they are aware of the maintenance needs of the water system. This allows for an effective long-term plan of the maintenance and upgrade requirements so a proactive approach can be achieved.

Submitted by:	Approved by:	Approved by:
Sam Gustavson Water/Wastewater Operations Manager	Jason Godby Director of Public Works	Adam Boylan Acting Chief Administrative Officer

Port Burwell Area Secondary Water Supply System

REPORT NO.:	PBASWSS-23-10
DATE:	September 6, 2023
ATTACHMENT:	Landmark Municipal Services - Port Burwell Water Tower Remote Inspection and Report, Corrosion Services Cathodic Protection Survey
SUBJECT:	**Summary of Port Burwell Water Tower Inspection**

Recommendation:

THAT Report No. PBASWSS-23-10 entitled "Port Burwell Water Tower Inspection and Cathodic Protection Survey Report" be received.

Background:

As the Board is aware, the Port Burwell Area Secondary Water Supply System (PBASWSS) elevated storage facility was repainted in 2016. The Water Tower received a one and two-year inspection as part of the overall project. The initial inspection was completed after one year in 2017. The two-year inspection was completed again in 2018 prior to the expiration of the bonds.

At that time the inspection was completed by MISCO-Mulders Inspection Services Co. Ltd. MISCO conducted an internal and external inspection of the tower as per the terms of the refurbishment contract. The Prime Contractor, RESCOM Coatings, was on-site to complete all required repairs identified through the inspection process. The internal and external coatings that were applied are expected to last 30 years before a new coating is required. Regular inspections allow deficiencies to be identified and minor coating repairs to be made. This ensures the tower has adequate protection to prevent corrosion of the steel tank.

In 2018, MISCO recommended that the tower be put on a five (5) year Condition Inspection Program and be re-inspected in 2023.

The Water Tower Inspection was included in the 2023 Capital budget and the Staff of the administering municipality obtained multiple quotes prior to awarding the work to Landmark Municipal Services. Landmark also carried Corrosion Services as sub-contractor for this project so that a cathodic protection survey could be completed at the Tower at the same time as the ROV (Remotely Operated Vehicle) Inspection.

In 2022, a new rectifier was installed at the water tower to replace the failed original unit which was no longer supported by the manufacturer. In past surveys, analysis has been limited to relying on potentials collected via the refence points at the rectifier without obtaining readings inside the tank.

Comments/Analysis

In 2023, reference electrode checks were taken from inside the tank providing a more conclusive and comprehensive cathodic protection survey. The survey found that all internal submerged surfaces in the tank are cathodically protected in accordance with established polarization criteria by NACE (National Association of Corrosion Engineers). Further information and recommendations are outlined in the attached report from Corrosion Services.

Additionally, Landmark completed a RIR (Remote Inspection and Report) of the Port Burwell water tower on the same day as the cathodic protection survey. The Landmark inspection provided several recommendations which are outlined in the attached report. Landmark indicates in the report that no immediate maintenance on the exterior or interior of the tank is required at this time. The report recommends that the tower be drained, cleaned, and re-inspected in 2026, and that any interior corrosion repairs be completed at that time.

One recommendation provided by Landmark relates to ladder upgrades identified at the time of inspection. The travelling restraint system that is currently fixed to the ladder can no longer be used as it is non-compliant with current standards. The Staff of the administering municipality have looked into this item further and confirmed that alternate climbing methods can be used to safely climb the tower using dual lanyards and the appropriate harness.

The report has been provided to OCWA as the Operating Authority for the system. The results of the inspection will be reviewed by OCWA and the Staff of the administering municipality to be considered in future capital upgrades at the tower.

Financial Implications to Budget:

This project was included in the 2023 Budget, which was adopted by the Joint Board on January 18, 2023. The budget for the project was $12,000.00. The total project cost was $8,877.28 including applicable taxes.

A portion of this cost will be reduced as the Cathodic Survey is paid for annually by OCWA in the maintenance agreement. OCWA will be invoiced approximately $3,220.00 by the Township. Therefore, the total project cost is approximately $5,700.00.

Landmark provided estimated pricing for any recommendations that were derived from the inspection process. These estimated values have been removed from the attached report as requested by Landmark for confidentially purposes.

Summary:

The applied protective coatings will provide long-term corrosion protection to the tower surfaces and ensure long term operation of the water tower.

In order to ensure the long-term sustainability and useful function of the Water Tower regular inspections are required. The routine inspection process is required to evaluate the existing condition of the water tower and to plan for repairs to cathodic protection system and applied coatings.

This also ensures future budgets allow capital upgrades to be scheduled appropriately and ensures future budgets plan for lifecycle replacements. Keeping the Owners informed ensures that they are made aware of the needs of the water system and allow for effective long-term planning of required maintenance and upgrades so a proactive approach can be achieved.

Submitted by:	Approved by:	Approved for the Board:
Sam Gustavson Water/ Wastewater Operations Manager	Jason Godby Director of Public Works	Adam Boylan Acting Chief Administrative Officer

LANDMARK
Elevating Expectations

Township of Malahide
Port Burwell Multi-Legged Tank
Remote Inspection and Report
May 2, 2023

LANDMARK
Elevating Expectations

Landmark Municipal Services

3091 Harrison Court
Burlington, ON CAN L7M 0W4
905.319.7700 Phone
905.319.7706 Fax

www.teamlandmark.com

July 11th, 2023

Township of Malahide
87 John Street South
Aylmer, Ontario
N5H 2C3

Attn: Sam Gustavson
SGustavson@malahide.ca

Tel: 519-773-5344 x226

Re: **LMS Job # 40-23-0030**
Remote Inspection and Report (RIR) – Port Burwell Multi-Legged Tank (ML)

Dear Sam,

A comprehensive inspection was performed at the above-mentioned potable water storage facility on May 2nd, 2023. Tank exterior inspection includes, but is not limited to, structural components, ladders, landings, handrails and other safety appurtenances as well as the protective coating system. Tank interior surfaces and linings were inspected with a remotely operated vehicle (ROV).
The ROV unit and tether cable were disinfected in accordance with AWWA-C652-19 Method #2 guidelines (200ppm solution) prior to entry into the tank interior. Landmark's ROV equipment is designated for potable water use only.

Please find your comprehensive report enclosed as follows:

1) Multi-legged Tank Inspection Report — Pages 1 – 5
2) Photographic Record of Report — Pages 6 – 13
   Photographs are numbered in accordance with the corresponding numbers throughout the report.
3) Protective Coatings & Linings Report
4) Quotation #23090 for all recommended upgrades and repairs
5) Corrosion Services cathodic inspection survey report
6) ROV Video and report – Electronic copy via OneDrive download

Should you have any questions or comments regarding the content of this report, please contact us at 905-319-7700.

Yours sincerely,

LANDMARK MUNICIPAL SERVICES

David Baker - AMPP Certified Coating Inspector – Level 2, CIP #329173
dbaker@teamlandmark.com

This report has been prepared by Landmark Municipal Services for the Township of Malahide in order to provide the facility owner with a detailed description of the following:

The present condition of interior and exterior coatings, any pitting and/or corrosion on the interior of the water retaining vessel, the apparent condition of exposed foundations and the status of and recommendations for upgrades on safety equipment and other facility appurtenances.

Landmark Municipal Services has not performed a design review, an ultrasonic, x-ray, or destructive and/or non-destructive testing unless stated in the report. Comments and recommendations are based on visual inspection only and represent Landmark's professional judgement in reference to industry standards and best practices. This report may be based on information provided to Landmark which has not been independently verified. Its accuracy is limited to the time period and circumstances in which it was made. It was prepared for the specific purposes described in the report.

Any estimates regarding construction costs represent Landmark's judgement in light of our experience. Since Landmark has no control over market conditions, we do not make any representations or guarantees whatsoever with respect to such estimates or their potential variance from actual construction costs or schedules. Landmark accepts no responsibility for any potential losses.

In the case of subsurface, environmental or geotechnical conditions, the report may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time. Landmark makes no other representations or warranties whatsoever and accepts no responsibility for any events that may have occurred since the report was prepared.

Fall Arrest Update

Effective December 1st, 2016, the CSA Group updated its standards relating to fall arresters and rigid rail systems. The update has resulted in the previous standard, Z259.2.1-98 (2011) (the "2011 CSA Standard"), being separated into two new standards: (a) CSA-Z259.2.4-15 (R2020) – Fall Arresters and Vertical Rigid Rails; and (b) CAN/CSA-Z259.2.5-12 (2016) – Fall Arresters and Vertical Lifelines.

The impetus for the changes to the 2011 CSA Standard was driven by an incident in which a worker was critically injured while using a rigid rail type of fall protection system in 2014 – a copy of this notice is included at the end of this report. The Ontario Ministry of Labour's investigation into the matter revealed a weakness in the design of some Class Frontal-Fixed Rail Ladder Fall Protection Systems, which may not adequately protect workers who fall backwards or who squat and roll backwards into a fall while connected by a body harness to the trolley which slides along the vertical rail.

Particular to our review of the subject potable water storage facility is CSA-Z259.2.4-15 (R2020) – Fall Arresters and Vertical Rigid Rails ("2016 CSA Standard"). Generally, the revisions included in the 2016 Standard fall into 3 categories: (i) increased compatibility requirements between fall arresters, harnesses, and vertical rigid rail systems. These changes can primarily be found in sections 4.3.5, 4.4, and 4.5; (ii) the addition of 4 new mandatory testing requirements for rigid rail systems, which can be found in sections 5.3 through 6.4; and (iii) new marking requirements in sections 7.1, 7.2, and 7.3.

As per section 5.3.1, all new testing requirements must be met in order for the rigid rail system to be certified as compliant under the 2016 CSA Standard.

Landmark has followed up with the CSA Group in an attempt to determine the status of the exiting FRL's system compliance. In the case of fall arresters and vertical rigid rails, it appears that the current system has not been certified by the CSA Group with respect to the new Standard.

Please refer to **Quotation #23090** for pricing to remove and replace the existing fall arrest system with Honeywell Safety Products – "Soll GlideLoc" which is compliant with the current Standard.

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MULTI - LEGGED TANK INSPECTION REPORT

Landmark Contract No.	Inspection Date	Last Known Inspection Date
40-23-0030	02-May-23	Unknown
Inspector	**Report Date**	**Inspected By**
N. McKinnon	11-Jul-23	Unknown

OWNER / CONTACT

Owner	**Township of Malahide**	**Contact**	**Sam Gustavson**
Project Location	Port Burwell Multi-Legged Tank	**Title**	Water / Wastewater Operations Manager
		Phone	519-773-5344 ext.226
Address	52320 Nova Scotia Line Port Burwell, ON	**Cell**	--
		Email	SGustavson@malahide.ca

TANK DESCRIPTION

Engineer	CBI / Horton	**Tank Capacity**	334,000 imp. gal.
Year Built	1971	**Roof Type**	Self supported umbrella roof
Tank Type	Multi-Legged	**Tank Diameter**	52 ft.
Dwg's Available	No	**Riser Diameter**	5 ft.
Dwg's Reviewed	No	**Grade to Bottom of Tank**	60.175 ft.
Coating System	Zinc / Epoxy / Urethane	**Tank Height**	105 ft.
Lining System	100% Solids Epoxy	**No. of Support Columns**	6
Age of Paint	7 years (Replaced 2016)	**Column Size**	32 in. dia.

REPORT SUMMARY

Repairs Made During Inspection	Photo No.	Photo No.
	--	--
	--	--
	--	--

Recommended Repairs

SITEWORKS		ACCESSORIES	
	--	Replace non-compliant ladder from grade to catwalk	50, 52
	--	Replace non-compliant ladder from catwalk to roof	67-71
		Replace non-compliant rungs to tank interior	90, 92
SECURITY		Relocate roof hatch hinges	71, 79
Install flapper / duckbill valve on overflow outlet	7	Repair / test cathodic protection system	106
	--	Hydrodynamic mixing system recommended	106
	--		--

VALVE CHAMBER / PIT		FALL ARREST SYSTEM	
Surface prep and repaint valves and piping	28-32	***Please review cover letter for latest information regarding CSA Standard CSA-Z259.2.4-15 (R2020) (Fall arresters and Vertical Rigid Rails)**	
Install dehumidifier in valve pit	28-32		
Re-route chlorine analyzer drain	10-11	Replace fall arrest rail with CSA compliant system	50, 67
Replace non-compliant ladder rungs in valve pit	27	Install 'D' ring at bottom of ladder to catwalk	49
	--	Replace corrodible 'D' rings (4 pcs)	53, 71, 79

SUPPORT LEG FOUNDATIONS & ANCHORAGE		CONFINED SPACE & RESCUE SYSTEM	
	--		--
	--		--
	--		--

SUPPORT STRUCTURE		COATING & LINING CONDITION	
*Refer to separate Coatings and Linings Report	--	*Refer to separate Coatings and Linings Report	--
	--		--
	--		--
			--
EXTERIOR CATWALK			--
Increase catwalk handrail from 36" to 42"	59-61,64-66		--
Reinforce handrail uprights	59-61,64-66		--
	--		--

Thank you for allowing Landmark Municipal Services to assist you in the maintenance of your elevated water storage facility.
To maintain the integrity of your facility we recommend that you schedule your next:

Safety Inspection and Report (SIR)	**2024**	*** Annual requirement**
Clean, Inspect and Report (CIR)	**2026**	*** Recommended**
Remote Inspection & Report (RIR)	**2029**	*** 3 years after CIR**

SITEWORKS		Photo No.
EXTERIOR VALVE BUILDING	Good	16-17
DRIVEWAY / WALKWAY	Good	3-5
OVERFLOW SPILLWAY	Good	7

REPAIRS OR MAINTENANCE REQUIRED

SECURITY		Photo No.
FENCE & GATES	Good	2-4, 6, 8-10
HATCH LOCKS	Good	71
OVERFLOW PIPE SCREEN	Coarse grating only	7

REPAIRS OR MAINTENANCE REQUIRED

Install flapper / duckbill valve on overflow outlet

VALVE CHAMBER / PIT			Photo No.
CONDITION OF VALVE CHAMBER / PIT		Damp - Install dehumidifier	28-32
CONDITION OF PIPING		Fair - Surface corrosion	28-32
CONDITION OF VALVES		Fair - Surface corrosion	28-32
VALVE PIT HATCH	*Size	24" x 24" Grating	26-27
	*Condition	Good	26-27
ARE THERE ANY INDICATIONS OF SETTLEMENT (EXTERIOR)?		No	--
IS THE CONCRETE IN THE PIT CRACKED, SPALLED OR LEAKING?		Minor cracking and spalling	28-32
IS THERE ANY INDICATION OF PIPE MOVEMENT?		No	28-32

REPAIRS OR MAINTENANCE REQUIRED

Install dehumidifier in valve pit

Surface prep and repaint valves and piping

SUPPORT LEG FOUNDATIONS		Photo No.
HOW FAR DO THE FOUNDATIONS EXTEND OUT OF THE GROUND? (Support Legs)	2" - 6"	37-42
ARE THERE ANY INDICATIONS OF FOUNDATION SETTLEMENT?	No	37-42
IS CONCRETE OR GROUT CHIPPED OR CRACKED	Minor cracks in parging	37-42
IS THE SOIL AT THE BASE SATURATED OR IS THERE PONDED WATER?	Yes - From analyzer	10-11
IS THERE ANY INDICATION OF UNDERGROUND PIPE LEAKAGE?	No	--
IS THE SOIL AT THE BASE SATURATED OR ERODED?	No	--
IS THE FOUNDATION UNDERMINED OR EXPOSED?	No	--

REPAIRS OR MAINTENANCE REQUIRED

Re-route chlorine analyzer drain

SUPPORT STRUCTURE		Photo No.
STRUCTURAL CONDITION OF WET RISER?	Good	34-35, 43
STRUCTURAL CONDITION OF SUPPORT LEGS?	Good	37-42, 47
STRUCTURAL CONDITION OF STRUTS AND COLUMNS?	Good	43-46
STRUCTURAL CONDITION EXTERIOR TANK SURFACES	Good	59-66
STRUCTURAL CONDITION INTERIOR TANK SURFACES	Good	80-97

REPAIRS OR MAINTENANCE REQUIRED

EXTERIOR CATWALK		Photo No.
CONDITION OF CATWALK FLOOR?	Fair - Minor chipping and cracking paint	59-61,63-66
CONDITION OF CATWALK HANDRAIL?	Poor - 36"- Should be 42", Needs reinforcement	59-61,63-66
CONDITION OF SPLICES, SUPPORTS AND CONNECTIONS?	Good	59-61,63-66
DOES THE CATWALK FLOOR DRAIN?	Yes	59-61,63-66

REPAIRS OR MAINTENANCE REQUIRED

Increase catwalk handrail to 42"

Reinforce handrail uprights

ANCHORAGE			Photo No.
ARE BASE PLATES DETERIORATED OR IN POOR CONDITION?		No	35-42
ARE ANCHORS, NUTS & BOLTS DETERIORATED OR IN POOR CONDITION?		No	35-42
ARE ANCHOR BOLT CHAIRS DETERIORATED OR IN POOR CONDITION?		No	35-42
ARE ANCHOR BOLTS TIGHT?		Yes	35-42

REPAIRS OR MAINTENANCE REQUIRED

ACCESSORIES			Photo No.
LADDERS	* Ladder into valve pit	Fair - Rungs only 14" wide (code is 16")	27
	* Ladder to catwalk	Fair - Rungs only 14" wide (code is 16")	50, 52
	* Ladder to tank roof	Fair - Rungs only 14" wide (code is 16")	67-71
	* Ladder - side hatch to tank interior	Poor - Not depressed centre rungs	90, 92
REST SEAT(S)		Good - 1 pc	51
ROOF HATCHES	* Size	30" Steel hatch	71, 79
	* Condition	Poor - Interferes with handrail	71, 79
VENT	* Type	16" S.S. Frost-proof Combination vent / vacuum relief	76-78
	* Condition of Screens	Good	76-78
	* Overall Condition	Good	76-78
	* Type of Vacuum Relief	16" S.S. Frost-proof Combination vent / vacuum relief	76-78
	* Are panels intact, secure & watertight	Yes	77-78
PAINT RAIL / ROOF COUPLINGS		Good - Couplings	70-74
ROOF HANDRAIL		Good	70-74
WET RISER ACCESS FROM GROUND		Good - 34" submarine style manway	34
TANK ACCESS FROM CATWALK		Good - 42" Submarine hatch	58
OVERFLOW PIPE (8" dia.)		Good	36-37
CATHODIC PROTECTION		Cathodic Technology Ltd. Impressed Current	24, 85, 107
AIRCRAFT WARNING LIGHTS		Good - LED	75
ANTENNAE	* Anchorage / Mounting	Mounted to catwalk handrail	54, 57
	* Cable Routing	Mounted to guides on leg	50, 52
	* Surveys / Warning Signage as per Safety Code 6: Health Canada	N/A	--
LIGHTNING PROTECTION		None	--
TANK GROUNDING		Inherently grounded through riser	--
MIXING SYSTEM		None - Recommended	106

REPAIRS OR MAINTENANCE REQUIRED

Replace non-compliant ladder rungs in valve pit

Replace non-compliant ladder from grade to catwalk

Replace non-compliant ladder from catwalk to roof

Replace non-compliant rungs to tank interior

Relocate roof hatch hinges

Repair / test cathodic protection system

Hydrodynamic mixing system recommended

FALL ARREST SYSTEM			Photo No.
LOCATION	**SYSTEM TYPE**	**COMMENTS**	
* TO VALVE PIT	None	Use Tripod and Mite-Evac winch	27
* TO CATWALK	Aluminum TS Rail	Replace with CSA compliant system	50, 52
*TO ROOF	Aluminum TS Rail	Replace with CSA compliant system	67-71

REPAIRS / UPGRADES OR MAINTENANCE REQUIRED

Replace fall arrest rail with CSA compliant system

TRANSFER STATION 'D' RINGS			Photo No.
LOCATION	**YES / NO**	**CONDITION**	
* AT TOP OF VALVE PIT LADDER	No	Use tripod & Mite-Evac	27
* AT BOTTOM OF LADDER TO CATWALK	No	Required	49
* AT TOP OF LADDER TO CATWALK	Yes	Replace with S.S.	53
* AT TOP OF LADDER TO ROOF	Yes	Replace with S.S.	71
* AT TANK ROOF HATCH	Yes	Replace with S.S. (2 pcs)	79

REPAIRS OR MAINTENANCE REQUIRED

Install 'D' ring at bottom of ladder to catwalk

Replace corrodible 'D' rings (4 pcs)

RESCUE PORT BASES			Photo No.
LOCATION	**YES / NO**	**CONDITION**	
* AT VALVE PIT	No	Use tripod & Mite-Evac	26
* ON CATWALK	Yes	Good	56
* AT LADDER TO ROOF	Yes	Good	79
* AT HATCH TO TANK INTERIOR	Yes	Good	79

REPAIRS OR MAINTENANCE REQUIRED

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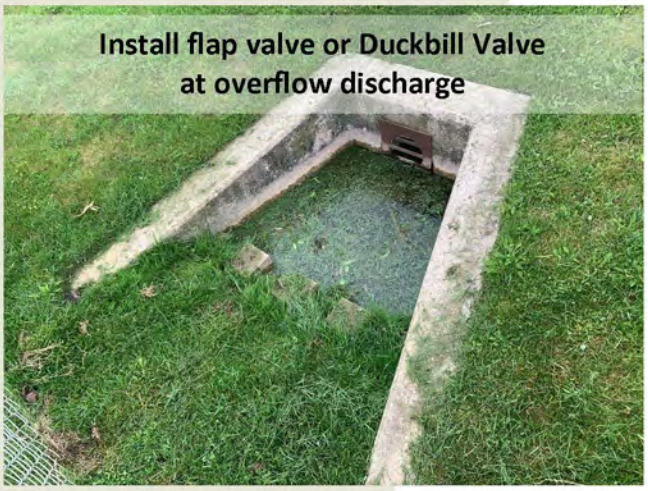
Install flap valve or Duckbill Valve
at overflow discharge

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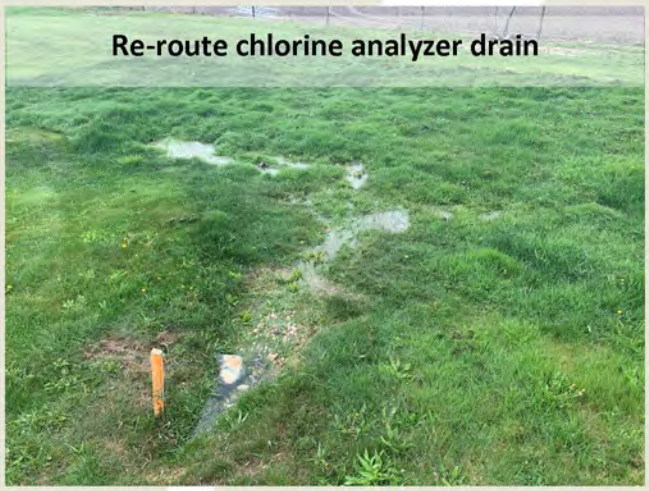

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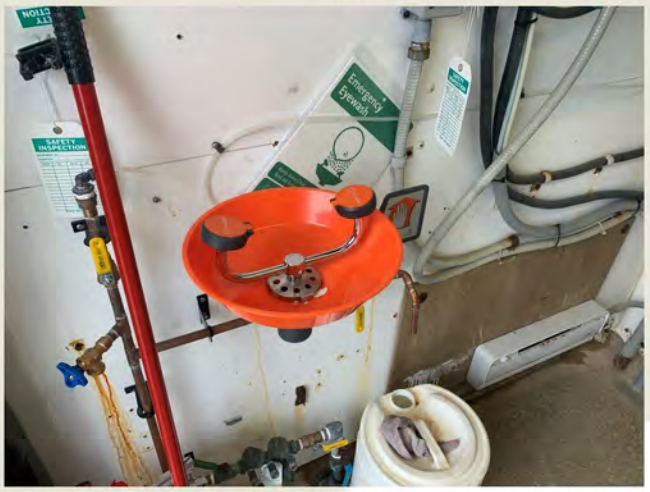

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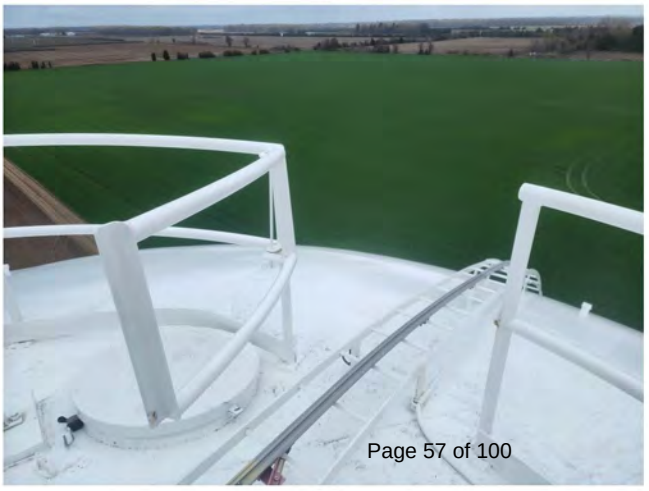

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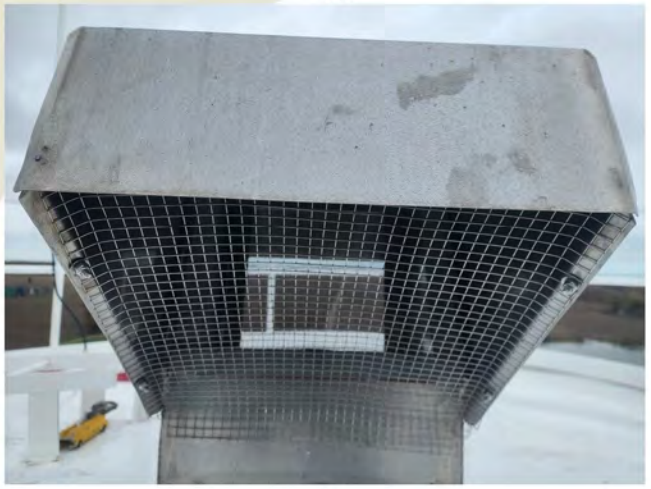

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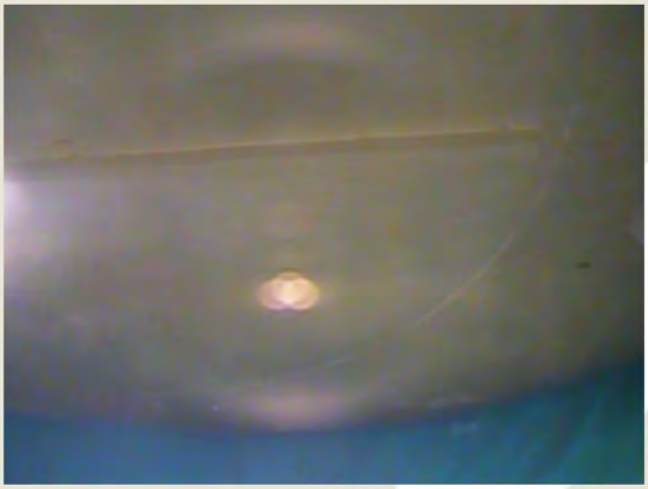

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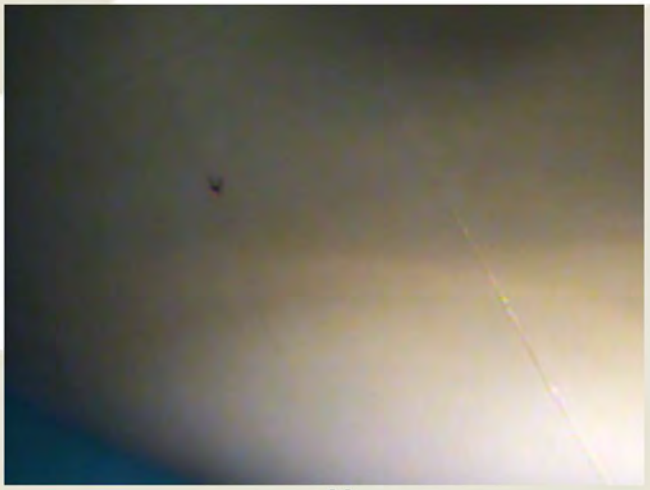

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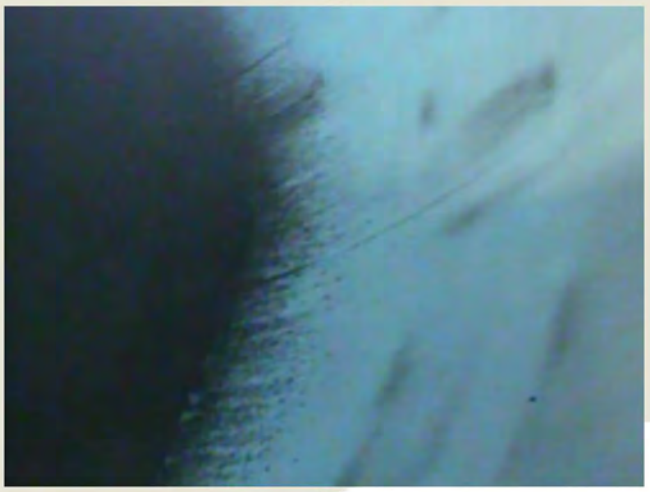

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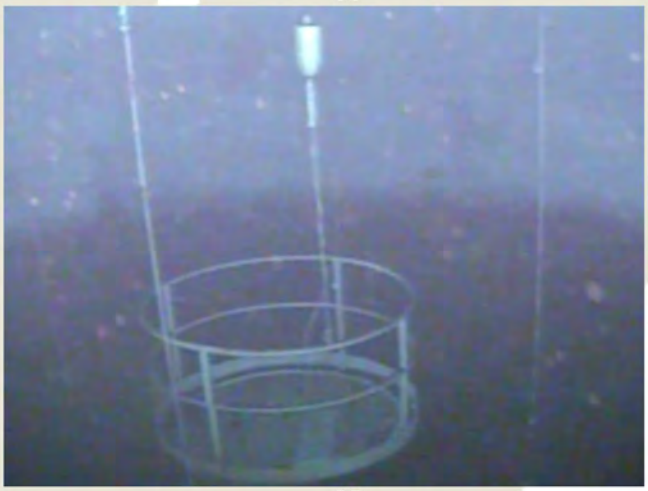

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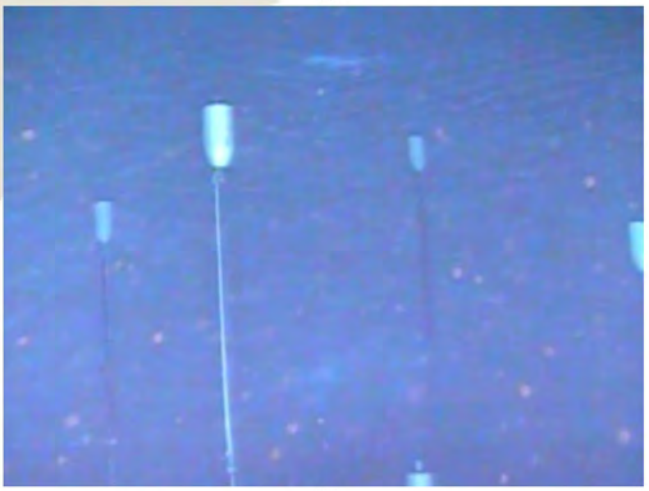

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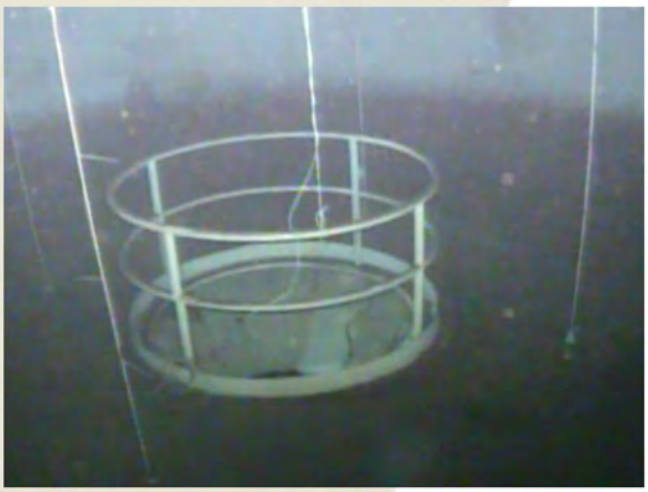

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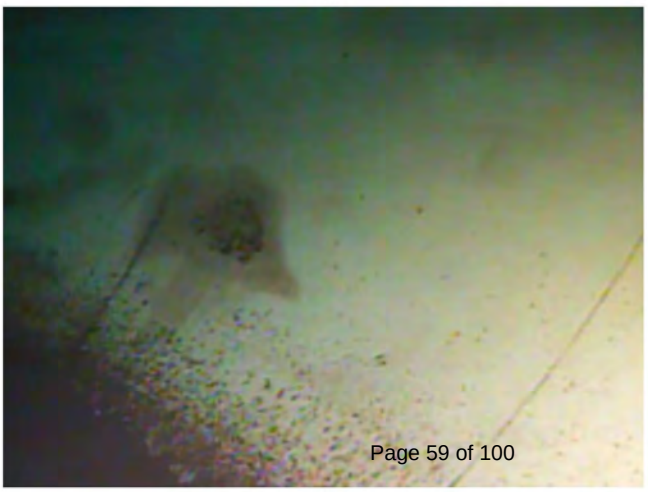

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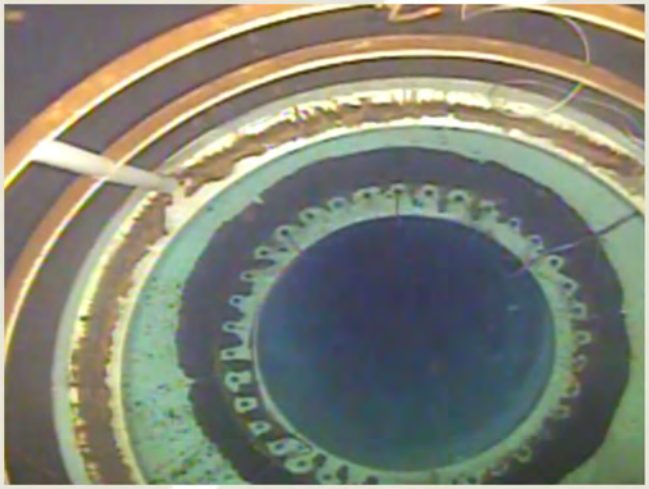

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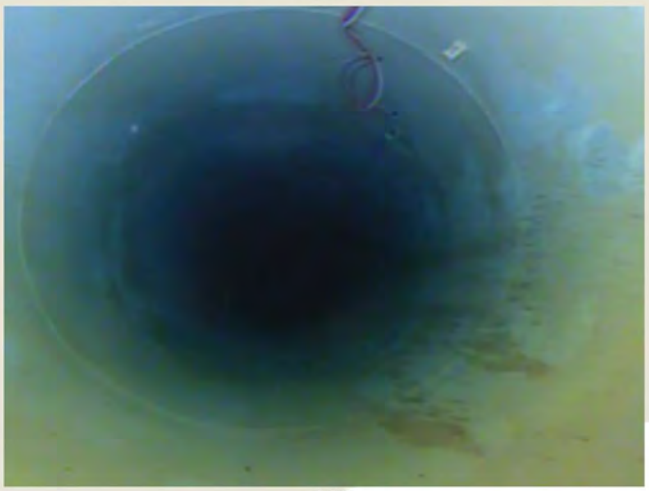

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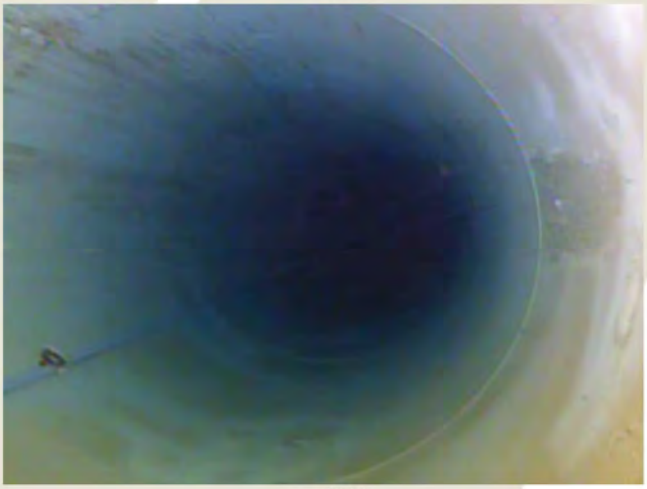

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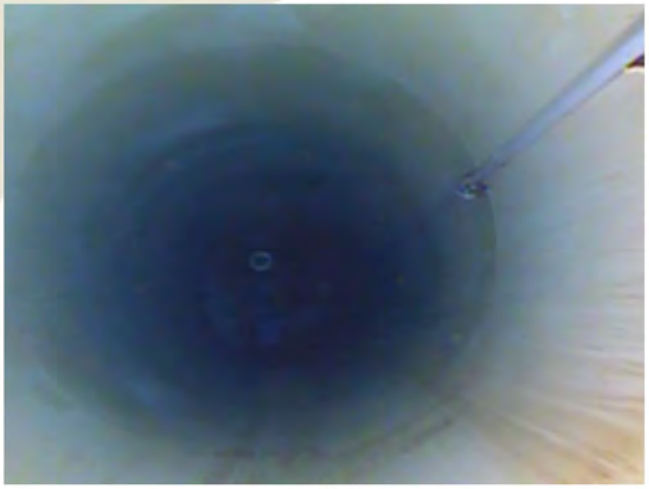

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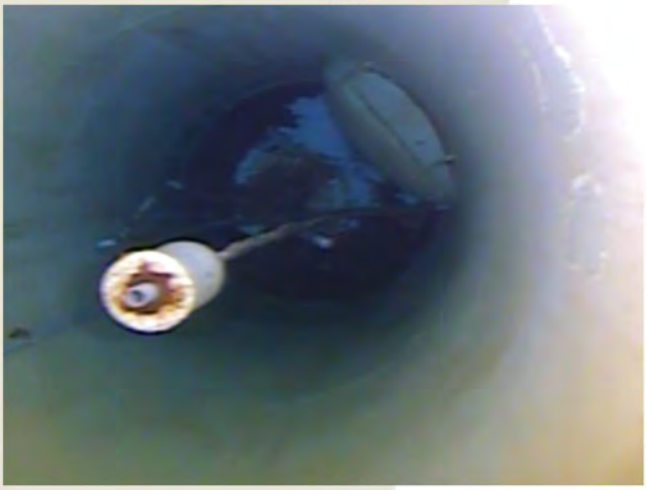

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Repair cathodic protection system. Insufficient floats on lower anode

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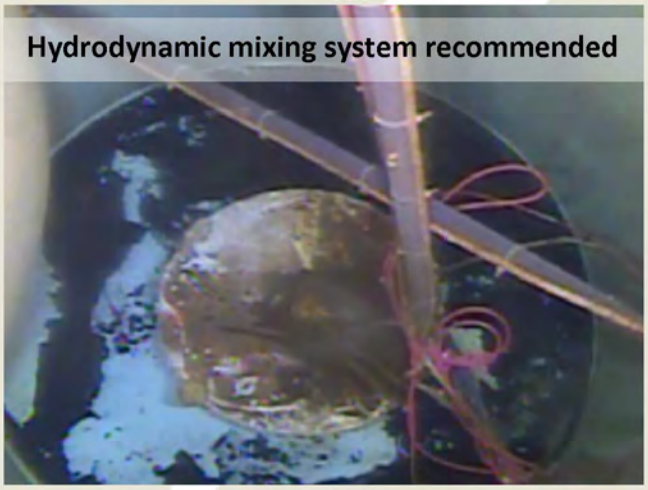

Hydrodynamic mixing system recommended

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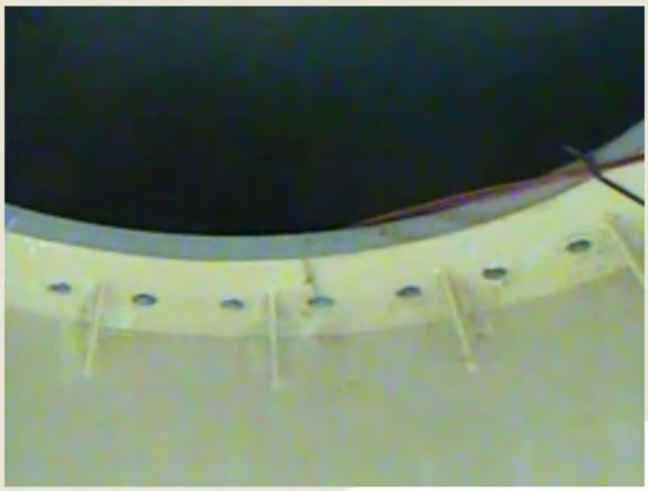

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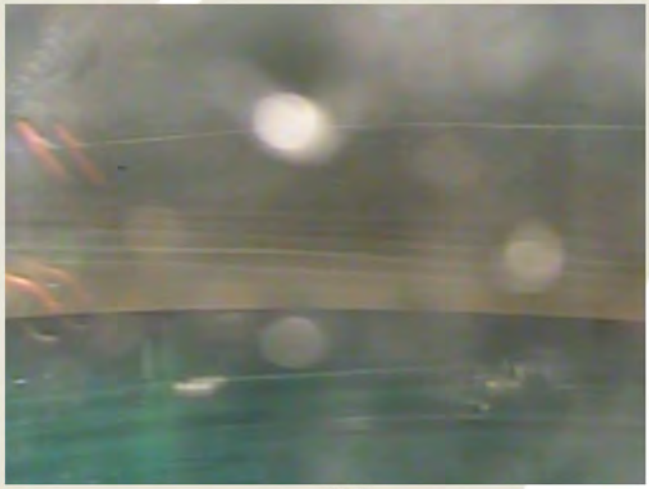

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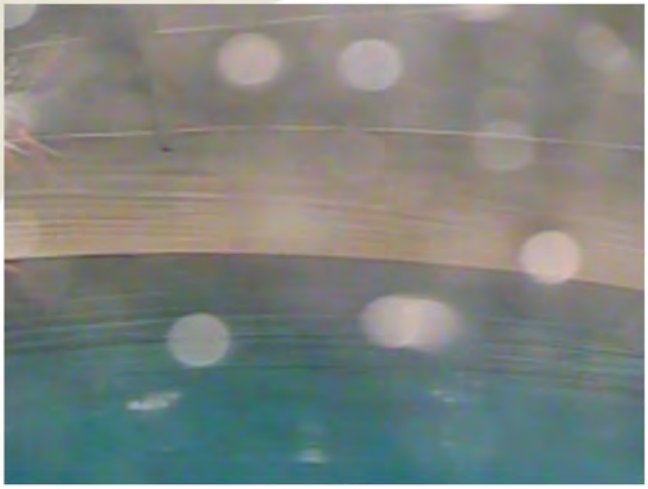

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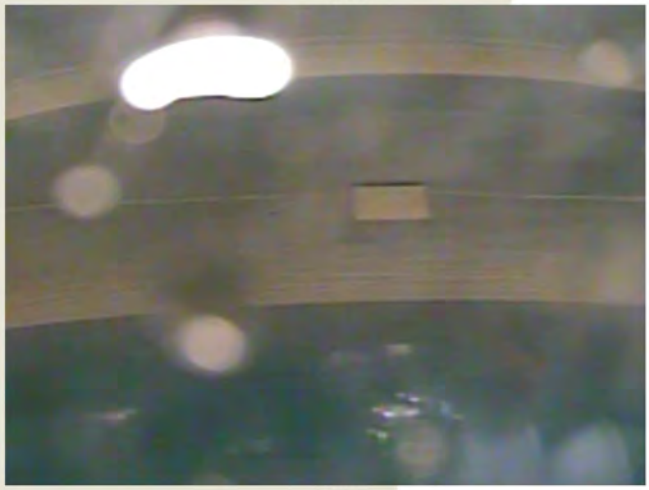

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LANDMARK
Elevating Expectations

Landmark Municipal Services

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July 11th, 2023

Township of Malahide
87 John Street South
Aylmer, Ontario
N5H 2C3

Attn: Sam Gustavson
SGustavson@malahide.ca

Tel: 519-773-5344 x226

Re: **LMS Job # 40-23-0030**
Remote Inspection and Report (RIR) – Port Burwell Multi-Legged Tank (ML)
Protective Coatings & Linings Report

Dear Sam,

A comprehensive inspection was performed at the above-mentioned potable water storage facility on May 2nd, 2023. Tank interior surfaces were inspected with a remotely operated vehicle (ROV). The ROV unit and tether cable were disinfected in accordance with AWWA-C652-19 Method #2 guidelines (200ppm solution) prior to entry into the tank interior. Landmark's ROV equipment is designated for potable water use only.

This letter is a summary of our findings and recommendations for the above noted water storage tank regarding the protective coating and lining system.

Exterior Surfaces

The exterior of this tower was repainted in 2016 with a zinc / epoxy / aliphatic urethane type of system which is in good condition. There are no signs of corrosion or delamination on the support structure or the tank itself, and the sheen level appears to be good. There is some light lichen growth on the roof surface as well as the underside of the tank belly.

There appears to be deformation of the tank shell as a result of previous ice cap formation, showing as circumferential bulges just below the upper roof knuckle. This should not affect the structural stability of the tank.

The valves and piping in the valve pit have moderate to heavy corrosion and disbondment of the existing paint.

Interior Surfaces

The interior of this tank was re-lined in 2016 with what appears to be a 100% solids epoxy type of system, which is in good condition, although there are a number of patched areas that appear to be blistering. There are no obvious signs of corrosion, band although the lower portion of the tank floor could not be inspected because of heavy sediment build up, it can be assumed to be in similar condition.

Recommendations – Exterior

The exterior of this tank is not in need of any maintenance at this time, but should be re-evaluated during the next inspection (recommended clean & inspection in 2026)

Recommendations – Interior

Although the interior lining of this tank is not in need of any immediate maintenance at this time, all corroded areas should be repaired during the next drained inspection (recommended 2026).

The inlet/outlet riser only extends a few feet from the bottom of the wet riser, which means that the last water coming in is also the first water going out. This short circuiting can lead to water quality issues, especially in the warmer months when thermal stratification occurs, as well as ice cap formation which we see evidence of. A computational fluid dynamics (CFD) analysis should be performed on this tank, taking into consideration daily flow rates, seasonal demands and average turnover, so that a hydrodynamic mixing system can be designed with the correct geometry and quantity of variable venturi duckbill valves.

Please refer to quote **#23090** for pricing.

Yours sincerely,

LANDMARK MUNICIPAL SERVICES

David Baker - AMPP Certified Coating Inspector – Level 2, CIP #329173
dbaker@teamlandmark.com
905-319-5462

LANDMARK
Elevating Expectations

Landmark Municipal Services

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July 11th, 2023

Township of Malahide
87 John Street South
Aylmer, Ontario
N5H 2C3

Attn: Sam Gustavson
SGustavson@malahide.ca

Tel: 519-773-5344 x226

Re: **LMS Job # 40-23-0030**
Remote Inspection and Report (RIR) – Port Burwell Multi-Legged Tank (ML)
Recommended Upgrades – Quote #23090

Dear Sam,

Landmark Municipal Services is pleased to provide budgetary pricing for the following repairs & upgrades at the above-mentioned potable water storage facility. *Please note that HST is not included.*

Security

1. Install flapper / duckbill valve on overflow outlet

Valve Chamber

2. Surface prep and repaint valves and piping
3. Replace non-compliant ladder rungs in valve pit(8 ft.)
4. Install dehumidifier in valve pit – plumb drain to sump pit
5. Re-route chlorine analyzer drain

Exterior Catwalk

6. Increase height of catwalk handrail from 36" to 42". Reinforce handrail Uprights. New steel to be sandblasted / painted.

Accessories

7. Ladder Upgrades:

Fixed access ladders are non-compliant to current standards whereas the rung lengths (inside to inside of side rails) are 14". The minimum required rung length by current standards is 16".

Ladder to Catwalk upgrades:

- Remove and dispose of existing 60 ft. ladder system
- Supply and Install (S&I) new 16" wide galvanized ladder system & support brackets
- Reinstate existing aluminum ladder security gate at bottom of new ladder
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops
- Install 2pc aluminum rest seats
- Install S.S. transfer 'D' rings at bottom and top of ladder (2pcs)

Ladder to tank roof upgrades:

- Remove and dispose of existing ladder system
- S&I new 16" wide galvanized ladder system & support brackets
- S&I new aluminum fixed rail fall arrest system compliant to current CSA Standards c/w end stops
- Install S.S. transfer 'D' rings at top of ladder

8. Remove and replace non-compliant rungs from catwalk manway to tank interior. (20 pcs).
   *Pricing includes all interior & exterior coating repairs

9. Relocate hinges on roof hatch (handrail interferes with hatch opening)

10. Repair & test cathodic protection system

11. Design, supply and install Hydrodynamic mixing system

    One of our tank experts would be pleased to work with you and your operations staff to better understand how the tank operates prior to finalizing our recommendation for a Tank Mixing System.

Fall Arrest and Rescue Systems – *the below items (#12,13,14) are included in item #7. If you decide to leave the ladders As-is, pricing for the Fall arrest upgrades are as follows:*

12. Remove existing fall arrest system and replace with CSA certified system

13. Install S.S. 'D' ring at bottom of ladder to catwalk

14. Replace 4pc corrodible 'D' rings with S.S. type

Quotation is confidential and shall not be distributed or provided in public bid documentation without Landmark's knowledge and written approval.

CORROSION SERVICE

Landmark Structures

Port Burwell Water Tower

Port Burwell, Ontario

2023 Cathodic Protection Survey

CJ # 21487-12

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LICENCE RBQ: 8103-2989-01

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Prepared for:

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Client Contract No. or Other Ref:

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Status / Rev.	Description	Date YYYY-MM-DD
D0	Issued for Information	2023-06-29

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Stamps:

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SURVEY RESULTS, DISCUSSION, AND RECOMMENDATIONS

Corrosion Service Company Ltd. (CSCL) was retained by Landmark Structures to perform repairs and annual cathodic protection (CP) survey on the Port Burwell Elevated Water Tank located at 52320 Nova Scotia Line (Elgin County Road #42).

Our technician conducted the annual survey on May 2nd, 2023. The survey includes taking rectifier outputs, potential readings with the permanent references connected to the rectifier, and accessing the top of the tank, and dropping a portable half-cell within the tank to collect readings. In past surveys, analysis was only limited to relaying on potentials collected via the permanent references at the rectifiers.

Based on the data collected, all internal submerged surfaces of the subject tank are cathodically protected in accordance with the -850 mV_{CSE} polarization criteria established by NACE (National Association of Corrosion Engineers) as per standard SP0169-2013 clause 6.2.1.

The system consists of two SCC215 ($25V_{DC}/1A_{DC}$) rectifiers within the rectifier cabinet. These rectifiers are set on the current control mode and were installed in 2022. The anodes were last refurbished in 2016.

All the data obtained during the survey are appended in APPENDIX A of this report.

Note for future surveys where CSCL will require access to the top of the tank, a portable ladder and safety watch/rescue plan will be required.

Picture - 1: Ladder Access To Tank

Based on the data collected during the annual survey, CSCL recommends the replacement of Reference #2. It is recommended to complete this swap during the next opportune moment, such as scheduled remedial work or a shutdown. Data collected from Reference#2 indicates that it is not calibrated and thus should not be relied on for CP status protection assessment during future cathodic protection surveys.

Corrosion Service also recommends that maintenance staff regularly (e.g., weekly or monthly) verify the ON status of the rectifier to ensure continuous operation. In addition, it is recommended to complete the next annual survey in 2024 to ensure continued system effectiveness.

Please do not hesitate to contact us if you have any questions regarding this report or any other aspect of corrosion control. Thank you for this opportunity to be of service.

APPENDIX A

Survey Data

CORROSION SERVICE

Port Burwell Water Tower
Elevated Water Storage Tank
Rectifier Data

Client:	Township of Malahide	**Survey Date:**	May 2, 2023
Location:	Port Burwell WT52320 Nova Scotia Line	**CJ Reference:**	21487-12
System:	Elevated Water Tower	**Surveyor:**	A.Pathan

New Rectifier Details:

Circuit 1	**Make:**	Corrosion Service	**Model:**	SCC25-1	**Serial:**	22RS0457
Circuit 2						22RS0458

Date	Output		Control Parameters	Hour Meter	Remarks
	Volts	mAmps			
2022-04-22	3.04	200	Current Control	-	Circuit 1 - As Left
	6.40	100	Current Control	-	Circuit 2 - As Left
2022-07-07	11.12	198	Current Control	-	Circuit 1 - As Found/Surveyed
	6.34	95	Current Control	-	Circuit 2 - As Found/Surveyed
2022-07-07	10.89	185	Current Control	-	Circuit 1 - As Left
	3.83	32	Current Control	-	Circuit 2 - As Left
2023-05-02	14.50	183	Current Control	-	Circuit 1 - As Found/Surveyed
	4.76	30	Current Control	-	Circuit 2 - As Found/Surveyed
2023-05-02	12.27	179	Current Control	-	Circuit 1 - As Left
	4.46	34	Current Control	-	Circuit 2 - As Left

Note:
- Old rectifier decommissioned and replaced with 02 new SCC rectifiersin April 2022.
- 5 new anodes and 2 references installed July 2016. System energized September 2016.
- All potentials are mV (CSE) with implied -ve polarity

CORROSION SERVICE

Port Burwell Water Tower
Elevated Water Storage Tank
Survey Data

Client:	Township of Malahide	**Survey Date:**	May 2, 2023
Location:	Port Burwell WT 52320 Nova Scotia Line	**CJ Reference:**	21487-12
System:	Elevated Water Tower	**Surveyor:**	A.Pathan

POTENTIAL SURVEY DATA HISTORY:

Reference Location	Structure Connection	Static	Survey Dates										Remarks
			2-May-2023		7-Jul-2022		22-Apr-2022		Nov-2020		Nov-2018		
			mV_{CSE}		mV_{CSE}		mV_{CSE}		mV_{CSE}		mV_{CSE}		
			On	Off	On	Off	On	Off	On	Off	On	Off	
Bottom (meters)	Tank	-	2535	1156	-	-	-	-	-	-	-	-	
1	Tank	-	2535	1156	-	-	-	-	-	-	-	-	
2	Tank	-	2536	1150	-	-	-	-	-	-	-	-	
3	Tank	-	2631	1154	-	-	-	-	-	-	-	-	
4	Tank	-	2645	1154	-	-	-	-	-	-	-	-	
5	Tank	-	2624	1160	-	-	-	-	-	-	-	-	
6	Tank	-	2614	1157	-	-	-	-	-	-	-	-	
7	Tank	-	2607	1157	-	-	-	-	-	-	-	-	
Top	Tank	-	2604	1153	-	-	-	-	-	-	-	-	
Ref. #1	Negative (Tank)	673	2556	1144	2160	1139	-	911	1074	1065	1505	1080	Riser Section
Ref. #2	Negative (Tank)	680	3462	484	3270	522	-	352	1042	975	1892	978	Bowl Section Reference #2 is unreliable for data interpretation.

Note:
- Old rectifier decommissioned and replaced with 02 new SCC rectifiersin April 2022.
- 5 new anodes and 2 references installed July 2016. System energized September 2016.
- All potentials are mV (CSE) with implied -ve polarity

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Specialty Mobile Operations

Uncompromising commitment to safety. World class technical skill. Go-anywhere mobility. Landmark delivers factory applied quality to your site.

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Developed and refined throughout 25 years of storage tank coatings and lining work, Landmark's specialty crews work wherever you need them... on projects that we design, fabricate and build, or on existing infrastructure requiring repair and recoating. The Society for Protective Coatings (SSPC) has recognized our technical skills and processes with their prestigious QP-1 certification, so you can rely on thoroughly tested multi-craft services on the most demanding jobs, with the added benefits of uncompromising safety and nationwide mobility.

We work in a wide range of applications for the private sector, the military and municipal authorities:

- Industrial facilities
- Terminals
- Petrochemical plants
- Water and wastewater
- Oil and gas exploration and production
- Aircraft fueling facilities
- Lead abatement

Safety

Safety is the Key

Landmark's uncompromising commitment to safety protects people, property and the environment. We apply equally rigorous standards for all locations, require ongoing training and testing for all crews, and utilize site evaluations, Hazard Identification and Risk Assessments (HIRA) and root cause analysis to continually drive performance improvement. Landmark employs the best available safeguards for the job, such as advanced, self-contained respiratory equipment on many applications. And we stay at the forefront of best practices and efficient reporting with our membership in ISNetworld. Core values and comprehensive safety and health programs, along with SSPC C-3 accreditation for de-leading steel structures, safeguards against environmental impact.

Skill

Landmark's technical capabilities start with specification assistance, based on in-depth knowledge of industry suppliers and their latest products, and insights from our own operations. Our crews are fully equipped to perform surface preparation and coatings work on virtually any type of steel structure, utilizing a broad array of coatings including polyurethanes, 100% solids and fiberglass reinforced systems. Our crews perform all coatings work in accordance with the Landmark Quality Assurance Manual for Surface Preparation and Coating. They are trained to implement all of the required process controls and conduct workmanship inspections to meet or exceed all applicable standards and client expectations.

Routine quality evaluations include but are not limited to:

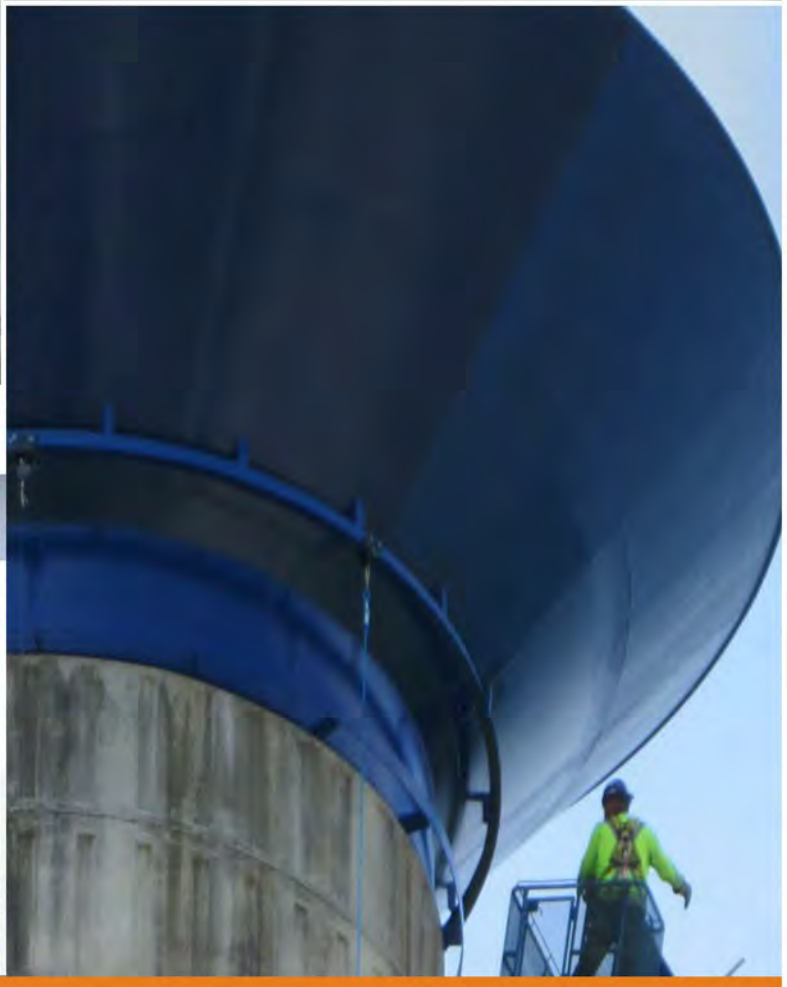
- Measurement of environmental conditions
- Verification of surface cleanliness prior to coating or lining
- Wet and dry film thickness measurement
- Holiday testing (low or high voltage, depending on lining thickness)

Daily logs track all inspection activity, and are available upon request.

Specialized equipment enables Landmark to manage dehumidification on work in enclosed spaces such as tank lining and recoating, and to protect the environment with blast media recycling and a full or partial containment on exterior surface preparation and coating. In addition, site specific plans for environmental monitoring, hazardous material management, and disposal of wastes are developed for all tank rehabilitations where existng coatings contain toxic metals. And for high-profile projects with community impact, Landmark has perfected the art of translating even the most intricate graphics to the public stage with precise reproduction. The utilization of dust collection systems ensures complete extraction of dusts for not only a cleaner surface prior to paint application, but as well as containment of dusts generated. This provides necessary air exchanges for confined space work.

Mobility

Landmark capabilities are completely mobile for deployment nationwide or beyond, without limitations. Specially outfitted trailers move containerized equipment to the project site, and then serve as mobile command centers for the crews. All required assets are at hand, coordinated with local supply lines as appropriate.



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3091 Harrison Court
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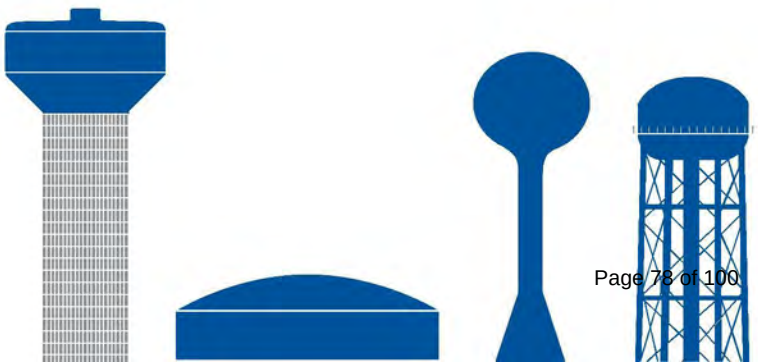
For All Types Of Water Storage Tanks



Expert inspection, maintenance, and repairs for all types of water storage tanks

- Safe, efficient, issue-free operation of your water storage infrastructure
- Full compliance with all applicable regulations across Canada

Landmark Municipal Services (LMS) brings more than 30 years of insight and innovation in water storage to owners and operators of tanks and systems of all types. Our complete range of services and packages provide predictability, continuity and flexibility for this essential function of municipal governments.

Inspections

Regular, scheduled inspections are critical for long-term efficiency. LMS conducts various types of inspections, all with comprehensive reports detailing repairs performed or recommended and upgrade requirements, with photo documentation and related cost estimates.

CIR: **Clean, Inspect & Report:** AWWA (American Water Works Association) recommends that water storage tanks be washed out and inspected on a minimum three-year cycle.

SIR: **Safety Inspection & Report:** A thorough interior and exterior review of structure and operations for compliance with applicable government regulations.

ROV: **Remotely Operated Vehicle:** ROV inspections eliminate the inconvenience and expense of taking your tank out of service. LMS provides real-time, in-water evaluations with a remotely operated vehicle.

LMS inspections provide a complete review of all critical factors:

- Site works
- Foundations
- Support structure
- Ladders/landings
- Accessories
- Valves and piping
- Metal conditions
- Exterior coatings
- Interior linings
- Antenna and communications equipment
- Safety and rescue equipment

Safety Upgrades and Training

LMS can provide safe access and rescue systems that meet or exceed the requirements of the Occupational Health & Safety Act for "vessel entry and rescue" as well as "fall arrest."



Tank Modifications

Skilled LMS professionals provide practical, proven and fully engineered modifications for all types of storage tanks, leveraging experience as one of the leading tank builders in North America. Our vertical integration adds design, fabrication and coatings expertise when needed, with single source management and responsibility.



Coatings and Linings

LMS services include all surface preparation and recoating of all interior and exterior areas. Options range from spot preparation to total blast cleaning with full containment for environmental protection. All lining materials applied to interior surfaces are ANSI and NSF 61 approved.



Safety is the Key




Inspections:

- Clean, Inspect & Report (CIR)
- Safety Inspection & Report (SIR)
- Remotely Operated Vehicle (ROV)

Safety:

- Confined space
- Fall arrest
- Training

Maintenance:

- Tank Asset Management Program (TAMP)
- Annual programs
- Coatings/linings

Lightning Protection:

- Design
- Installation
- Inspection

Antenna and Communications Systems

- Design
- Structural fabrication & installation
- Inspection

Demolition

- Partial
- Total

Modifications

- Engineering
- Tank hydrodynamic mixing systems
- Site works
- Balconies/handrails
- Manholes
- Hatches
- Venting and vacuum relief
- Welding and fabrication
- Electrical/instrumentation
- Heat trace
- Insulation and cladding
- Security systems

Landmark delivers consistent, high quality results.

Contact us today to discuss the best solution for your next project.

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Website: www.malahide.ca

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Henry Huotari
Associate, Senior Project Manager
R.V. Anderson Associates Limited

Sent via email: hhuotari@rvanderson.com

RE: Highbury Avenue Widening Class Environmental Assessment (EA)

Dear Mr. Huotari,

The Aylmer Area Secondary Water Supply System (AASWSS) transmission watermain is located in proximity to the subject lands for the proposed Highbury Avenue Widening Class Environmental Assessment (EA) being undertaken by the City of St. Thomas. The transmission main provides potable water and fire protection to residents within the Municipality of Central Elgin, Malahide Township and the Town of Aylmer. The 3 municipalities jointly own the system which is administered to through AASWSS Joint Board of Management. The Township of Malahide is the administering Municipality for the Joint Board of Management.

As the administering municipality acting on behalf of the AASWSS, we are requesting that the AASWSS be included as a contact agency for the EA Study. The AASWSS will have interests with the potential impacts of the proposed work in proximity to the existing transmission water main. These concerns include but are not limited to potential disruption or damages to the existing watermain, access for future maintenance and potential economic burden to the users of the water system relating to these items.

Sincerely,

Jason Godby
Director of Public Works

Cc: AASWSS Joint Board of Management Members
Adam Boylan, Interim CAO, Township of Malahide
Allison Adams, Manager of Legislative Services/Clerk, Township of Malahide
Sam Gustavson, Water/Wastewater Operations Manager, Township of Malahide
Nathan Bokma, Manager of Development and Compliance, City of St Thomas

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David O'Gorman
Consultant Project Manager
Arcadis IBI Group
350 Oxford West Suite 203
London, ON N6H 1T3

Sent via email: David.OGorman@ibigroup.com

RE: Major Arterial Roadway (MAR) Connection Municipal Class Environmental Assessment (EA)

Dear Mr. O'Gorman,

The Aylmer Area Secondary Water Supply System (AASWSS) transmission watermain is located within the subject lands for the proposed Major Arterial Roadway Connection Municipal Class Environmental Assessment (MCEA) being undertaken by the City of St. Thomas. The transmission main provides potable water and fire protection to residents within the Municipality of Central Elgin, Malahide Township and the Town of Aylmer. The 3 municipalities jointly own the system which is administered to through AASWSS Joint Board of Management. The Township of Malahide is the administering Municipality for the Joint Board of Management.

As the administering municipality acting on behalf of the AASWSS, we are requesting that the AASWSS be included as a contact agency for the MCEA Study. The AASWSS will have interests with the potential impacts of the proposed Major Arterial Roadway Connection which will require the proposed road to cross over the existing transmission water main. These concerns include but are not limited to potential disruption or damages to the existing watermain, access for future maintenance and potential economic burden to the users of the water system relating to these items.

Sincerely,

Jason Godby
Director of Public Works

Cc: AASWSS Joint Board of Management Members
Adam Boylan, Interim CAO, Township of Malahide
Allison Adams, Manager of Legislative Services/Clerk, Township of Malahide
Sam Gustavson, Water/Wastewater Operations Manager, Township of Malahide
Nathan Bokma, Manager of Development and Compliance, City of St Thomas

UNIVERSITY of GUELPH

SEMI-STRUCTURED INTERVIEW RECRUITMENT SCRIPT

Project Title:
Interlocal Agreements and Collaboration: Governance means and models within and between municipalities.

Principal Investigator:
Duncan J. Goetze
School of Environmental Design and Rural Development
University of Guelph

REB # 23-05-006

TO: Representatives and Important Figures Associated with the Lower and Single-Detached Municipalities of Elgin County,

FROM: Duncan J Goetze (Graduate Student, Principal Investigator)

Subject: **Invitation to Participate in the interview component of the *Interlocal Agreements and Collaboration* project.**

Hello, **[NAME]**,

My name is Duncan Goetze and I am a graduate student at the University of Guelph working under the supervision of Dr. Sheri Longboat.

Interlocal agreements to share and collaborate on water services, infrastructure, and staff have become an increasingly important and effective tool used by Ontario municipalities. Some academic literature exists on the subject, but research is limited about how different mechanisms of governance are used by governments, institutions, and stakeholders to assure all participants of an interlocal agreement are fairly respected in the agreement, and how the principles of good governance are upheld (public participation, accountability, respect for the rule of law, and transparency).

Data internal to the Ministry of Municipal Affairs and Housing shows that Elgin County and its neighbours have an uncommonly intensive network of interlocal water agreements. By understanding how relevant governing mechanisms function within and between the municipalities of Elgin County, or municipalities outside it, there is a potential to refine the existing interlocal literature by adding granular understanding of inter- and intra-municipal governance models, and thereby reveal advantages and disadvantages of interlocal agreements to municipalities.

The outcome of this project will take the form of a case study that examines the granular relations between municipalities, service providers, and the public. Depending on the number of participants, it may allow for comparisons between municipalities or communities. The focus of this project is on the already intensely collaborative Elgin County, which has shown early interest in participating in this project.

Considering your experience and role within your organization, we believe this work would be greatly enhanced by the inclusion of your insight and perspectives. Your knowledge and experience will be used to augment data acquired through the Ministry of Municipal Affairs and Housing and contribute to the study of local governments in Ontario, explaining differences between governance structures as used by municipal governments and their associated strengths and weaknesses.

Participation in this project is entirely voluntary. If you decide to participate, the semi-structured one-on-one interviews will be approximately 1-2 hours in length with flexibility to provide additional details. I am providing a document including interview questions for your reference. Interviews will be conducted through videoconferencing applications (e.g. Zoom or Microsoft Teams by interviewee preference) and recorded then transcribed.

If you are interested in participating in the semi-structured interview, please respond directly to Duncan Goetze at dgoetze@uoguelph.ca or by phone: 226-979-8777. We hope that you will be able to join!

With warm regards,

Duncan Goetze
Graduate Student, dgoetze@uoguelph.ca
School of Environmental Design and Rural Development
University of Guelph
Guelph, Ontario, Canada, N1G 2W1

Dr. Sheri Longboat, slongboat@uoguelph.ca
Principal Investigator
Associate Professor,
School of Environmental Design and Rural Development
University of Guelph
Guelph, Ontario, Canada, N1G 2W1

Please address any questions about ethical concerns and your rights as a project participant to:

Katelyn Wadleigh
Manager, Research Ethics
kwadleig@uoguelph.ca
reb@uoguelph.ca
(519)824-4120 extension 56606

Project Information and Informed Consent Statement

Semi Structured Interview

You are invited to participate in the Interlocal Agreements and Collaboration project to gather insight into governance means and models that operate within and between municipalities participating or abstaining from interlocal agreements.

This project has been reviewed by the Research Ethics Board for compliance with federal guidelines for research involving human participants.

Project Title	**Interlocal Agreements and Collaboration: Governance means and models within and between municipalities.**
Co-Investigators	**Duncan Goetze**, Graduate Student, University of Guelph, 50 Stone Rd E, Guelph, ON School of Environmental Design and Rural Development dgoetze@uoguelph.ca 226-979-8777 **Dr. Sheri Longboat**, Associate Professor, University of Guelph, 50 Stone Rd E, Guelph, ON School of Environmental Design and Rural Development slongboat@uoguelph.ca 519-824-4120 ext. 52138
Research Team Members	See Co-Investigators.
Project Duration	**September 2023—December 2023**
Funding	**Unfunded**
REB#	**23-05-006**

Background Information

Contemporary research on interlocal agreements focuses on describing socio-political and geographic factors that predict the likelihood of local government participation. Published research rarely discusses the resultant effects of interlocal agreements and lacks granular data necessary to describe the means and effectiveness of inter- and intra-local governance—which is exaggerated in the understanding of non-government institutions. A sufficiently detailed study would yield actionable recommendations for local governments or a thorough understanding of Elgin County and its lower-tier municipalities that will prove useful for both the County municipalities themselves and other municipalities considering interlocal agreements of a similar nature.

With reference to outlined research gaps, the proposed study is to investigate the institutions and means of governance at play in Ontario local governments with respect to interlocal water agreements and their effects. This project seeks to survey Ontario municipalities and other local governments to understand governance models and their effectiveness given municipal contexts. What governance models are consistently employed successfully (or not) with their neighbours to create interlocal water agreements? Are governance models consistent across Elgin County, or other municipalities that use interlocal agreements, or is there a diversity of governance that results in the same tendency to collaborate interlocally? Useful recommendations can be made on the understanding of governance models to assist local governments in future decisions to participate or abstain from interlocal cooperation on water services, or what models should be adopted as per their use case.

Project Goal

The goal of this project is to perform a case study of Ontario municipalities that use interlocal agreements in the delivery of water services to residents and understand how these interlocal relationships are governed by way of agreement drafting, debate, approval, and administration. These agreements may be influenced by or create governance models of water services and utilities; understanding those models and their successes or challenges in the field will be useful to government and corporate persons. By extension, this project's findings will be useful to municipalities actively refining their interlocal agreements, minting new agreements, or justifying the continued abstinence from agreements.

Through Semi-Structured Interviews we will collect information to collect knowledge which will contribute to:

- Understanding inside municipal perceptions of interlocal agreements;
- Detail governance models employed by municipalities;
- Better understand the individual roles played by elected councils, departments, boards, individuals, corporations, and non-governmental institutions.

Financing

This project is not financially supported.

Methods

I am using a case study approach to investigate interlocal agreements and collaborative governance thereof in Elgin County and other West Ontario municipalities as participation allows. The choice primary research method is one-on-one semi-structured interviews, allowing participants to ask for clarification of questions and answer freely without the constraints of multiple choice questions. Follow-up research on municipalities will allow for further details to be collected regarding what participants were willing to share, or fill in gaps identified in the interview results. Interviewees will be restricted to those 18 years

old and above, and are eligible to participate in sharing their experiences and opinions where employee contracts or outstanding ethical obligations are concerned.

Interview Process

Semi-Structured Interviews are planned to be approximately **1-2 hour(s) in length** and will be conducted via videoconferencing software or in person as necessary. In accordance with the University of Guelph Computing and Computer Science requirements, interviews will be conducted through either Zoom, Microsoft Teams through a UoG SSO account. A recording of the interview will be taken by the video conferencing software and then transcribed by Duncan Goetze and encrypted on an external drive.

You (the interviewee) will be asked questions relating to your expertise and experiences regarding interlocal agreements and collaboration processes undertaken by your municipality or potentially its partners (or lack thereof). **Before the interview, you will be given a list of interview questions for your review.** The interviewer may frequently ask for additional supporting documentation that can be cited in the finished project. Also, please do not feel that you as the interviewee are obliged to answer all questions to the fullest extent possible. You are not required to supply this information, however, it is helpful towards fulfilling the goals of the project. You may also suggest additional interviewees to the researcher. This process is referred to as "chain referral recruitment" or "snowball referral recruitment." Please note that to maintain information security and to avoid unpleasantries you will be asked to refer the researcher's contact details to the potential interviewee. The researcher does not have authorization to cold call additional interviewees.

After the interview, the interviewee will be asked to verify a transcript of the interview for accuracy and be given the opportunity to either redact content or withdraw from the project. Transcripts will be completed within 48 hours of the interview. Interviewees will be reminded bi-weekly (every two weeks) until the cut-off date to withdraw from the project, November 1st. If verification is not granted, the interview transcript will not be used in the study and be destroyed immediately upon November 1st.

You are not required to participate in this research project. There is also no compensation for participating in this project. To participate in this research project, you must consent to be interviewed. Consent will be recorded through an electronic form prior to the interview itself and re-confirmed verbally prior to the interview. You may choose to withdraw consent from the project and remove your contributions at any time before the 1st of November, 2023 If you withdraw consent to participate in the study, then your responses will not be used in the project and any responses or data collected will be destroyed.

Risks of participating in this project

Participation is voluntary and requires consent to participate with recognition that some limited risks are inherent in this research project.. Interview content will always be anonymous and any mentioned personal details, proper names, and workplace descriptions will be redacted from the interview transcript. To further reduce the risk of the interviewee's anonymity being compromised, no direct quotes from the interview

transcripts will be used in the finished project. Please be advised that employers or organizations could take offense to your opinions and seek to retaliate; these measures are intended to safeguard participants against that possible outcome.

As stated above, it is possible that interview questions touch on information subject to non-disclosure agreements or other forms of legal secrecy. This topic is repeated here to underscore the importance of maintaining document control and the confidentiality of sensitive information. Please exercise caution with respect to any non-disclosure contract or sensitive information not intended for public dissemination; you are never required to disclose any information, sensitive or not.

You might find answers to questions challenging to source, or alternatively banal and uninteresting to discuss. While this research project does not focus on emotionally charged subject matter, it is conceivable that some questions will touch on a sensitive subject unknown to the researchers. If you feel at all uncomfortable during the semi-structured interviews then you may pause the interview or withdraw consent. You are not obligated to provide any specific information and are only asked to share information you believe and feel appropriate.

By your discretion, individual questions may be stricken from the interview questions list. You may withdraw partial consent for the interview and strike any question(s) for any reason and without consequence. You are encouraged to strike questions wherever they request documents or information that is deemed sensitive in nature or subject to document control through confidentiality agreements or policies.

Please be aware that the researcher is not necessarily informed on the contents of municipal or corporate confidentiality agreements, internal document handling processes, or the confidentiality of internal communications or documentation. There is no consequence for withdrawing partial consent or total consent to participate in the study.

During the interview, do not share information that is subject to document control or is sensitive in nature; do not share information that you judge may result in retribution, retaliation, or punitive measures by your employer or another authority or individual.In the case of research outcomes being published elsewhere you will be notified prior. After any interview you consent to take part in, you will be asked to review a transcript of the interview for accuracy and faithful representation. You may amend your responses to the interview in transcript as necessary or rescind your consent for researchers to include those responses in the research project.

Please note that legal precedent exists in Canada for a researcher to be subpoenaed to testify in court regarding their research. While rare, a risk exists that a future court of law will require researchers to testify as to the content of the data or material you provided in this study.

You do not waive any legal rights by agreeing to take part in this study and no representative of this study will ever ask you to do so.

Benefits of participating in this project

There will be no direct benefit to participants other than the finished research project in a publicly available electronic format and the opportunity to provide input into understanding interlocal agreements and collaboration. You will be provided project results and output publications if you chose to be added to a mailing list. The project's analysis and findings could inform future municipal planning decisions where interlocal interests and collaborative potential is concerned.

Confidentiality

Your name will not be released in connection to this project unless you give permission, conforming to the ethics guidelines of the University of Guelph. Those who wish to remain confidential will not be named at any point. No quotes from interviews will be used in the final project. All proper names, descriptions of people or employers, and identifying information will be redacted from interview transcripts. Only the primary researchers and the graduate student will have access to interview recordings, and transcripts. After interviews are conducted, original documents will be destroyed and only anonymized responses retained beyond the duration of the project. All primary research data from this project will be destroyed within 5 years.

Retention of Information

Directly identifying information such as names, contact details (email, phone numbers), and place of employment will be retained only for the duration of the project and only as contact data on an external, encrypted drive. Interviewees will be assigned a number for internal use regarding the organization of interview materials. This number will not be shared with interviewees, other researchers, or other persons. Contact information will be retained only for the purposes of conducting the interview, verifying its contents, and facilitating interviewee requests.

Redacted interview transcripts returned to you for your revision and verification. All original written and typed recordings of the semi-structured interviews will be stored in locked cabinets or on encrypted computer drives in the home office of Duncan Goetze. They will be retained until the end of the research project December 31, 2023, after which they will be destroyed. The information collected during semi-structured interviews may be used for academic publications and educational purposes. You will be given an opportunity to withdraw your data up to 2 months before the end of the project. November 1st will be considered the last day to withdraw consent from the study project.

Uses of Information

Information gathered from the semi-structured interviews will be disseminated via email where requested. Information may be reproduced in whole or in part through publication in the research project, peer-reviewed journals, conferences, and presentations.

Results, Sharing of Results with Participants

A final report of the project findings will be provided to project participants. The participants will also be provided the opportunity to receive potential publications that emerge from the project.

What are the next steps?

Please see on the next page the Statement of Informed Consent. We encourage you to read this in detail and make note of any questions that arise. If you agree to participate in semi-structured interviews, we will review together the Statement of Informed Consent to be sure all of your questions, concerns or comments are addressed in advance.

On behalf of myself and fellow researchers, thank you for your participation!

School of Environmental Design and Rural Development
50 Stone Road East
Guelph, Ontario, Canada N1G 2W1

Statement of Informed Consent

	Yes	No
Confidentiality Do you grant the University of Guelph researchers' permission to use your direct identifiable information (e.g., names, community positions, titles) in community feedbacks, theses, reports and publications? If no, your data will be anonymized during the project.		
Recording of activities Do you grant the University of Guelph researchers' permission to record the activity through:		
Written modes? (Hand-written notes, typed notes)		
Recording modes? (Recording of interviews through audio recording devices, video conferencing recordings that include sound and video)		
Permission to (re)contact you Do you grant the University of Guelph researchers' permission to (re)contact you for transcript accuracy and/or to request clarification?		
Research Papers and Publications Do you desire a copy of the research outcomes and related publications? Please indicate "yes" or "no." If "yes," please provide the email address you wish to use to receive research communications. **Email:**		

Participant – Printed Name	Participant – Signature	Date

This project has been reviewed by the Research Ethics Board for compliance with federal guidelines for research involving human participants. If you have questions regarding your rights and welfare as a research participant in this study (REB#), please contact: Manager, Research Ethics; University of Guelph; reb@uoguelph.ca; (519) 824-4120 (ext. 56606) **UPDATE AS NEEDED**

School of Environmental Design and Rural Development
50 Stone Road East
Guelph, Ontario, Canada N1G 2W1

Questionnaire

Notes

ILA, Inter-local agreement

Recurring Questions: In order to maintain interviewee anonymity, direct quoting from the interview transcript will not be present in the finished project. A short list of recurring questions is presented as a general provision in this document (See: Recurring Questions).

Conceptual Questions

Questions to organize the thought process behind the *Interview Questions*, not intended as questions to be asked of interviewees.

Q1. Research Question: **How are interlocal water agreements influenced by issues pertaining to *governance*?**

a) Topics:

i) Intra-municipal politics and governance issues

ii) Inter-municipal or inter-institutional topics

iii) Stakeholders, non-governmental organizations

Q2. What are these municipalities, counties, or regions different from one-another?

a) And does their preferred mode of governance meaningfully inform interlocal cooperation on water services?

Q3. What makes Elgin County different from other areas that could explain the frequency of interlocal agreements seen there?

a) Do these regions share a functionally interchangeable set of municipal structures and water-concerned institutions, or are the lower and single-detached municipalities in the Elgin County area non-comparable?

Interview Questions

- Please note, some of these questions might be unanswerable. It seems that the municipalities do not always assign ILAs in whole to one specific department or person.
    1. I have already encountered the problem that different municipalities have assigned ILAs to different departments. Some planners have referred me to the infrastructure/utilities departments within the municipality.
    2. As such some questions are not tailored to "planners" or "utilities managers," etc, because ILAs are not always handled by the same role.
- **Interviewee-specific questions**
    1. What was your specific role?
    2. How do you fit into the chain of authority?

3. Are ILAs your responsibility at [employer] or are you involved in the ILA process in a limited way?
4. How long have you worked in this role?

- **Municipality-specific questions**

  These questions give context to how a municipality "thinks about" interlocal agreements.

  1. What motivates a municipality to enter an interlocal water agreement?
     - In a general sense, are ILAs *necessary*, *desirable*, neither, or both?
  2. Does [municipality] have any water-related concerns that contextualize its water service and resources management practices?
     - Environment: Drought, floods, ice jamming, etc.
     - Safety: Water quality, water safety, boil water advisories
     - Financial: Tax base, water rates
  3. Where on the rural-urban scale does [municipality] perceive itself?
     - More rural usually means more well water, more septic systems
     - More urban usually means more water utilities

- **Interlocal Agreements in General**

  These questions explain the legal mechanisms of how an agreement proposal is processed by a municipality, or another organization.

  1. Who is the primary author of an ILA, or the primary contact who reviews ILAs, at your organization?
     - Examples: Municipal Council, planners, lawyers, finance department
     - Follow up: Is drafting generally delegated or done by senior staff?
  2. Are these documents collaboratively written or written by one side and proposed to the other?
     - Alternatives: offer and counter-offer, bargaining, etc.
     - What format does a city-to-city discussion about ILAs take?
  3. Are ILAs generally stand-alone or are they connected to larger inter-municipal bargaining?
     - Example: Use of an ILA as a "bargaining chip" for another proposal.
  4. How are ILAs assessed? How is an agreement "approved"?
     - Example: Manifested as a by-law
     - Example: Reviewers might be financial experts, lawyers, planners, etc
  5. Can you define the "lifecycle" of an ILA?
     - How often are new agreements made?
     - How frequently are agreements amended?
     - Are ILAs typically cancelled or renewed?
       - Reviewed and amended?
       - Cancelled/expired and re-written?
       - Cancelled/expired and left unrenewed?

- **Governance**

  These questions consider how agreements are administered, applied, respected, etc. *Governance* can both be "hard" (e.g. laws, regulations, etc) and "soft" (e.g. unwritten agreements, social norms, etc).

  1. When discussing *governance*, Ontario municipal literature tends to identify four key aspects of *good governance*: Public participation, accountability, respect for the rule of

law, and transparency.

Does your organization employ the key aspects *good governance* and can you share some examples of how *good governance* is practiced? Do you think the key aspects of *good governance* meaningfully applied? Or, if these terms do not apply, how does your organization ensure that its participation in or administration of interlocal affairs is of high quality?

- Example 1: In the municipal setting, planning decisions are usually accompanied by public consultation periods, timeframes, reference to various Acts, and publication of information about the decision or development.
- Example 2: In the corporate setting, it's been shown that *leadership capacity* (hours spent on a task) and *competencies* (trained skills) are key to effective corporate governance.

2. What are the most important water-related issues that your organization must address?
    - Examples: Source protection, financial sustainability (cost recovery, funding sources, etc), conservation, access, drinking water safety (boil water advisories, etc), public sentiment, high water use, infrastructural maintenance, etc.
3. Municipalities and other organizations use a wide variety of techniques to apply, maintain, and uphold governance.

    What kind of governance techniques does your organization use? Do those techniques tend towards observation and data collection, direct action by compliance officials, or other techniques?
    - General Examples: Water quality testing and standards, source protection measures, water utility monitoring, water conservation plans, performance indicators, budget "ring-fencing," water supply and demand management plans.
4. Water System infrastructure in the Elgin Area is frequently owned by a public board or commission and operated by an operating authority.

    Does your municipality's Secondary System operate under a similar model? Do you represent an organization that does not follow this structure?
    - Example 1: The Primary Water Systems are owned by their Board and the Ontario Clean Water Association is the Elgin Area operating authority.
    - Example 2: Peterborough uses a utilities commission which retains public ownership of their utilities, but contracts out the operation of those utilities, water services included.
5. In your area, are there major differences between similar types of organizations that are involved in water services? This could be obvious organizational differences (e.g. responsibilities are given to different departments), or behavioural differences (e.g. a municipality that is accommodating to requests vs. a municipality that imposes its preferred outcomes).
    - Example 1: The EAPWSS is board-owned but contracts an operating authority. Peterborough is a municipality that uses publicly owned infrastructure but contracts an operating authority. There are many other models for water services where water infrastructure has been privatized, corporatized, and various hybrid models.

- Example 2: In 2009 the EAPWSS was operated by American Water Canada Corporation, however it is now operated by the Ontario Clean Water Association. Fulfilling the same role, these two organizations likely have many differences in their structure and behaviour.

6. The Primary and Secondary Water Systems have a variety of stakeholders and representatives, such as the Board(s), municipalities (council, departments), corporations, the public, rights holders, among others.
   How are the interests of your organization and others balanced? Is there one stakeholder that is perceived as holding more sway in the decision-making process than others?
   - Example: *Public Consultation* is considered a key aspect of *good governance*. It could be argued that *the public interest* holds more sway than *corporate or economic interests*. It could also be argued court decisions can overrule the expressed wishes of *the public*, and thus does not hold the most sway in the decision-making process.
7. Municipalities, corporations, and other organizations are often portrayed in media and scholarly publications as though they make unanimous decisions. However, most organizations involved in water infrastructure or conservation are large and have many departments or components to their organizational structure.
   How are the interests of different departments, or other organizational structures, within your organization balanced? What maintains unity in the organization's actions?
   - Example: Employee contracts are an effective way to ensure that the employees of a corporation carry out their duty, else they could be reprimanded, penalized, or dismissed.
8. The Elgin Area is serviced by a Primary Water System and many Secondary Water Systems, plus wells and septic systems.
   How would you characterize the relationship between your municipality's Secondary System and the Primary System? What about residents who do not use water systems—how are they represented in discussions about water systems?
9. If neighbouring municipalities are integrating their resources and services, some argue that amalgamating those neighbours is preferable to sharing services. Others argue the opposite.
   Does your municipality or organization have a stance on amalgamation? And are you willing to give your opinion on that stance.
   - Note: This is a complex topic and there might not be a clear statement that encapsulates a municipality's views on the topic. For example, Kitchener and Waterloo have had talks about amalgamating in the past but settled on continuing as independent municipalities that use a highly integrated water system which services both municipalities. There are many reasons beyond water services why municipalities might choose to amalgamate, or conversely why they would prefer to be independent.
10. Do provincial authorities involve themselves in ILAs? The Ontario Land Tribunal and the Local Planning Appeal Tribunal may involve themselves in municipal affairs—but do they? Are the OLT and LPAT ever involved in water agreements that manifest as by-laws? As memoranda of understanding?

- Context 1: The *Municipal Act* gives somewhat broad powers to create ILAs ("agreements") between municipalities and most large institutions, governments, and other bodies.
- Context 2: Some collected data demonstrates the MMAH was interested in the topic, but it is difficult to say whether they involve themselves beyond observation and reporting data.

11. The "electoral character" or "the public opinion" of a municipality is sometimes implied to play a role in what kinds of agreements that municipality will use. As *public participation* is considered important to *good governance*, the electoral character of a municipality at least influences the outcomes of public consultation.
    Are there any examples of local politics or beliefs affecting interlocal water agreements in your municipality?
    - General Examples: Demand for service, denial of providing services to others, etc.
12. Are there any notable public organizations that affect municipal decisions regarding water services, ILAs, by-laws, or other water-related local government activities?
    - Example: Organizations like Ducks Unlimited Canada are involved with wetland conservation which may become intertwined with source water protection.
13. How does the municipality ensure that all participating parties abide by the agreed-upon terms of an ILA? What mechanisms can be used to prevent one stakeholder from taking advantage of another?
    - Example 1: Third-party monitoring or self-reporting on quality metrics can demonstrate how service providers are succeeding or failing to meet their obligations.
    - Example 2: ILAs often have conditions for continuance or cancellation, like fees for early withdrawal from the agreement, conditional approval requirements, timeframes, or other guarantees.
14. The ILAs we've been discussing largely manifest as formal, written, signed documents with more or less rigid legal terms. However, there are other means of collaborating with neighbours that are not formal written documents. Informal agreements are called "soft governance," which typically do not have the same legal enforceability as a "hard" formal agreement.
    Are there any "soft" agreements between municipalities, or other organizations, that you are aware of? Can you describe "soft" governance measures used between municipalities, corporations, etc?
    - Example: A municipality may agree to truck water to a neighbour by request, but no formal agreement ensures tight schedules or guarantees.
15. Part of governance is the delegation of powers and responsibilities. At one point, water infrastructure was a provincial domain, today it has largely been downloaded onto municipalities.
    Broadly, is the distribution of power commensurate to the distribution of responsibilities? Does your organization have adequate authority and legal tools to carry out its mandate? Specifically with regards to water topics, such as infrastructure or conservation.

- Example: Ontario requires that municipal water services be financed by user fees, but it can be challenging in some circumstances to adequately finance the water system through user fees alone.

16. ILAs are inherently about cooperation between separate governments. ILAs often require outsourcing of some services, like an operating authority.
    How do ILAs shape the relationship that your municipality has with its neighbours? How do interlocal politics affect the relationships between corporations and municipal governments?
17. Further from the previous question, how does the interlocal management of water infrastructure affect the municipality's ability to plan for growth, intensification, and development?
    Or, conversely, how does the topic of municipal growth, intensification, and development influence how the municipality manages its interlocal agreements, obligations, relationships, and policy direction?

Recurring Questions

In order to maintain interviewee anonymity, direct quoting from the interview transcript will not be present in the finished project. A short list of recurring questions is presented here as a general provision to the above semi-structured interview. Additionally, as chain-referrals are used as a method, interviewees may be asked about other contacts informed on the subject of interlocal governance.

Q1. Is there supporting documentation available on that subject?
    For example, an Official or Secondary Plan, a By-Law, a (public) memorandum of understanding, a policy, an implementation guideline, or another document?
    a) If yes, do you have a means by which that documentation can be retrieved? Please remember not to share files that are sensitive in nature or subject to document control.

Q2. Is there an additional source, ie. a specific person, I should consider interviewing on that subject?
    a) If yes, please note I am not at liberty to perform additional "cold calling." Would you be comfortable with and willing to forward my contact information to them?
    Note: Only my official University of Guelph email is an acceptable means of communication for the purposes of this research project. I do not have approval to use my personal phone, non-university email, or letter mail address for correspondence related to this project.