Agenda
Lake Huron Primary Water Supply System
Joint Board of Management

The 4th Meeting of the Lake Huron Primary Water Supply System Joint Board of Management
October 8, 2020, 2:00 PM
Virtual Meeting - during the COVID-19 Emergency
City Hall is open to the public, with reduced capacity and physical distancing requirements.

1. Call to Order

2. Adoption of Minutes

   2.1 Minutes of the 3rd Meeting held on Thursday, June 4, 2020

3. Consent Items

   3.1 Kelly Scherr, Chief Administrative Officer - Quarterly Compliance Report
       (2nd Quarter 2020: April - June)

   3.2 Kelly Scherr, Chief Administrative Officer - Environmental Management System and Quality Management System

   3.3 Kelly Scherr, Chief Administrative Officer - Quarterly Operating Financial Status Report - 2nd Quarter 2020

   3.4 Kelly Scherr, Chief Administrative Officer - Capital Status Report

   3.5 Kelly Scherr, Chief Administrative Officer - LH1277 IT Asset Replacement Program

   3.6 Kelly Scherr, Chief Administrative Officer - LH1242 Pressure Transient Monitoring Project

   3.7 Kelly Scherr, Chief Administrative Officer - Port Blake Park

   3.8 Kelly Scherr, Chief Administrative Officer - Waterworks Road

   3.9 Kelly Scherr, Chief Administrative Officer - LH1425 Shoreline Erosion Protection - Tender Award
3.10 Kelly Scherr, Chief Administrative Officer - LH1426 Microbial Inactivation and Storage Environmental Assessment - Contract Award

3.11 Kelly Scherr, Chief Administrative Officer - LH1230 High Lift Pump Replacements - Motor Control Centre and Valve Pre-purchase

3.12 Kelly Scherr, Chief Administrative Officer - Contracted Security Services - Contract Award

3.13 Kelly Scherr, Chief Administrative Officer - LH1260 Coagulation Upgrade - Tender Award

3.14 Kelly Scherr, Chief Administrative Officer - Ailsa Craig Water Storage

3.15 Kelly Scherr, Chief Administrative Officer - LH1429 South Filter Conduit Emergency Repairs

3.16 Kelly Scherr, Chief Administrative Officer - LH1229 Security Upgrades - Tender Award

4. Items for Discussion

4.1 Kelly Scherr, Chief Administrative Officer - 2021 Operating and Capital Budgets (Previously Distributed)

5. Deferred Matters/Additional Business

6. Confidential

6.1 Solicitor-Client Privilege

A matter pertaining to advice that is subject to solicitor-client privilege, including communications necessary for that purpose, with respect to legal liabilities associated with the public access and use of property owned by the Water Supply System.

7. Upcoming Meeting Dates

December 3, 2020

March 4, 2021

June 3, 2021

8. Adjournment
Lake Huron Primary Water Supply System
Report

The 3rd Meeting of the Lake Huron Primary Water Supply System Joint Board of Management
June 4, 2020

Attendance:  Meeting held remotely on Thursday, June 4, 2020, commencing at 2:04 PM.

PRESENT:  C. Burghardt-Jesson (Chair), A. DeViet, J. Fergusson, S. Hillier, S. Lehman, J. Vanderheyden, M. van Holst, P. van Meerbergen, P. Walden, J. Wilcox and B. Willard and J. Bunn (Committee Clerk)

ALSO PRESENT:  R. Aycock (RWS), S. Flanagan (OCWA), D. Gibson, A. Henry, L. Jones (Jacobs Engineering), C. Murchland (OCWA), D. Rodrigues (OCWA), K. Scherr, B. Tully (OCWA), M. Waller (Jacobs Engineering)

1. Call to Order
   1.1 Disclosures of Pecuniary Interest
      That it BE NOTED that no pecuniary interests were disclosed.

2. Adoption of Minutes
   2.1 Minutes of the 2nd Meeting held on Thursday, March 5, 2020
      VAN MEERBERGEN AND FERGUSSON
      That the minutes of the 2nd meeting of the Lake Huron Primary Water Supply System Board of Management, held on March 5, 2020, BE NOTED AND FILED. CARRIED

      Motion Passed

3. Consent Items
   3.1 Quarterly Compliance Report (1st Quarter 2020: January - March)
      VANDERHEYDEN AND VAN HOLST
      That, on the recommendation of the Chief Administrative Officer, the report dated June 4, 2020, with respect to the general, regulatory and
contractual obligations of the Lake Huron Primary Water Supply System, for January to March 2020, **BE RECEIVED. CARRIED**

3.2 Environmental Management System and Quality Management System
VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the report dated June 4, 2020, with respect to the Environmental Management System and Quality Management System for the Lake Huron Primary Water Supply System, **BE RECEIVED. CARRIED**

3.3 Quarterly Operating Financial Status Report - 1st Quarter 2020
VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the report dated June 4, 2020, with respect to the Quarterly Operating Financial Status of the Lake Huron Water Supply System, **BE RECEIVED. CARRIED**

3.4 2019 Audit Financial Statement
VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the 2019 Audited Financial Statement for the Lake Huron Primary Water Supply System, as appended to the report dated June 4, 2020, **BE RECEIVED AND ACCEPTED. CARRIED**
3.5 Water System Operation - Contract Status Update

VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the report dated June 4, 2020, with respect to the status of the contract with the Ontario Clean Water Agency as the contracted operating authority for the Lake Huron Primary Water Supply System Board of Management, BE RECEIVED. CARRIED

Motion Passed

3.6 COVID-19 Pandemic

VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the report dated June 4, 2020, with respect to the COVID-19 Pandemic and related impacts to the Lake Huron Primary Water Supply System, BE RECEIVED. CARRIED

Motion Passed

3.7 2021 and 2022 Meeting Schedule

VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the proposed meeting schedule for the Board of Management for 2021 and 2022, as included in the report dated June 4, 2020, BE APPROVED. CARRIED

Motion Passed

3.8 LH1317 Distressed Pipe Replacement Project

VANDERHEYDEN AND VAN HOLST
That, on the recommendation of the Chief Administrative Officer, the report dated June 4, 2020, with respect to the LH1317 Distressed Pipe Replacement Project, BE RECEIVED. CARRIED
4. Items for Discussion

4.1 Master Water Plan Update

LEHMAN AND HILLER

That, on the recommendation of the Chief Administrative Officer, the following actions be taken with respect to the report dated June 4, 2020 related to the Lake Huron Primary Water Supply System Master Water Plan Update:

a) the above-noted 2019 Master Water Plan Update BE ENDORSED; and,

b) the creation of a capital project to initiate a Microbial Inactivation and Storage Schedule B Environmental Assessment BE AUTHORIZED with an approved budget of $500,000; it being noted that the Capital Reserve Fund will be utilized for the source of funding. CARRIED

Motion Passed

5. Deferred Matters/Additional Business

None.

6. Next Meeting Date

October 8, 2020

7. Adjournment

The meeting adjourned at 2:47 PM.
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject: Quarterly Compliance Report (2nd Quarter 2020: April - June)  

RECOMMENDATION  
That the Quarterly Compliance report with respect to the general, regulatory and contractual obligations of the Lake Huron Primary Water Supply System BE RECEIVED for the information of the Board of Management; it being noted that there were no Adverse Water Quality Incidents reported in the 2nd quarter of 2020.  

EXECUTIVE SUMMARY  
Since the previous report to the Board, there are no new regulatory changes that may significantly impact the Lake Huron Primary Water Supply System (LHPWSS).  


There were no Adverse Water Quality Incidents (AWQI) reported by the operating authority or the third-party accredited laboratory during this quarter.  

BACKGROUND  
Pursuant to Board of Management resolution, this Compliance Report is prepared on a quarterly basis to report on general, regulatory and contractual compliance issues relating to the regional water system. For clarity, the content of this report is presented in two basic areas, namely regulatory and contractual, and does not intend to portray an order of importance or sensitivity nor a complete list of all applicable regulatory and contractual obligations.  

REGULATORY ISSUES  
Recent Regulatory Changes: At the time of drafting this report, there were no new regulatory changes for this reporting period which may significantly impact the LHPWSS.  

New Environmental Registry of Ontario (ERO) Postings: At the time of drafting this report, there were no new postings on the ERO that may have a significant impact on the LHPWSS.

Note: In order to better comply with the Accessibility for Ontarians with Disabilities Act, 2005, the detailed tables of water quality test results which were previously appended to this Report have been removed. The full list of test results of drinking water quality parameters is posted on the water system’s website and available in print at the Board’s Administration Office in London upon request. In addition, the detailed water quality information is also published within the water system’s Annual Report required by O.Reg. 170/03 under the Safe Drinking Water Act.

Adverse Water Quality Incidents (AWQIs): There were no AWQI reported by the operating authority or adverse laboratory results reported by the third-party accredited laboratory during this quarter.

Compliance Inspections: There were no compliance inspections conducted during this reporting period.

**CONTRACTUAL ISSUES**

**ARTICLE 3, “Operation and Maintenance of the Facilities – General”:**
Board staff informally meets with OCWA on a monthly basis to discuss operations and maintenance related issues, and formally on a quarterly basis to review contractual performance. The 2020 second quarter Contract Report was received from OCWA on July 30, 2020 and was discussed at the quarterly administration meeting between Board staff and OCWA on August 13, 2020. Copies of the monthly Operations and Maintenance Reports, or quarterly Contract Reports are available at the Board’s Administration Office in London upon request.

This report was written by Erin McLeod, Quality Assurance and Compliance Manager.
**Recommendation**

That the following report with respect to the Environmental Management System and Quality Management System for the Lake Huron Primary Water Supply System BE RECEIVED for information.

**Background**

**Environmental Management System (EMS)**

The Lake Huron Primary Water Supply System (LHPWSS) has an Environmental Management System (EMS) which has been registered to the ISO 14001 standard since 2003. The LHPWSS underwent a three-year registration audit in November 2017 and was recommended for registration to the ISO14001:2015 standard for a three-year period (ending in 2020).

The continued utilization and registration of the EMS to the ISO 14001 standard is a requirement of the Service Agreement with Ontario Clean Water Agency (OCWA), the contracted Operating Authority for the LHPWSS.

**Quality Management System (QMS)**

In 2006, the Drinking Water Quality Management Standard (DWQMS) was integrated with the existing EMS and the combined EMS/QMS is maintained by the contracted Operating Authority. The Safe Drinking Water Act (SDWA) and the water system’s Municipal Drinking Water License (MDWL) require that an accredited Operating Authority be in operational charge of the drinking water system. In order to become accredited, the Operating Authority must utilize and maintain an Operational Plan that meets the requirements of the DWQMS and must undergo an external accreditation audit every three years.

OCWA received full scope DWQMS re-accreditation in November 2019 and is currently accredited for the three-year period ending in 2022.
DISCUSSION

Management Review
The documented EMS/QMS and its performance requires Management Review by Top Management a minimum of once every calendar year to ensure that the management team of the Board and the Operating Authority stay informed of environmental and quality related issues. Items discussed at the Management Review meetings include, but are not limited to, water quality test results, environmental and quality performance, legislative changes, identified non-conformances, corrective and preventive actions, staff suggestions, changing circumstances and business strategies, and resource requirements. Corrective and preventive actions include not only those to address non-conformance issues and opportunities for improvement identified as part of internal and external audits, but also non-compliance issues identified by the Ministry of the Environment, Conservation and Parks (MECP), suggestions from staff, and opportunities for improvement identified during the Management Review process.

In order to carry out more effective Management Review meetings, the Board’s administration has opted to conduct shorter meetings at more frequent intervals. Although each required Management Review input may not be covered at every meeting, over the course of the year all required inputs are reviewed at least once. Management Review meetings are held in a combined format for both the LHPWSS and the Elgin Area Primary Water Supply System (EAPWSS).

A Management Review meeting was held on June 22, 2020. The meeting minutes are attached to this report as Appendix A for the information of the Board.

Internal Audits
Pursuant to the international ISO 14001 EMS standard and the provincial DWQMS standard, periodic “internal” audits are performed by the Board’s administration to ensure continued compliance with legislated, contractual, and other requirements, as well as conformance with the ISO 14001 EMS standard and DWQMS standard. Internal audits also ensure that the ongoing operation of the LHPWSS conforms to the EMS and QMS as implemented. As required by the standards, internal audits are performed a minimum of once every calendar year.

A combined EMS/QMS Internal Audit was conducted on August 5 & 6, 2020 and a summary of the audit findings is included in Appendix B of this report (full report available on request). One (1) non-conformance and three (3) opportunities for improvement were identified during the audit. The audit findings were discussed at the September 1, 2020 Management Review meeting and action items were subsequently assigned.

External Audits
Annual surveillance audits (third-party external audits) are conducted for both the EMS and QMS, with a recertification audit taking place every third year. The external registrar for both
the EMS and QMS is currently SAI Global. External audits review all aspects of the EMS or QMS, including the internal audits, subsequent management reviews, and corrective action processes.

There were no external audits conducted during this reporting period. The annual external audits have been scheduled for September 21, 2020 (QMS) and October 14-16, 2020 (EMS) and the results will be included in a future report to the Board.

**Corrective and Preventive Actions**
For an EMS and QMS to be effective on an on-going basis, an organization must have a systematic method for identifying actual and potential non-conformities, making corrections and taking corrective and preventive actions, preferably preventing problems before they occur. The Internal Audit process and Management Review are the two main drivers for identifying potential problems and opportunities for improvement for the LHPWSS and implementing corrective actions. Preventive actions may originate from identified opportunities for improvement as part of an audit, but also staff suggestions and discussions with management.

It is important to note that action items should not be construed as **compliance failures**, but rather an action to be undertaken which will improve the LHPWSS’s overall performance.

Action items are the result of the “PLAN-DO-CHECK-ACT” continual improvement process. The identification of action items is a critical component of continual improvement and an essential element of management systems. The identification of action items should be seen as a positive element, as this drives continual improvement.

A key concept of PLAN-DO-CHECK-ACT is that it does not require nor expect 100% conformance but promotes an environment of continual improvement by identifying shortfalls, implementing corrective and preventive measures, and setting objectives and targets for improvement. Figure 1 outlines the general process.
Since the last report to the Board, the following summarizes new action items that have been added to the EMS/QMS action item tracking system:

- Six (6) new proactive action items were added as a result of the June 22, 2020 Management Review Meeting’s COVID-19 Emergency Response Interim Debrief
- Four (4) new action items were added as a result of the August 5-6, 2020 Combined EMS/QMS Internal Audit.

As of September 1, 2020, there are currently 14 open action items in the system. Action items are prioritized and addressed using a risk-based approach, and deadlines established given reasonable timeframes and resources that are available. Board staff are pleased with the performance of the corrective and preventive action process and have no concerns with the number of open action items.

Figure 1: Plan-Do-Check-Act improvement process
The Internal Audits and frequent Management Review meetings continue to effectively identify system deficiencies. The EMS and QMS for the LHPWSS continue to be suitable, adequate and effective. Activities by OCWA continue to address the need for change, and the management systems are being revised and refined as required.

This report was prepared by Erin McLeod, Quality Assurance & Compliance Manager with the assistance of Christine Jansen, Compliance Coordinator.

Submitted by:
Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by:
Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer

Attachments:

Appendix A – Management Review Meeting Minutes (June 22, 2020)
Appendix B – EMS/QMS Internal Audit Report Summary (August 5 & 6, 2020)
APPENDIX A: MANAGEMENT REVIEW MEETING MINUTES (JUNE 22, 2020)

Lake Huron & Elgin Area Primary Water Supply Systems EMS/QMS Management Review

<table>
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<tr>
<th>Date</th>
<th>June 22, 2020</th>
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</thead>
<tbody>
<tr>
<td>Time</td>
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<tr>
<td>Location</td>
<td>Virtual – Microsoft Teams</td>
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<tr>
<td>Attendees</td>
<td>Andrew Henry (RWS), Erin McLeod (RWS), Christine Jansen (RWS), Blair Tully (OCWA), Denny Rodrigues (OCWA), Simon Flanagan (OCWA), Greg Henderson (OCWA)</td>
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<tr>
<td>Regrets</td>
<td>Randy Lieber (OCWA)</td>
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<td>C.C.</td>
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N.B.: Management Review meetings are held in a combined format for both the Lake Huron Primary Water Supply System (LHPWSS) and the Elgin Area Primary Water Supply System (EAPWSS).

-----Meeting Notes-----

1. Review and approval of previous meeting minutes – April 20, 2020

   Revision 1 of the minutes are posted to SharePoint. Minutes were reviewed and approved.

2. Notes from Board Meetings

   Elgin Board Meeting (June 4, 2020)
   Quarterly Compliance Report: The report was received for information. EMS/QMS Report: The report was received for information.

   Huron Board Meeting (June 4, 2020)
   Quarterly Compliance Report: The report was received for information. EMS/QMS Report: The report was received for information.
3. Environmental and Quality Policies

   a) EAPWSS policy
      • Last revised in 2018
      • No changes recommended
      • No issues with policy was found during external audits
      • There will be no impacts to this policy due to the upcoming EMPS ownership clarifications

   b) LHPWSS policy
      • Last revised in 2018
      • No changes recommended
      • No issues with policy was found during external audits

4. Monitoring and Measurement Results – 2018 Energy Reporting

   a) EAPWSS
      • In 2018, flow, electricity, natural gas and GHG emission was up from previous years but energy intensity was down (due to higher flow).
      • There will be a reduction in energy intensity in 2019 related to the removal of A-Pipeline from service
      • Should also see a further reduction in electricity usage with new HL pumps installed in 2020.
      • Should look at improving natural gas usages in the future (EMS objectives and targets are currently focused on improvements to electricity and chemical usage only)

   b) LHPWSS
      • In 2018, flow, natural gas and GHG emission was up from previous years but electricity and energy intensity were down (due to higher flow & operational control measures).
      • OCWA noted that in 2020, natural gas at the Huron WTP appears to be down from the previous year. OCWA has been making setpoint changes. Note that natural gas is used year-round at this plant for humidity control.
      • Should see a further reduction in electricity usage in future with new HL pumps scheduled to be installed in 2021.
      • Should look at improving natural gas usages in the future (EMS objectives and targets are currently focused on improvements to electricity and chemical usage only)

5. Incidents of Adverse Drinking Water Tests

   EAPWSS & LHPWSS
• No incidents of adverse drinking water quality since August 2019

6. QMS Operational Plan Currency, Content and Updates

OCWA recently reviewed the administrative procedures and forms in SharePoint and they are up to date. Management of change process is effective and helps ensure currency of EMS/QMS documentation. Management of change process has slowed down since COVID-19, but will be getting back on track.

a) EAPWSS
• Need to update QMS Operational plan to include 2019 incoming raw water characteristics
• Management of change process is needed for the sodium bisulphite (SBS) Tank Installation project
• Will need to start management of change process for Alum Tank Replacement project

b) LHPWSS
• Need to update QMS Operational plan to include 2019 incoming raw water characteristics
• Will need to start management of change process for four projects: Huron chamber rehabilitation work, Huron Beach Chamber upgrades project, High Lift Pump Replacements and Huron Coagulation Upgrades.

7. Effectiveness of Risk Assessment Process

• There will be an annual risk assessment process review taking place this summer.
• The risk assessment is also updated throughout the year if there are any changes (as needed).
• High water levels in Lake Huron and Lake Erie should be considered as a risk during the next review. High water levels are currently impacting the Huron beach chamber.
• The MECP has dropped a number of their research sampling programs, which should be considered in the assessment. However the microcystin sampling program is now embedded in MDWL requirements.
• “Pandemic” and critical staff shortage is listed under the mandatory risk assessment requirements by the MECP but it is very generic – more detail needed due to current situation (COVID-19 pandemic) o POST MEETING NOTE: after further investigation, the MECP Risk Assessment document does not include “pandemic” as a mandatory item, however it will still be considered during the upcoming risk assessment review process
8. Consumer Feedback

- No consumer feedback or complaints to date for 2020
- OCWA Client updates – more information has been communicated to clients recently during the pandemic which may be why there is a lack of feedback/inquiries

9. Status of Action Items from Previous Management Review

EAPWSS & LHPWSS

- Handouts were provided which contained a summary of all open action items
- Staff are to further review the summary to note any open actions items assigned to them
- Several items have been closed out in recent weeks but some overdue items are still open

10. Status of Management Actions Items Identified Between Reviews

a) EAPWSS

- Corrective Action Form (CAF) – Elgin CO2 Release (Nov. 28, 2019)
  - internal form filled out by OCWA
- CAF – Elgin MECP Inspection Report (March 17, 2020)
  - internal form filled out by OCWA
- CAF – Elgin RMF total chlorine residual (TCR) Exceedance (May 6, 2020)
  - internal form filled out by OCWA

  For each of the CAF items noted above, any action items identified will be added to the tracking spreadsheet to ensure completion.

b) LHPWSS

- no CAFs for LHPWSS

11. Overall Decision on the Suitability, Adequacy and Effectiveness of the EMS & QMS

A discussion took place on the management systems as a whole, reflecting back over the past year. Top management confirmed that the management systems continue to be suitable, adequate and effective. The following observations support this conclusion.

Audit results: There were no non-conformances during the last external audits.
MECP Inspection result: The annual MECP Inspection ratings dropped from the previous year. In 2019/20 the EAPWSS inspection rating was 97.11% and the LHPWSS inspection rating was 93.25%, down from 100% the previous year.

Action Items: Continue to be addressed in a timely fashion. Action item completion status is very good overall and continues to be the best it has ever been. EAPWSS currently has only 10 open action items, and LHPWSS 14 action items.

Objectives and targets: Overall the trends continue to improve for the EMS objectives and targets related to electricity and chemical consumption.

System uptime/downtime: There have been no major upsets in the past year that have impacted our ability to supply customers. There was one extra shutdown during the recent Huron pipeline repair which was due to a valve not holding.

Operations have been managed well over the past year during major projects (added risk).

Overall the Board and municipal staff (ie. customers) seem to be satisfied with management system results.

Legal status of Board: depending on the outcome, this could present opportunities to streamline policies etc.

Resources: working remotely; web-based meetings; alternate means of communications which we have all adopted; options to have audits remotely; flexibility during COVID-19.

Incremental continual improvement.

Water quality: No AWQIs and meeting all contractual performance criteria.

12. Results of Emergency Response Testing

a) London to EAPWSS Backfeed Test (Jan. 2020)
   • Able to backfeed and provide flow from City of London distribution system into the EMPS reservoir – test was a success
   • Adequate to maintain supply
   • Backfeed into the reservoirs as opposed to directly into the transmission mains is preferable, however several different scenarios are possible depending on level of emergency
   • OCWA completed a Contingency Plan Review/Test Form to document the test.
b) COVID-19 Pandemic

- See COVID-19 Interim Debrief Summary for detailed information on the response to the COVID-19 pandemic
- Critical shortage of staff emergency response testing is being performed at the Elgin and Huron WTPs.
- A thorough outline of the response of OCWA and RWS to the current pandemic is essential. It is likely to be a non-conformance if one is not available during a future audit. The Interim Debrief Summary addresses this.

c) Annual Fire Drills were completed at both the Elgin WTP and Huron WTP

**Next Meeting:** To Be Determined
APPENDIX B: EMS/QMS INTERNAL AUDIT REPORT SUMMARY (AUGUST 5-6, 2020)

2.0 AUDIT FINDINGS

2.1 POSITIVE FINDINGS

The following positive audit findings were noted during the audit:

Commitment
- staff interviewed were knowledgeable about their processes and programs and their roles’ impacts on achieving the commitments included in the QEMS Policy.
- all staff interviewed felt they had the support from the Owner and management, their colleagues (in a collaborative team approach), and the resources they needed to carry-out their jobs well.
- competency requirements are closely monitored and consistently met for personnel directly affecting drinking water quality. The OA consistently exceeds the minimum training hours for certifications.
- Stakeholders communicate their satisfaction of the products and services provided by RWS and OCWA.

Culture of improvement
- consistently throughout the audit, improvements were noted with regards to achieving intended outcomes of drinking water system processes and programs (e.g. “pandemic” consideration in latest QMS risk assessment & outcomes; creation of HMC-8 Critical Shortage of Staff contingency plan).
- system optimization, effectiveness and efficiency are regularly evaluated by integrating financial, operational plans, capital plans with all other initiatives and implementing a business case approach.
- all opportunities for improvement presented through the last internal and external audits have been confirmed completed or are in progress.

Risk-based thinking
- risk-based thinking is evident among staff (consistently referencing reliability and redundancy of systems and equipment); with a focus on preventing, minimizing, and responding to system risks (e.g. items related to CCP’s and SEA’s: implementation of LED lighting, acoustic fibre optic technology to help monitor transmission mains’ conditions, establishing a proactive instrument replacement program, labelling valves “normally open” and “normally closed”, creating training videos, etc.).
- the Management of Change checklist captures an evaluation of the effects of changes to the
LHPWSS that may require updates to the EMS / QMS related to: equipment, processes, chemicals, capital projects, risks and opportunities, business environment and organizational changes.

Use of technology
- New technology is being deployed (e.g. work order software program, planning to use Office 365 to improve capital / asset / operational tracking and prioritization processes) to electronically record operational, maintenance, and compliance information, optimizing staff resources.

2.2 NON-CONFORMITIES
The following non-conformity was noted during the audit:

Control of documented information

DWQMS Element 5 PLAN a) i., ii. and ISO 14001:2015 s.7.5.2c), s. 7.5.3a) require that documented information required by the QEMS is kept current / suitable and available where it is needed.

- Noted instances of documented information that was not the current version where it was needed. For example:
  - LF-ADMIN-2050 Weekly Sample Plan (in lab area) – v.4.0 (should be v.6.0)
  - LF-ADMIN-2052 Acceptable Sample Results (in lab area) – v.2.0 (should be v.3.0)

2.3 OPPORTUNITIES FOR IMPROVEMENT
The following is a list of opportunities for improvement noted in conducting this audit:

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<thead>
<tr>
<th>Reference</th>
<th>Opportunity for Improvement – Description</th>
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<tr>
<td>Electronic records retention</td>
<td>Consider describing “disposal” of electronic documented information (as referenced in s. 5.21 and 5.22 of LH-ADMIN-200). [This would support DWQMS Element 5 PLAN a) iii. and ISO 14001:2015 s.7.5.3]. Comment at closing meeting (2020-08-06): RWS is planning to develop retention policies for implementation in SharePoint in 2021.</td>
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| Roles / responsibilities re: communications with the public | Consider defining Regional Water Supply’s role in public communication, outreach and education (to encourage a cohesive and consistent single voice) among all communities served by the drinking water system. [This would support DWQMS El. 9 PLAN b), El. 12 PLAN d); and ISO 14001:2015 s.7.4.1].  
*Comment at closing meeting (2020-08-06):* This is effectively laid out for emergency response / crisis communications; the OFI relates to general day- to-day program communications. |
| --- | --- |
| Effectiveness of continual improvement | As part of the “90-day check comments” column in the CAF Tracking spreadsheet, consider describing how “effectiveness” of actions taken to address issues is confirmed. [This would support DWQMS El. 21 PLAN b) iii. and c) iii. and ISO 14001:2015 s.10.2d)].  
*Comment at closing meeting (2020-08-06):* Quarterly prompts exist for action items’ status updates prior board meetings (at a minimum). Confirmation of “effectiveness” of action items would help confirm that root causes of issues are correctly identified, effectively implemented and addressed. |
3.0 CONCLUSIONS

The results of the internal audit performed at the Lake Huron Water Treatment Plant, Arva Reservoir and Komoka-Mt. Brydges Pumping Station, McGillivray Booster Pumping Station, and Exeter-Hensall Pumping Station & Reservoir for the Lake Huron Primary Water Supply System confirm that the quality and environmental management systems established are effective in conforming with the requirements of the Drinking Water Quality Management Standard (DWQMS 2.0) and ISO 14001:2015 Environmental management systems.

While a non-conformity and opportunities for improvement are cited in this audit report, they do not undermine the positive programs and attitudes already in place among Lake Huron & Elgin Area Primary Water Supply Systems and Ontario Clean Water Agency staff.
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Subject: Quarterly Operating Financial Status Report – 2nd Quarter 2020

RECOMMENDATION

That this report regarding the Quarterly Operating Financial Status of the Lake Huron Water Supply System BE RECEIVED by the Board of Management for information.

BACKGROUND

At the request of the Board of Management, a Financial Status Report is provided on a quarterly basis for information. The financial status provides a high-level overview of incurred expenditures and revenues on a cash-flow basis and is compared to the approved operating budget of the water supply system. All expenditures and revenues provided in this Financial Status Report are unaudited and may include accrued and/or unaccrued expenses of a previous or future fiscal year.

A high-level summary of incurred expenses and revenues for the water supply system is attached to this report as Appendix A for the second quarter 2020 (April 1 to June 30) as well as a comparative accumulation from January 1 to June 30 (Year to date).

The reported expenditures and revenues may be subject to adjustments prior to year-end and the creation of the audited financial statements.

DISCUSSION

For the information and reference of the Board, the following highlights of the attached summary provides a brief explanation of notable deviations from the approved budget and/or clarifications of the financial summary:

- **Contracted Operating Services** in the summary report reflects the total direct operating costs of the contracted operation of the water treatment and transmission system, as well as related contracted services (example: AFO monitoring). The total accumulated operating costs over the year (unaudited) is higher than the same period in 2019 and is reflective of contractual increases in service agreements with the operating authority and other contracted services.

- **Contracted Administrative Services** in the summary report reflects the fees paid to the City of London.
Electricity expenditures include the purchase of energy as well as energy management services for the water system. The water system is currently tracking approximately $230,000 lower than the same period of last year largely due to lower volumes supplied in March and April of this year.

Salaries, wages and benefits expenditures include all direct labour costs for administrative staff including benefits. Variations over the same period in 2019 are attributed to annual salary adjustments, staff vacancies, and marginally lower total staffing costs as a result of the pandemic.

Administration and Other Expenses relates to various overhead operating expenses, including subscriptions and memberships, office supplies and property taxes. While the reported expenditures will be adjusted as part of the year-end process, accounting for 2021 pre-payments and other cost accounting adjustments, the costs to date are tracking lower than the same period in 2019 due to cost reductions implemented as a result the pandemic.

Vehicles and Equipment expenditures include costs associated with vehicles, computers and office equipment for administrative staff.

Purchased Services and Professional Fees largely relates to allowances for ad hoc professional consulting and legal services, office lease, telephone charges, network and SCADA maintenance, printing services, and pipeline locate costs.

Debt Principle and Interest payments occur twice per year; in the first and third quarter.

Contributions to the Reserve Funds occur at the end of the fiscal year as part of the year-end audit preparation process, where the actual contributions are the total remaining revenue in excess of expenditures. Accordingly, the exact amount of the anticipated contribution is currently not posted but should be in the order of $8.6 million between the three dedicated Reserves.
## Quaterly Financial Summary Report

Lake Huron Water Supply System  
2nd Quarter 2020 (April 1 2020 to June 30 2020)  
($,000's)

<table>
<thead>
<tr>
<th></th>
<th>Approved 2020 Budget</th>
<th>Q2-2020</th>
<th>2020 Year to Date</th>
<th>Year To Date Variance</th>
<th>2019 Year To Date</th>
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<td>5,361</td>
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<tr>
<td>Contracted Operating Services</td>
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<td>158</td>
<td>550</td>
<td>321</td>
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<td>Administration and Other Expenditures</td>
<td>363</td>
<td>134</td>
<td>248</td>
<td>115</td>
<td>262</td>
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<td>Vehicles and Equipment</td>
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<td>5</td>
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<td>24</td>
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<tr>
<td>Purchased Services &amp; Professional Fees</td>
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<td>64</td>
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<td>410</td>
<td>250</td>
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<td>Debt Principle Payments</td>
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<td>898</td>
<td>350</td>
<td>886</td>
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<td>Interest on Long-Term Debt</td>
<td>168</td>
<td>3</td>
<td>81</td>
<td>87</td>
<td>103</td>
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<td>Contributions to Reserve Funds</td>
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<td>0</td>
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<tr>
<td><strong>Total Expenditures</strong></td>
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<td>2,676</td>
<td>6,259</td>
<td>16,539</td>
<td>6,046</td>
</tr>
</tbody>
</table>
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Subject: Capital Status Report

RECOMMENDATION

That the following actions be taken with regard to Lake Huron Primary Water Supply System capital projects:

a) That this report regarding the status of capital projects BE RECEIVED for information; and,

b) That projects LH2019-19 Master Water Plan, LH1341 Sodium Hydroxide Metering Pump, and LH1382 Annual IT Mtce. Allowance BE CLOSED, with the surplus funds in the approximate amount of $62,213 be released to the Board's Reserve Funds; and,

c) That projects LH3161-19 Annual Maintenance (2019) BE CLOSED, with additional funds in the approximate amount of $85,553 be drawn from the Asset Replacement Reserve Fund.

DISCUSSION

The Capital Project Status Report, attached to this report as Appendix A for the Board's information, provides a brief overview of the status of current capital projects for the Lake Huron Primary Water Supply System. This report is provided for the general information of the Board.

The status report is divided into four categories of projects, namely:

1. **Ongoing Projects**: This section provides a summary list of all projects which are funded by the Board through the Capital Budget and which are currently in-progress. Board funded projects are typically for the replacement or upgrade of existing assets, the construction of new assets, or engineering studies and assessments, as approved by the Board.
Under the terms of the Service Agreement with the contracted operating authority, the Board is also required to pay for some maintenance/repair projects. The benchmark used in the operating contract is that if the value of the material and any contracted labour is over $30,000, the project is considered Capital Maintenance and the contracted operating authority would fund the first $30,000, with the balance funded by the Board. Accordingly, the Board maintains an annual “fund” within the Board’s capital budget to pay for these projects as they arise.

2. Completed Projects - Release Surplus to Reserve Funds: This section provides a summary list of all projects which are presently completed, but do not require additional funds from that budgeted. Should the Board approve the closure of the listed projects, it is the recommendation of staff to release the surplus funds, if any, to the Reserve Fund.

Completed Projects – Reduce Authorized Debt: In the case where the project is funded through the issuance of a debenture, should the Board approve the closure of the listed project it is the recommendation of staff to reduce the previously authorized but unissued debt for the project(s).

3. Completed Projects - Additional Funding Required: This section provides a summary list of all projects which are presently completed, but require additional funds from that originally approved. Should the Board approve the closure of the listed projects, it is the recommendation of staff to provide the required additional funding from the Board’s Reserve Fund.

Submitted by:  
Andrew Henry, P. Eng.  
Director, Regional Water Supply

Recommended by:  
Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Attachments: Capital Project Status Summary
### APPENDIX A: CAPITAL PROJECT STATUS SUMMARY

#### A.1 Ongoing Capital Projects

<table>
<thead>
<tr>
<th>PROJECT NO.</th>
<th>PROJECT</th>
<th>APPROVED BUDGET</th>
<th>EXPENDED TO DATE *</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH1016</td>
<td>Huron Safety Railing Replacement</td>
<td>$175,000</td>
<td>$26,919</td>
<td>Project ongoing</td>
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<td>LH1021</td>
<td>Huron Low Lift Pump 6 Refurbishment</td>
<td>$40,000</td>
<td>$0</td>
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<td>LH1025</td>
<td>Bluewater Hwy Property Purchase</td>
<td>$600,000</td>
<td>$546,122</td>
<td>Property purchased. Demolition by 2021</td>
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<tr>
<td>LH1105</td>
<td>Computerized Maintenance Management System</td>
<td>$180,000</td>
<td>$44,755</td>
<td>Project ongoing</td>
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<tr>
<td>LH1207</td>
<td>Concrete Crack Injection</td>
<td>$120,000</td>
<td>$74,426</td>
<td>Ongoing multi-year project</td>
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<tr>
<td>LH1209</td>
<td>HLP#5 Valve Replacement</td>
<td>$365,000</td>
<td>$149,148</td>
<td>Project ongoing</td>
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<tr>
<td>LH1216</td>
<td>Closed Loop Chlorine Control</td>
<td>$100,000</td>
<td>$10,914</td>
<td>Project on hold pending LH1230 completion</td>
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<tr>
<td>LH1219</td>
<td>Filter Backwash Turbidity Meters</td>
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<td>$135,440</td>
<td>Project ongoing</td>
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<tr>
<td>LH1227</td>
<td>Pipe Conveyance System</td>
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<tr>
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<td>Security Upgrades</td>
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<td>$151,232</td>
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<td>LH1230</td>
<td>High Lift Pump Replacement</td>
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<td>LH1232</td>
<td>Arva Victaulic Repair</td>
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<tr>
<td>LH1233</td>
<td>Control Panel/Wire Cleanup</td>
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<td>Project complete. Awaiting final invoice</td>
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<td>LH1239</td>
<td>Sluice Gate Repairs</td>
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<tr>
<td>LH1242</td>
<td>Hydraulic/Transient Model Update and Monitoring</td>
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<td>$100,167</td>
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<td>LH1244</td>
<td>Building Exterior Condition Assessment</td>
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<td>$73,401</td>
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<td>LH1255</td>
<td>Crop Yield Monitoring – 2012 Rupture</td>
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<td>$41,561</td>
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<td>LH1257</td>
<td>Chamber 63 Access Culvert</td>
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<td>$39,465</td>
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<td>PROJECT NO.</td>
<td>PROJECT</td>
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<td>STATUS</td>
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<tr>
<td>LH1258</td>
<td>McGillivray Control Panel Replacement</td>
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<td>LH1260</td>
<td>Flash Mixer Upgrade</td>
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<td>LH1261</td>
<td>PLC Replacements</td>
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<td>LH1262</td>
<td>WTP UPS Replacement</td>
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<td>LH1263</td>
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<td>LH1264</td>
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<td>LH1265</td>
<td>RMF Settling Tank Repairs</td>
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<tr>
<td>LH1266</td>
<td>Huron Plant UV Disinfection</td>
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<td>LH1267</td>
<td>Plant Interior Door Replacement</td>
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<td>LH1268</td>
<td>Obsolete Equipment Removal</td>
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<td>$6,292</td>
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<td>LH1269</td>
<td>Settled Water TSS Analyzer</td>
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<td>LH1270</td>
<td>Interior LED Lighting Upgrades</td>
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<td>LH1271</td>
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<td>LH1272</td>
<td>Service Water Pipe Replacement</td>
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<td>LH1273</td>
<td>(PS3) Exeter-Hensall Pump Control Upgrades</td>
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<td>LH1274</td>
<td>SCADA Control Modifications</td>
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<td>$0</td>
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<td>LH1275</td>
<td>Sewage Ejector Replacement</td>
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<td>LH1276</td>
<td>Backwash Check Valve Replacement</td>
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<td>$39,666</td>
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<td>LH1277</td>
<td>IT Asset Replacement Program</td>
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<td>LH1278</td>
<td>Safety Showers Upgrade</td>
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<td>LH1279</td>
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<td>Easement Maintenance</td>
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<td>Strathroy Transmission Main</td>
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<td>$14,838,658</td>
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<td>Annual program</td>
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<td>LH1347</td>
<td>Pipeline Chamber Upgrades</td>
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<td>WTP Modifications</td>
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<td>Filter Media Rebuild</td>
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<td>LH1373</td>
<td>IT Upgrades</td>
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<td>LH1380</td>
<td>Clarifier Upgrades</td>
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<td>$5,031</td>
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<td>LH1385</td>
<td>1996 Crop Yield Monitoring</td>
<td>$450,000</td>
<td>$312,984</td>
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<td>LH1386</td>
<td>Chemical Delivery Panel</td>
<td>$75,000</td>
<td>$80,789</td>
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<td>LH1388</td>
<td>Coagulation Optimization Study</td>
<td>$50,000</td>
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<td>LH1425</td>
<td>Huron Erosion Control</td>
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<td>$112,089</td>
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<tr>
<td>LH1426</td>
<td>Microbial Inactivation and Storage EA</td>
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<td>LH1900</td>
<td>Record Drawings &amp; Documents</td>
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<td>$404,207</td>
<td>Ongoing multi-year project</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$50,473,000</strong></td>
<td><strong>$24,829,486</strong></td>
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</tbody>
</table>
### A.2(a) Completed Projects – Release Surplus to Reserve Funds ($62,213)

<table>
<thead>
<tr>
<th>PROJECT NO.</th>
<th>PROJECT</th>
<th>APPROVED BUDGET</th>
<th>EXPENDED TO DATE *</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH2019-19</td>
<td>Master Water Plan</td>
<td>$135,000</td>
<td>$75,037</td>
<td>Project completed</td>
</tr>
<tr>
<td>LH1341</td>
<td>Sodium Hydroxide Metering Pump</td>
<td>$75,000</td>
<td>$74,990</td>
<td>Project completed</td>
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<td>LH1382</td>
<td>Annual IT Mtce. Allowance</td>
<td>$200,000</td>
<td>$197,760</td>
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<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>$410,000</strong></td>
<td><strong>$347,787</strong></td>
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</table>

* Expended as of 04 September 2020

### A.2(b) Completed Projects – Reduce Authorized Debt

<table>
<thead>
<tr>
<th>PROJECT NO.</th>
<th>PROJECT</th>
<th>APPROVED BUDGET</th>
<th>EXPENDED TO DATE *</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>$0</strong></td>
<td><strong>$0</strong></td>
<td></td>
</tr>
</tbody>
</table>

### A.3 Completed Projects – Additional Funding Required ($85,553)

<table>
<thead>
<tr>
<th>PROJECT NO.</th>
<th>PROJECT</th>
<th>APPROVED BUDGET</th>
<th>EXPENDED TO DATE *</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LH1316-19</td>
<td>Annual Maintenance (2019)</td>
<td>$125,000</td>
<td>$210,553</td>
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<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>$125,000</strong></td>
<td><strong>$210,553</strong></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

* Expended as of 04 September 2020
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject: LH1277 IT Asset Replacement Program  

**RECOMMENDATION**  
That the Board of Management for the Lake Huron Water Supply System RECEIVE this report regarding the status of LH1277 IT Asset Replacement Program.

**PREVIOUS AND RELEVANT REPORTS**  
October 3, 2019  
Current Operating and Capital Budget Report  

**BACKGROUND**  
In 2015, the Lake Huron Primary Water Supply System, in partnership with the Elgin Area Primary Water Supply System, purchased and deployed new industrial data center (IDC) to modernize their SCADA and IT server environments at the water treatment plants and the offsite datacenter currently located at Museum London.

The approved 2020 Capital Budget establish the IT Asset Replacement Program (LH1277), which instituted a ten-year replacement schedule for all IT assets based on industry best practices. This included funding for the replacement of the industrial data center in 2020.

These replacement schedules are motivated by several factors, including:

a) Age related failure  
b) Cyber security  
c) Vendor support  

**DISCUSSION**  
The existing industrial data center equipment has served the Board well for almost five years, but several factors warrant its replacement:

a) Existing support and service contracts are due to expire this year;  
b) The industry standard is to replace this type of equipment every five years to ensure reliability and security;
c) Over the past five years, our data center needs have significantly increased, and the replacement data center will better accommodate our current and future needs; and,

d) Some components will soon be deemed “end of life” by their manufacturers, which will prevent future support and security updates.

Several vendors were evaluated, and Dell was selected based on the strength and cost of their proposed solution, as well as their status as a Vendor of Record with the City of London. As a Vendor of Record, competitive pricing and discounts have been pre-negotiated to streamline the purchasing process.

The new data center equipment will include all storage, computing, and networking needed for the SCADA environment at the water treatment plant as well as the offsite datacenter at Museum London. Dell will be the single point of contact providing support for the system for five years. After that five year period, the system will be due for replacement again, however the support can be extended on a year-by-year basis if deemed necessary and appropriate.

All equipment has been received and installation will begin in October. Software and firmware are currently being updated on the existing data centers to ease the transition. The old and the new data centers will run in parallel for a short period of time in order to verify their operation and migrate the data. Following that, the old data center will be decommissioned and removed.

The next several years of the IT Asset Replacement Program (LH1277) will focus primarily on upgrading aging and unsupported networking equipment. The next industrial data center upgrade is projected for 2025.

### PROJECT FINANCIAL STATUS:

<table>
<thead>
<tr>
<th>Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>$114,000</td>
</tr>
<tr>
<td>Software</td>
<td>54,000</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>$168,000</strong></td>
</tr>
</tbody>
</table>

**Total Approved Budget (2020)**

$425,000
CONCLUSION

Work is underway to replace the industrial data centre equipment to maintain its reliability, security, and support. Completing this work will reduce the Board’s risk of service interruption due to hardware failures, security incidents, and lack of vendor support.

Information for this report was provided by Richard Aycock, Information Security Supervisor.

Submitted by:  
Andrew Henry, P. Eng.  
Director, Regional Water Supply

Recommended by:  
Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Subject: LH1242 Pressure Transient Monitoring Project

RECOMMENDATION

That, on the recommendation of the Chief Administrative Officer, the Board of Management for the Lake Huron Primary Water Supply system RECEIVE this report regarding the LH1242 Pressure Transient Monitoring Project for information.

PREVIOUS AND RELATED REPORTS

October 4, 2018  2019 Operating & Capital Budgets

BACKGROUND

Assessment of hydraulic transients within a water system is an important consideration. Transients can occur when the transmission system changes from one hydraulic state to another, for example as flow in a pumping station / pipeline reverts from full flow to complete stoppage due to pump shutoff or valve closure. Typically, the worst-case condition occurs when an electrical power failure causes all duty pumps in a station to suddenly stop. When pipe wall degradation is combined with surge pressures, the likelihood of pipe failure can significantly increase. Evaluation of the pump station operation, such as pump start-up, range of flow, pressures (operating and surge) and surge protection can provide important information on the stresses inflicted on the pipeline. This vital information in conjunction with the acoustic fibre optic (AFO) monitoring can help predict when a section of the pipeline is close to failure and needs replacement before a catastrophic failure occurs.

In June 2019, the transient monitoring program was commissioned to further understand the operational and surge pressures within the primary transmission pipeline and to provide data for the hydraulic transient modeling undertaken as part of the design of the water treatment plant high lift pump replacements project.
DISCUSSION

Four (4) monitors were utilized with three (3) being installed at fixed locations. The remaining monitor was installed at various locations of interest along the pipeline on a periodic basis during the monitoring period. Pressure measurements were conducted in sections of the pipeline which were considered susceptible to pressure transients. Pressure transients that were generated during normal operations were measured in each selected section and transient data was recorded as follows:

- Normal operating background pressure readings taken every 2 to 4 minutes; and
- When rapid pressure change exceeds the threshold pressure change (impulse event), transient mode takes over and readings are taken at a frequency of 256 readings per second.

During the reporting period from June 2019 to June 2020 the Acoustic Fibre Optic Monitoring system detected 50 wire breaks on the transmission pipeline at various locations. Pressure monitoring data collected at the nearest upstream and downstream pressure monitoring sites was reviewed for the time and date of each acoustic wire break event and it was determined that none of the acoustic wire break events correlate to transient events recorded at their nearest upstream or downstream transient pressure monitoring sites.

Approximately 75 impulse events were recorded during the June 2019 to June 2020 period at the McGillivray Pumping station with a significant number of these events occurring from June to September 2019, with an average of 19 events per month. After September 2019, an average of two monthly impulse events occurred. This change in the number of events is related to an operational change at the Huron High Lift Pump Station in August 2019, initiated in direct response to the analysis of monitoring data and subsequent discussions with the contracted operating authority, the Ontario Clean Water Agency.
The figure below shows transient monitoring data for a pump trip due to a power failure at the water treatment plant.

![Transient Monitoring – Water Treatment Plant Power Failure Event January 19, 2020](image)

Surge protection requirements based on the transient analysis (validated with the transient monitoring data) conducted as part of the design of the high lift pump replacements project recommended the following enhanced transient protection:

- Adjustment of surge tank Hydro-pneumatic Air Chamber (HAC) probe level settings (to be undertaken as part of the high lift pump replacements project);
- Surge relief valve at HLPS (future capital);
- Provision of non-slam check valves for the station (to be undertaken as part of the high lift pump replacements project); and
- Air valve upgrades along the transmission main (future capital).

The transient monitoring program is recommended to continue until the new high lift pumps and the works noted above are in place. During this period, an additional monitor will be added to the system such that a comprehensive transient monitoring dataset across the primary and secondary pipelines is established.
FINANCIALS

Summary of Projected Costs

The following summary of estimated costs is provided for review and will be confirmed throughout the project:

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring</td>
<td>$161,728</td>
</tr>
<tr>
<td>Construction</td>
<td>$36,206</td>
</tr>
<tr>
<td><strong>Total Projected Costs</strong></td>
<td><strong>$197,934</strong></td>
</tr>
</tbody>
</table>

**Approved Budget** $220,000

Summary of Expenditures Incurred to Date as of August 28, 2020

The following summary of expenditures incurred to date:

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring</td>
<td>$62,933</td>
</tr>
<tr>
<td>Construction</td>
<td>$28,041</td>
</tr>
<tr>
<td><strong>Total Expenditures</strong></td>
<td><strong>$90,974</strong></td>
</tr>
</tbody>
</table>

**Budget Surplus/Deficit** $22,066
CONCLUSION

Transient monitoring on the primary transmission pipeline has determined that there is currently no correlation between wire breaks and transient surges. Transient monitoring data was used to validate the transient analysis developed as part of the design for the high lift pump replacements project.

The results of the transient analysis recommended enhanced transient protection as part of the high lift pump replacements project and future capital works. The monitoring program will continue until the enhanced transient protection is in place and a comprehensive transient monitoring dataset across the primary and secondary pipelines is established.

Information for this report was provided by Billy Haklander, Environmental Services Engineer with assistance of Dave Scott, Capital Projects Coordinator.

Submitted by: Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by: Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer
To: Chair and Members
Lake Huron Primary Water Supply System Board of Management

From: Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer

Subject: Port Blake Park

**RECOMMENDATION**

That, on the recommendation of the Chief Administrative Officer, the Board of Management for the Lake Huron Water Supply System **RECEIVE** this report for information.

**PREVIOUS AND RELATED REPORTS**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun.4, 2020</td>
<td>Master Water Plan</td>
<td>Authorize the initiation for a Microbial Inactivation and Storage Schedule B Environmental Assessment.</td>
</tr>
<tr>
<td>Dec.8, 2011</td>
<td>Port Blake Park</td>
<td>Authorize the execution of a Licence of Occupancy Agreement with South Huron for Port Blake Park.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Direct staff to seek opportunities with South Huron and Bluewater to improve the security of the water plant with specific regard to the public use of Waterworks Road.</td>
</tr>
<tr>
<td>Mar.20, 2008</td>
<td>Port Blake Park</td>
<td>Authorize South Huron to continue to operate Port Blake Park on condition of the execution of an interim agreement.</td>
</tr>
<tr>
<td>Oct.11, 2007</td>
<td>Port Blake Park</td>
<td>Authorize the execution of an agreement with South Huron for the operation of an area of the water treatment plant property as a day park and beach access.</td>
</tr>
</tbody>
</table>
BACKGROUND

Port Blake Park
The Municipality of South Huron currently occupies a portion of the water treatment plant property to operate as a day-use park, known as “Port Blake Park”, in accordance with a licence of occupancy agreement. The operation of the park area of the plant property is a longstanding arrangement with the municipality which precedes the transfer of the regional water system from the Province of Ontario in 2000 and was initiated with an arrangement between the Ausable Bayfield Conservation Authority and the Province of Ontario.

With the recent acquisition of the property municipally known as 71111 Bluewater Highway by the Lake Huron Water Supply system, there is an opportunity to relocate the access to the park area of the property from the shared location near the water treatment plant to the existing driveway entrance off of the provincial highway at 71111 Bluewater Highway.

In order to facilitate proposed improvements to the park area by the Municipality of South Huron, the municipality has proposed a new licence agreement to better codify the occupancy of the licenced lands.

Environmental Assessment - Microbial Inactivation and Storage
At the June 4, 2020 meeting, the Board of Management authorized the undertaking of a Municipal Class Environmental Assessment (Schedule B) related to the microbial inactivation and water storage needs at the water treatment plant. The Master Water Plan approved by the Board at the June 4th meeting identified the opportunity to improve the efficiency of the pump operation to the transmission system with the construction of an 10ML water storage reservoir at the water treatment plant. The Plan further noted that if the proposed reservoir were increased to 40ML, it would also address the inactivation requirements of the facility which resulted in the proposed construction of a UV Disinfection system. If the 40ML reservoir storage is constructed, at an estimated cost of $30 million, the currently approved $10 million construction of the UV Disinfection system would no longer be required.

If constructed, the 40ML reservoir would likely occupy a portion of the water plant property along Bluewater Highway, currently within the licenced area for Port Blake Park. If the 10ML reservoir is constructed, it is anticipated that the smaller storage structure can be accommodated within the existing water treatment plant operational area of the plant’s property.
DISCUSSION

In accordance with their Parks Master Plan, the Municipality of South Huron is proposing to make further investments in Port Blake Park; an area of the water treatment plant property occupied by the municipality under licence. With the water system’s permission, the municipality has previously constructed a washroom facility, lake observation area, and a pavilion. The park area also currently includes BBQ stands and fire pits, as well as open areas used by park visitors.

The existing park entrance from Bluewater Highway (provincial highway #21) is shared with the water treatment plant. The park entrance is currently control by manual gate and gatehouse, where visitors are charged an access fee for day use. It is staff’s understanding that the proposed enhancements to the park area will include an automated gate which will be activated upon automated payment of the usage fee, and can be utilized to limit the number of occupants to the park.

With the water system’s acquisition of the property municipally known as 71111 Bluewater Highway, which is surrounded by the water treatment plant property, a new entrance can be utilized for Port Blake Park using the existing driveway for the 71111 Bluewater Highway property. This location would avoid existing traffic conflicts at the entrance to the water treatment plant, as well as the anticipated location of the possible 40ML onsite reservoir.

To facilitate the municipality’s planned investments to Port Blake Park and clarify responsibilities related to the municipality’s occupancy of the water treatment plant property, the Municipality of South Huron has proposed to enter into a new agreement for the licence of occupancy for the park. The proposed licence agreement would specifically identify areas of the plant property where municipal park infrastructure could be erected (at the municipality’s cost) as well as clarify restrictions and obligations between the two parties.

The full scope of the proposed licence of occupancy agreement with South Huron is still being discussed and will be presented to the Board for consideration at a future meeting. At this time, it is not clear whether the municipality will want to include the beach access from the park as part of the licence agreement or exclude the beach access entirely. If the beach access is excluded, staff will recommend that the access stairwell/path from the park to the beach be closed and removed entirely in order to address liability. Should beach access be included, it is likely that the licence agreement would continue to exclude the public use of the beach area itself.

As a result of the initiation of the Environmental Assessment for the Microbial Inactivation and Storage at the water treatment plant, it is proposed that the licence agreement with South Huron not be finalized until the Environmental Assessment is substantially complete.
Anticipated Operating and Service Impacts

The Port Blake Park area of the water treatment plant is operated and maintained at the sole expense of the Municipality of South Huron. This includes water service to the washrooms, maintenance and repairs to the park amenities, and grass cutting, as well as gravel lane and parking area maintenance. In order to enhance the park area for park visitors, the municipality has also planted trees with the assistance of the Ausable Bayfield Conservation Authority, and is proposing plantings along the bluff and slope down to the beach area of the property to help deter the public from creating “goat paths” and exacerbating shoreline erosion.

The park area of the water treatment plant property has also been exempted from municipal taxes.

CONCLUSION

The Municipality of South Huron has requested that municipality and regional water supply enter into a new Licence of Occupancy Agreement for the municipality’s occupancy of a portion of the water treatment plant property operated as a day use park known as Port Blake Park.

Submitted by:
Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by:
Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer
To:  Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From:  Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject:  Waterworks Road  

**RECOMMENDATION**

That, on the recommendation of the Chief Administrative Officer, the Board of Management for the Lake Huron Water Supply System AUTHORIZE staff to examine options respecting the future of Waterworks Road with the Municipality of South Huron and the Municipality of Bluewater.

**PREVIOUS AND RELATED REPORTS**

Dec.8, 2011  Port Blake Park  
Direct staff to seek opportunities with South Huron and Bluewater to improve the security of the water plant with specific regard to the public use of Waterworks Road.

**BACKGROUND**

Waterworks Road is a boundary road between the Municipality of South Huron and the Municipality of Bluewater, and is used by the regional water system to access the water treatment plant. This access point to the property is the primary access for heavy equipment, chemical and material deliveries, as well as construction equipment.

Historically the municipalities and the water supply system have experienced challenges with regard to the public use of the dead end road. Most notably are the parking infractions along the south side of the road bordering the water treatment plant. South Huron has posted this side of the road as “No Parking”, however during peak summer months the public will often park on both sides of the road with overflow along the shoulder of Bluewater Highway (Provincial Highway 21). These circumstances have also contributed to security-related issues at the plant, including the prevention of chemical deliveries and trespass from Waterworks Road by the public, either inadvertently or intentionally, to access areas of the plant property to dispose of grass clippings and yard waste.

In addition to accessing the water treatment plant property, Waterworks Road is also used to access at least three cottages towards the Bluewater Highway end, as well as access/egress of emergency vehicles to the Highland One development to the north of Waterworks Road. Further to this, it is the understanding of staff that the Ministry of Transportation is considering
future intersection improvements at Bluewater Highway/Waterworks Road/Dashwood Road (County Road 83). Notwithstanding, there is no commitment on the extent or timelines for any proposed improvements at this location by the Province.

It should also be noted that the dead end of Waterworks Road is utilized by the water supply system to access the beach area of the water treatment plant property, often with heavy equipment, for inspection, maintenance and repair activities of buried infrastructure in this area.

**DISCUSSION**

The Municipality of South Huron and the Municipality of Bluewater have expressed interest in discussing the future use and disposition of Waterworks Road. The municipalities have asked that the Lake Huron Water Supply System participate in those discussions as a key stakeholder.

It is the understanding of staff that the municipalities would like to discuss all opportunities for the utilization and disposition of Waterworks Road, including but not limited to:

- the closure of Waterworks Road, in whole or in part;
- deem the road as surplus and transferring ownership to the Lake Huron Water Supply System and/or Highland One; and,
- the development of a Boundary Road Agreement between the municipalities.

In preliminary discussions with the municipalities, the goal would be to complete the negotiations by May 2021.

**Anticipated Operating and Service Impacts**

Until details of a possible solution are discussed and finalized, it is unknown if there will be any financial or legal implications to the Lake Huron Water Supply System. Notwithstanding, should the road be deemed surplus by South Huron and Bluewater, in whole or in part, there may be an opportunity for the safety-related improvements associated to truck turning/radius and accessing the loading dock at the water treatment plant.
CONCLUSION

The Municipality of South Huron and the Municipality of Bluewater have expressed interest in discussing the future use and disposition of Waterworks Road. The municipalities have asked that the Lake Huron Water Supply System participate in those discussions as a key stakeholder. The potential future use and disposition of the road adjacent to the water treatment plant property presents an opportunity for the water supply system to improve security and safety related issues related to property access.

Submitted by:  
Andrew Henry, P. Eng.  
Director, Regional Water Supply

Recommended by:  
Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Attachments: Appendix A – Waterworks Road
APPENDIX A: WATERWORKS ROAD
RECOMMENDATION

That, on the recommendation of the Chief Administrative Officer, the following actions be taken with respect to the Lake Huron Primary Water Supply System Shoreline Erosion Protection (LH1425) project:

a) The Board of Management for the Lake Huron Primary Water Supply system AUTHORIZE the Chair and Chief Administrative Officer to execute an agreement with J-AAR Excavating Limited at an estimated cost of $768,762.79 (excluding HST) for the construction of the Erosion Protection;

b) The Board of Management for the Lake Huron Primary Water Supply system EXTEND the existing engineering assignment with Baird Engineering for Contract Administration and Construction Supervision Services at an estimated cost of $65,000.00;

c) The Board of Management for the Lake Huron Primary Water Supply system APPROVE an increase to the project budget by $900,000 for a total budget of $1,000,000, it being noted that the funds will be provided from the Emergency Reserve Fund; and,

d) The Board of Management for the Lake Huron Primary Water Supply System RECEIVE this report for information.

PREVIOUS AND RELATED REPORTS

March 5, 2020 Huron Erosion Control

BACKGROUND

The significant increase in level of Lake Huron, coupled with the winter storms and lack of ice cover, has caused significant erosion along the Lake Huron shoreline in the area of the water treatment plant. Although the raw water pipeline from the intake structure to the plant is buried below the lake bottom, the erosion at the shoreline has exposed a normally buried chamber used to access the intake pipe. This location also serves as the access point for the chlorine...
line into the pipe interior and ultimately the intake crib located 2 kilometers offshore for the zebra and quagga mussel control system.

GM BluePlan from London and Baird Engineering from Toronto were engaged to undertake an assessment of the erosion control requirements for the long-term protection of the critical infrastructure and the shoreline in the area of the water treatment plant. The project required further consultation and approvals from the conservation authority, as well as provincial and federal agencies, in order to complete the long-term protection measures. Concurrently with this, Baird completed the detailed design and then oversaw the tendering process and contract award for the project.

The initial budget set for this project was sufficient to complete the temporary erosion control measures implemented last winter, as well as undertake the engineering assessment and initial design work, but did not include the cost of the long-term control measures as they were unknown at that time.

**DISCUSSION**

Baird Engineering completed the detailed design in July 2020 and prepared the tender in early August. Tender #20-113 was issued on August 24, 2020 with four (4) contractors submitting compliant bids on the closing date of September 21, 2020.

The pre-tender construction cost estimate for the proposed work (including engineering and contingency) prior to tender close was $500,000.00 (excluding HST). It has been indicated that since the pre-construction estimate, additional excavation and installation of fill and protection materials were required as a result of further erosion since the original site visit exposing more of the normally-buried infrastructure.

The acceptable bids received are summarized as follows:

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Tender Price (excluding HST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-AAR Excavating Limited</td>
<td>$768,762.79</td>
</tr>
<tr>
<td>2044970 Ontario Inc.</td>
<td>$804,537.50</td>
</tr>
<tr>
<td>560789 Ontario Limited o/a R&amp;M Construction</td>
<td>$965,725.00</td>
</tr>
<tr>
<td>L82 Construction Ltd</td>
<td>$1,040,720.00</td>
</tr>
</tbody>
</table>

The submitted tenders were evaluated by Baird Engineering and Board staff to ensure compliance with tender submission requirements. On this basis, the bid submitted by J-Aar Excavating Limited in the amount of $768,762.79 (excluding HST) is recommended to be accepted. The Tender process was undertaken with assistance provided by the Purchasing Division of the City of London, and conforms with the procurement policy of the Board as well as the City of London (*used as a guide*).
Based on the tender submissions, it is estimated that the project will be completed over eight weeks from the time of award.

### PROJECT FINANCIAL SUMMARY

This project was initiated and undertaken under the emergency provisions of the Board’s Procurement Bylaw. The following table provides a high-level summary of projected and incurred expenditures to date for the project:

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Projected</th>
<th>Incurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>$205,691.86</td>
<td>$93,229.51</td>
</tr>
<tr>
<td>Construction – Temporary Works</td>
<td>$18,859.76</td>
<td>$18,859.76</td>
</tr>
<tr>
<td>Construction – Permanent Works</td>
<td>$782,293.02</td>
<td>$0</td>
</tr>
<tr>
<td>Additional Services</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,006,844.64</strong></td>
<td><strong>$112,089.27</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approved Budget</th>
<th>$100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Projected Variance</strong></td>
<td><strong>($906,844.64)</strong></td>
</tr>
</tbody>
</table>

### CONCLUSION

Rising lake levels and winter storms have exposed a chamber at the shoreline at the water treatment plant. Board staff authorized the initial temporary protections needed to safeguard this critical component of the raw water intake, as well as the engineering assessment needed for the long-term protective measures. Once this project is completed, the beach chamber should be protected for years to come.

This report was written by John Walker, Operations Manager.
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Subject: LH1426 Microbial Inactivation and Storage Environmental Assessment  
– Contract Award

RECOMMENDATION

That the following actions be taken with respect to the Lake Huron Primary Water Supply System Microbial Inactivation and Storage Environmental Assessment:

a) That the Board of Management for the Lake Huron Primary Water Supply System ACCEPT the proposal from Jacobs in the amount of $416,921.00, including contingency excluding HST, having submitted a proposal which meets the Request for Proposal requirements and evaluated as having the best value;

b) The Lake Huron Primary Water Supply System Board of Management AUTHORIZE the Chair and Chief Administrative Officer to execute a consulting services agreement with Jacobs for the completion of a Microbial Inactivation and Storage Environmental Assessment for the Lake Huron Primary Water Supply System; and,

c) The Board of Management RECEIVE this report regarding the status of the Microbial Inactivation and Storage Environmental Assessment for information.

PREVIOUS AND RELATED REPORTS

June 4, 2020  
Master Water Plan Update

BACKGROUND

The recently completed Master Water Plan Update determined that the storage capacity of the Lake Huron WTP does not currently have sufficient standalone storage for optimal plant performance. In addition, the Master Water Plan identified the opportunity to utilize a proposed storage reservoir to meet the system’s CT requirements in lieu of the previously authorized UV Disinfection process. On this basis the Board authorized the creation of a capital project to initiate a Microbial Inactivation and Storage Schedule B Environmental Assessment to confirm the preferred solution recommended in the Plan for achieving microbial inactivation and addressing storage needs at the Lake Huron Water Treatment Plant.
DISCUSSION

In July 2020, Board staff released Request for Proposal RFP 20-48 that invited consulting engineering firms to submit a common proposal for the above noted Environmental Assessment. Three (3) consultants were invited to bid on the proposal and two (2) proposals were received by the closing date of August 10, 2020. The proposals from Jacobs Engineering and Aecom were reviewed by Board staff and evaluated against the requirements of the Request for Proposals document.

Based on this evaluation the proposal from Jacobs was deemed to have a best value to the Board and was selected by Board staff as the recommended proposal. The Request for Proposal process was undertaken with assistance provided by the Purchasing Division of the City of London, and complies with the procurement policy of the Board as well as the City of London (used as a guide).

The overall project budget for this project has been approved by the Board at $500,000. Jacob’s estimate for the fees associated with this assignment is $416,921.00, including contingency but excluding HST, based on their current work plan. It is therefore anticipated that the total cost for this project will remain below budget.

CONCLUSION

This Environmental Assessment will confirm the preferred solution recommended in the Master Water Plan Update for achieving microbial inactivation (CT) and addressing storage needs at the Lake Huron Water Treatment Plant.

In accordance with the Request for Proposal process Jacobs was deemed to have a best value to the Board and staff recommends that the Board accept their proposal to undertake the Master Water Plan Update.

Information for this report was provided by Brittany Bryans, Environmental Services Engineer.

Submitted by: Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by: Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject: LH1230 High Lift Pump Replacements - Motor Control Centre & Valve Pre-purchase  

RECOMMENDATION  
That, on the recommendation of the Chief Administrative Officer, the Board of Management for the Lake Huron Primary Water Supply system RECEIVE this report regarding the LH1230 High Lift Pump Replacements Project for information.  

PREVIOUS AND RELATED REPORTS  
October 5, 2017 2018 Operating & Capital Budgets  
October 4, 2018 LH1230 High Lift Pump Replacements Project – Engineering Award  
January 31, 2019 LH1230 High Lift Pump Replacement Project – IESCO Master Program Agreement and Project Incentive Contract  
October 3, 2019 LH1230 High Lift Pump Replacements Project Pump Purchase  

BACKGROUND  
The Energy Audit and Pump Optimization study identified an opportunity for significant energy savings and the optimization of pump operations with the replacement of the fifty-year-old high lift pumps that are original to the plant construction and nearing the end of their useful life. Specifically, the existing five-pump configuration would be changed with a six-pump configuration:  
- two existing pumps would remain (to be replaced in future)  
- three existing pumps would be removed, with two new high capacity pumps and two smaller capacity pumps installed.  

As a utility directly connected to the provincial electrical transmission system, the Lake Huron Primary Water Supply System (LHPWSS) is eligible under the Independent Electricity Systems Operator's (IESO) Industrial Accelerator Program for financial incentives for energy efficiency projects.
On March 21, 2019, the Board Chair and acting Chief Administrative Officer signed an Incentive Contract with the IESO for financial incentives associated with the above-noted project which requires that the four pumps be in-service by December 31, 2022. The estimated total financial incentives from the IESO is $1.32M.

Detailed engineering for the high lift pump replacement began in November 2018, and the pump pre-selection process was completed in October 2019. With the construction part of the project approved as part of the 2019 Capital Budget, the tender for construction and pump installation will be issued in early 2021 subject to the expected equipment delivery dates from the manufacturers for the pumps, electrical switch gear and valves.

**DISCUSSION**

*Medium Voltage Motor Control Centre*

In order to meet the strict funding deadlines and associated reporting requirements set by the IESO regarding the installation of the pumps, three (3) medium voltage motor control centre (MCC) suppliers were requested to submit proposals to be evaluated through a Request for Proposals (RFP) process consistent with standard procurement practices utilized by the City of London in accordance with their Purchasing Policy (*used as a guide*).

The MCC pre-selection RFP was issued on January 17, 2020 to Benshaw Canada Controls Inc. (Benshaw), Eaton Canada Ltd. (EATON) and Rockwell Automation Canada Ltd. (Rockwell). Proposals were received by Benshaw and EATON by the closing date of March 3, 2020 at 12:00 pm. Rockwell gave email notification on February 23, 2020 that they would not submit a proposal due to their inability to meet the terms and conditions specified in the RFP. It is noted that similar terms and conditions were included on other equipment pre-selection contracts; including those recently completed for the high lift pumps’ equipment processes at the Elgin Area Water Treatment Plant (WTP) and the Lake Huron (WTP).

The technical and financial information received from both bidders were evaluated and compared in detail. All MCC proposed by the suppliers met the technical criteria, achieved the minimum required operating efficiencies and would be manufactured within the timeframe required by the project. A comparison of the capital cost bid is presented in the table below:

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Capital Cost Bid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benshaw</td>
<td>$546,405</td>
</tr>
<tr>
<td>EATON</td>
<td>$1,145,310</td>
</tr>
</tbody>
</table>
Based on the submitted information, Board staff authorized Benshaw’s proposal for the Design, Fabrication, Supply, Delivery, Supervision of Installation and Commissioning of the High Lift Pump System Medium Voltage MCC. On this basis, Board staff issued a Letter of Intent and purchase order in the amount of $40,000.00 (excluding HST) for the for the preparation of shop drawings and the motor starting study to Benshaw on April 29, 2020. The Purchase Order for the supply of the MCC will be included in the general contract associated with the installation of the pumps.

**Combination Control and Check Valves**

New discharge control and check valves are needed for the new pump that will be installed in the spare pump bay as well as the three pumps that will be replaced to complement the new pumps to minimize energy loss to the extent possible. If possible, the existing valves will be salvaged and/or used as spare parts for the valves associated with the two existing pumps that remain.

The LHPWSS’ design consultant AECOM, undertook a detailed review of the discharge valves available from various suppliers that are relevant to our needs and narrowed the options to five different valve options. The options were evaluated based on various criteria that included but was not limited to:

- Maximum pressure class,
- Materials of construction,
- Leakage rate,
- Cavitation,
- Local maintenance support,
- Delivery time,
- Capital cost, and
- Energy cost difference.

On June 3, 2020, a workshop to evaluate the options was held to review AECOM’s assessment. In addition to AECOM’s design team, AECOM’s Water Treatment Senior Engineer and Advisor provided his recommendation during the discussion with Board staff and staff of the contracted operating authority, the Ontario Clean Water Agency (OCWA). The consensus from the workshop was to have the recommended supplier present details and additional specifications for the proposed valve to the group and have AECOM’s Pumping Stations Global Technical Practice Leader attend the presentation. This presentation was held on June 12, 2020. A project team meeting was held the following week at which it was recommended that AECOM proceed with issuing a Request for Quotation (RFQ) to the preferred vendor.
On July 16, 2020, AECOM issued an RFQ to Adams Valves Inc. (Adams) and Adams submitted their quotation on August 20, 2020. The technical and financial information received from Adams was evaluated and compared in detail to the terms of the RFQ. The proposal met the technical criteria, achieved the required operating efficiencies and is expected to be manufactured within the timeframe required by the project. The capital cost bid of the bid for all four valves was $656,095.00 USD.

Based on the submitted information, Board staff accepted the Adams’ proposal for the Design, Fabrication, Supply, Delivery, Supervision of Installation and Commissioning of the combination control and check valves. On this basis, Board staff issued a single source purchase order for $656,095.00 USD (excluding HST) for the valves.

**Isolation Valves**

The selection of a combined control/check valve to replace two valves on each pump discharge presents an opportunity to install a dedicated isolation valve for each pump discharge; something that the plant current does not have. Isolation valves on each pump discharge will enable the complete isolation of the combination valve and the high lift pump for maintenance and repair purposes. The lack of the isolation valve on the existing pumps requires the complete isolation of half of the discharge header Board (three pumps) in order to facilitate the repair to one pump, effectively limiting the pump capacity of the plant to half of its rated capacity.

Board staff have asked that AECOM proceed with the selection of pump discharge isolation valves for inclusion in the project. This process is ongoing but has been challenged due to the required pressure rating of the valve. Most American Water Works Association valve suppliers are unable to accommodate the required transient pressure. Board staff continue to seek suitable equipment but note that suppliers of this equipment appear to be limited. As such, it is expected that pre-selection and pre-purchase of this equipment will be needed to procure suitable isolation valves in order to meet the strict timelines of the overall project.

**Engineering Design Fees**

Over the course of the design and procurement efforts, it became clear that additional engineering effort was needed to procure ancillary equipment necessary to support the pump replacements and to ensure equipment delivery schedules in line with funding deadlines. This project was initiated primarily as a pump procurement and design for replacement assignment. Since then, it has been confirmed that much of the associated ancillary equipment requires upgrades or replacement in order to achieve the benefits of the pump upgrades.

Significant changes to the original engineering scope include:

- Pre-selection and shop drawing review for a complete replacement of the existing MCC,
- Assessment, selection, procurement, and shop drawing review of specialized combination check valves to replace the existing check valves and ball valves,
Assessment, selection, procurement, and shop drawing review of specialized isolation valves to support operations and maintenance activities,
Replacement of the existing ControlNet Flex I/O communication system with new Ethernet controls for the high lift pump replacements, and
Prequalification of general contractors.

The original engineering design fee estimate of $415,178 for this assignment was primarily related to the procurement of the high lift pumps and the design for their installation. This fee represented 3.5% of the estimated capital construction value. Although this was low for this typical engineering value metric, the fee was believed to be sufficient given the limited engineering expected at that time for the ancillary systems.

Given the significant upgrades to the pump discharge valves as well as the electrical and controls systems, a $198,700 increase in the estimated design fees to an upset limit of $613,878 is necessary. This is an engineering design fee of 5.7% of the estimated capital construction value. This percentage remains consistent with industry standards for engineering design services and is reflective of the engineering efforts required for this complex project.

FINANCIALS

The following is a summary of projected and incurred expenditures to date for the project:

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Projected</th>
<th>Incurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>$613,878</td>
<td>$489,061</td>
</tr>
<tr>
<td>Construction Supervision &amp; Contract Administration</td>
<td>$600,000</td>
<td>-</td>
</tr>
<tr>
<td>Construction</td>
<td>$10,700,000</td>
<td>$263,760</td>
</tr>
<tr>
<td>Additional Services</td>
<td>$50,000</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$11,963,878</td>
<td>$752,821</td>
</tr>
</tbody>
</table>

Approved Budget                $13,557,000
Projected Variance             $1,593,122

ANTICIPATED SCHEDULE

It is expected that an agreement for the construction/installation component of the High Lift Pump Replacements project will be executed with a contractor in early 2021 following the tender process. Construction and pump installation are expected to be complete by August 2022 and well before the in-service date (December 31, 2022) stipulated in the Incentive Contract with the IESO.
However, given the specialized nature of the project components, much of the equipment is sourced from international vendors and many of the suppliers have faced unanticipated challenges due to the global COVID-19 pandemic. The pump manufacturing company in Germany regrettably informed the LHPWSS of a schedule change for testing and delivery of the pumps. Several factors have contributed to this overall factory delay. KSB Pumps Inc. experienced a significant loss of time in order processing throughout the spring of 2020 due to labour disruptions and adapting to a work from home environment in response to the pandemic. Furthermore, loss of production efficiency associated with physical distancing of staff and other recent factory measures has forced the factory to adjust the machining, assembly, and testing schedules accordingly. The combined effect has led to an overall schedule change.

Adams Valves Inc., the pump control valve company located in Texas, USA, is facing similar challenges as are local suppliers (AECOM, the engineering design firm and Benshaw Canada Controls, Inc. the medium voltage motor control centre supplier).

Board staff have advised the IESO of the pandemic-related challenges and that the LHPWSS is making every effort to mitigate the scheduling impacts, including pre-purchasing and pre-selection of critical equipment, but that further compression of the installation aspects of the project will not be possible while ensuring the security of water supply to our customers. Board staff have emphasised that the LHPWSS is committed to the project and optimistic that the in-service date will be met but that the IESO should be advised that due to above noted disruptions this may not be possible and inquired if the IESO will be rescheduling the in-service date deadlines under the Program due to the global pandemic.

At the time this report was written Board staff have not received a response from the IESO but the IESO has informally confirmed by phone that they are in the process of reviewing the inquiry.
CONCLUSION

The High Lift Pump Replacements project provides a significant opportunity for energy savings and qualifies for an estimated $1.32M in financial incentives through Independent Electricity Systems Operator’s Industrial Accelerator Program. To meet the in-service deadline date associated with IESO’s financial incentives, Board staff have issued purchase orders to Benshaw Canada Controls for medium voltage motor control centres, Adams Valves for combination check and control valves to begin fabrication of same following shop drawing approval and in advance of the execution of the construction contract. Since the onset of the project, it has been confirmed that much of the ancillary equipment requires upgrades or replacement. Given the significant upgrades to the pump discharge valves as well as the electrical and controls systems, a $198,700 increase in the estimated design fees to an upset limit of $613,878 is necessary.

Information for this report was provided by Billy Haklander, Environmental Services Engineer.

Submitted by:
Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by:
Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer


To:  Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From:  Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject:  Contracted Security Services – Contract Award  

**RECOMMENDATION**

That, on the recommendation of the Chief Administrative Officer, the following actions be taken by the Board of Management for the Lake Huron Water Supply System:

a)  The Board of Management for the Lake Huron Water Supply System receive this report for information; and,  

b)  The Board of Management for the Lake Huron Water Supply System **ACCEPT** the proposal from Paladin Security Group Limited and **AUTHORIZE** the Chair and Chief Administrative Officer to execute an agreement for contracted security services at an annual cost of $273,476 for a three year term.

**PREVIOUS AND RELATED REPORTS**

June 8, 2017  Confidential Report – Security Audit and Threat Risk Vulnerability Assessment  

**EXECUTIVE SUMMARY**

A comprehensive security audit was last completed in 2017, which outlined substantive vulnerabilities and security related risks throughout the water supply system. Since 2018, Board staff have been addressing the identified deficiencies and vulnerabilities in the water system.

A Request for Proposals process was undertaken with assistance provided by the Purchasing Division of the City of London, and complies with the procurement policy of the Board and the City of London (used as a guide). Paladin Security Group Ltd. was identified as the preferred proponent having submitted a proposal which complies with the Request for Proposals process.
BACKGROUND

A comprehensive security audit and threat risk vulnerability assessment was last completed in 2017, which outlined substantive vulnerabilities and security–related risks throughout the water supply system. The Security Audit received and approved by the Board in closed session at its meeting on June 8, 2017.

The approved Security Audit included a significant number of recommended physical improvements at the water treatment facilities, as well as the pump stations, reservoirs, and control stations throughout the transmission system in order to address the safety and security of operational staff, the public, and the security of the water supply to benefiting municipalities in the region.

Starting with the 2018 Capital Budget, the Board of Management approved the establishment of capital project LH1229 Security Upgrades, funded over multiple years, to address the recommendations of the 2017 Security Audit and Threat Risk Vulnerability Assessment report. In addition, the audit report included specific recommendations related to security services necessary for the safety and security of the regional water system.

DISCUSSION

A detailed Request for Proposal was prepared and advertised on June 25, 2020 and three security companies submitted bids for consideration by the closing date of July 28, 2020. The estimate of the contract prior to the proposal closing was $350,000.00 per year.

Board staff reviewed and evaluated the proposals in accordance with the Request for Proposal documents. The financial information from only the proposals which passed the technical evaluation were opened.

The proposals received are summarized as follows:

<table>
<thead>
<tr>
<th>Security Company</th>
<th>Qualifications</th>
<th>Price*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissionaires Great Lakes</td>
<td>Pass</td>
<td>$ 266,742</td>
</tr>
<tr>
<td>Paladin Security Group LTD</td>
<td>Pass</td>
<td>$ 273,476</td>
</tr>
<tr>
<td>Neptune Security Services Ince</td>
<td>Fail</td>
<td>n/a</td>
</tr>
</tbody>
</table>

* excluding HST and annual price escalations

Based on this evaluation the proposal from Commissionaires Great Lakes was deemed to have a best value and was selected by Board staff as the preferred proponent. The Request for Proposal process was undertaken with assistance provided by the Purchasing Division of the City of London, and complies with the procurement policy of the Board as well as the City of London (used as a guide).
On August 24, 2020 Commissionaires Great Lakes withdrew their proposal due to issues being experienced as a result of the global COVID-19 pandemic. Commissionaires Great Lakes specifically noted that they were unable to meet the staffing needs of the Lake Huron Water Supply System as outlined in their proposal.

As a result, and following confirmation with the remaining proponent, Paladin Security Group LTD was selected as the preferred proponent.

**CONCLUSION**

The 2017 Audit Report included specific recommendations related to security services necessary for the safety and security of the regional water system. The Request for Proposals process undertaken for security services at the water treatment plant will address security and safety-related shortfalls identified in the audit.

The recommended proponent, Paladin Security Group Ltd., meets all qualifications required from the Request for Proposals process for the three-year contract term.

This report was written by Lisa McVittie, Security Manager.

Submitted by:
Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by:
Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject: LH1260 Coagulation Upgrade – Tender Award  

RECOMMENDATION  

That, on the recommendation of the Chief Administrative Officer, the following actions be taken with respect to the Lake Huron Primary Water Supply System Coagulation Upgrades (LH1260) project:  

a) The Board of Management for the Lake Huron Primary Water Supply System ACCEPT the bid from BGL Contractors Corp.;  

b) The Board of Management for the Lake Huron Primary Water Supply System AUTHORIZE the Chair and Chief Administrative Officer to execute an agreement with BGL Constructors Corp. (BGL) for the construction of the Coagulation Upgrades;  

c) The Board of Management for the Lake Huron Primary Water Supply system EXTEND the existing engineering assignment with Jacobs Engineering for contract administration and construction supervision services at an estimated cost of $736,000 (excluding HST); and,  

d) The Board of Management for the Lake Huron Primary Water Supply System RECEIVE this report for information.  

PREVIOUS AND RELATED REPORTS  

<table>
<thead>
<tr>
<th>Date</th>
<th>Report Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 5, 2015</td>
<td>Water Quality Facility Plan</td>
</tr>
<tr>
<td>October 4, 2018</td>
<td>2019 Current Operating &amp; Capital Budgets</td>
</tr>
<tr>
<td>March 7, 2019</td>
<td>LH1260 Flash Mixer Upgrade</td>
</tr>
</tbody>
</table>

BACKGROUND  

The proposed project, LH1260 Flash Mixer Upgrade, includes the replacement of the coagulant dosing system equipment to improve the treated water quality and overall plant performance at higher plant flows. It is anticipated that the completion of this project could decrease chemical cost by as much as than $100,000 per year and improve overall system efficacy.
Multiple studies, including the Pre-Treatment System Optimization Study at the Lake Huron WTP (CH2M, 2017), have identified the inefficient dispersion and mixing of the coagulant chemicals at the Lake Huron Water Treatment Plant (LHWTP) as an issue, resulting in over-utilization of chemicals to achieve the necessary treated water quality.

The water system’s Water Quality Facility Plan further showed that the Lake Huron plant is capable of effectively treating 260 to 290 MLD with source water turbidity up to 10 NTU before degraded treated water quality is apparent. This is well below the plant’s rated pumping capacity of 340MLD.

The plant’s source water, Lake Huron, frequently experiences turbidities above 100NTU during significant storms. This would mean that as the plant flow approaches 260MLD, the treatment systems would struggle to achieve the desired drinking water quality supplied to our benefiting municipalities.

The Pre-Treatment Study completed in May 2017 made several recommendations for consideration which would contribute to improved coagulation system performance, including:

- Relocation of the injection point for the coagulant chemicals, likely requiring a new coagulant dosing system;
- Installation of a deflector plate flash mixer inlet, deflecting the raw water flow and improving chemical mixing; and,
- Replacement of the flash mixers for more efficient and effective chemical mixing

Detailed engineering design for the coagulation upgrades commenced in mid-2019 and the final design was completed in July 2020. The design includes the installation of a jet-mixing system in the raw water conduit and the replacement of the coagulant dosing system.

Construction is anticipated to be completed by July 2021.

**DISCUSSION**

Jacobs finalized the detailed design in July 2020 and Tender #RFT20-101 was advertised on July 27, 2020. Three (3) contractors submitted compliant bids on the closing date of September 2, 2020. The pre-tender construction cost estimate of the proposed work, calculated prior to tender close, was $1,132,000 (excluding HST).
The acceptable bids received are summarized as follows:

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Tender Price (excluding HST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGL Contractors Corp.</td>
<td>$736,000.00</td>
</tr>
<tr>
<td>Straightline Group Inc.</td>
<td>$911,000.00</td>
</tr>
<tr>
<td>Finnbilt General Contracting Ltd.</td>
<td>$943,000.00</td>
</tr>
</tbody>
</table>

On this basis, the bid submitted by BGL Contractors Corp. in the amount of $736,000.00 (excluding HST) was accepted. The Tender process was undertaken with assistance provided by the Purchasing Division of the City of London, and conforms with the procurement policy of the Board as well as the City of London (used as a guide).

In the process of finalizing the detailed design, Board staff requested that Jacobs provide a work plan and fee schedule for contract administration and construction supervision services. The estimated cost to undertake the contract administration and construction supervision services associated with the project as submitted in their proposed work plan is $160,745 (excluding HST). Board staff have reviewed the proposal and recommend that the existing engineering assignment with Jacobs be extended accordingly.

### Project Financial Status

#### Summary of Projected Costs
The following summary of estimated costs is provided for review and will be confirmed throughout the project:

- Engineering Design & Tender Preparation $265,000
- Construction Administration & Inspection $161,395
- Construction $736,000

**Total Projected Costs** $1,162,395

**Approved Budget** $1,437,000
Summary of Expenditures Incurred to Date as of September 1, 2020

The following summary of expenditures incurred to date:

<table>
<thead>
<tr>
<th>Expenditure Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Design &amp; Tender Preparation</td>
<td>$141,292</td>
</tr>
<tr>
<td>Construction Administration &amp; Inspection</td>
<td>$-</td>
</tr>
<tr>
<td>Construction</td>
<td>$-</td>
</tr>
<tr>
<td>Ad Hoc Expenses</td>
<td>$43</td>
</tr>
<tr>
<td><strong>Total Expenditures</strong></td>
<td><strong>$141,335</strong></td>
</tr>
</tbody>
</table>

Forecast Budget Surplus/Deficit $274,605

CONCLUSION

This Coagulant Upgrade will improve pre-treatment efficiency and effectiveness at the Lake Huron WTP, as previously identified by the 2017 Pre-Treatment System Optimization Study and the 2015 Water Quality Facility Plan. The goal of this project is to improve treatment performance and ensure that treated water quality is not degraded at the higher plant flows.

It is anticipated that this project could decrease chemical cost by as much as $100,000 per year as a result of efficiency improvements.

On September 2, 2020, BGL Contractors Corp. submitted a bid within the approved project budget that was compliant with the tender process, specifications and project requirements. Therefore, Board staff recommend that the Chair and Chief Administrative Officer be authorized to execute an agreement with BGL for the construction of the Coagulation Upgrades. Board staff also recommend that the Board extend the existing engineering assignment with Jacobs to provide the contract administration and construction supervision services associated with the project.

Information for this report was provided by Brittany Bryans, Environmental Services Engineer.

Submitted by: Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by: Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer
To: Chair and Members
Lake Huron Primary Water Supply System Board of Management

From: Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer

Subject: Ailsa Craig Water Storage

RECOMMENDATION

That the Board of Management for the Lake Huron Water Supply System DECLINE the request from the Municipality of North Middlesex for a contribution in the approximate amount of $500,000 to the construction of the Ailsa Craig elevated water storage, it being noted that the contribution is a proportionate increase to the tower’s construction in lieu of additional storage at the McGillivray reservoir to address an estimated storage deficiency by 2038.

PREVIOUS AND RELATED REPORTS

None

BACKGROUND

The Municipality of North Middlesex currently does not have distribution storage for the community of Ailsa Craig. During emergencies and planned maintenance activities on the Lake Huron Water Supply System where water from the transmission system is unavailable, the municipality must provide emergency water supply via tanker trucks.

Municipalities are responsible for the operation of their respective distribution systems, including distribution-level water storage for fire and emergency water storage.

DISCUSSION

The Municipality of North Middlesex recently completed a Municipal Class Environmental Assessment process for water storage for the community of Ailsa Craig. The municipality is supplied with potable drinking water from the Lake Huron Water Supply System at numerous locations, including emergency supply pumps from the McGillivray Reservoir and direct connections from the transmission pipeline near Ailsa Craig.

The recommended option from the municipality’s Environmental Assessment was to construct an elevated storage tank (tower). The estimated cost of construction to the municipality is between $2.5 million and $3.0 million, including property acquisition, site works and replacing a segment of 200mm distribution main from the new water tower to the distribution system in Ailsa Craig.
The proposed location of the water tower is near the corner of West Corner Drive and Queen Street northeast of the community of Ailsa Craig. This location was selected based on available pressure on the Lake Huron transmission pipeline and the existing point of supply from the transmission pipeline to the community of Ailsa Craig via an unopened road allowance.

Fig. 1 – Water supply to Ailsa Craig and proposed tower location
Lake Huron Master Water Plan (2020)

The Lake Huron Water Supply System recently completed and updated the Master Water Plan for the regional water system. The Master Water Plan is updated every five-years and largely addresses long-term system growth and related infrastructure needs for the regional water utility, and incorporated into the subsequent Financial Plan (typically within two years).

The recent Master Water Plan identified a 0.2 ML water storage deficiency by approximately 2033, and a 0.7 ML deficiency in 2038, based on current facility utilization and growth rates. The deficiency is largely related to the partial reliance of North Middlesex on the reservoir for emergency storage. Several possible options were identified to address the deficiency, including:

- **Do Nothing** – the 18.2 ML water reservoir is coupled to a pumping station that is currently only utilized during peak demand days (typically 8 days per year). The option assumes that the risk related to the estimated deficiency is absorbed within current operations.
- **Adjust Operating Levels** – the 18.2 ML reservoir currently operates between pre-set operating levels. By increasing the allowable high-water level by 0.5m, the estimated deficiency of 0.7m is more than adequately addressed without additional construction.
- **Expand the existing reservoir** – The current reservoir is a single-cell reservoir constructed at ground level with a total volume capacity of 18.2 million litres. Additional reservoir storage would be added in approximately 18ML increments, similar to the existing reservoir at a cost of approximately $19 million, including additional land acquisition.

The option of adjusting the operating levels was recommended for further assessment and consideration over the next decade and would have no capital investment requirements.

The Municipality of North Middlesex recently met with Board staff to discuss the possibility of the Lake Huron Water Supply System to invest in a proportionate share of the Ailsa Craig Elevated Water Storage to address the identified 0.7ML storage deficiency at the McGillivray Reservoir. The estimated cost on a proportional basis for the additional 0.7ML of storage is $500,000.

At the time of the meeting, Board staff outlined the regional water system’s intention to increase the operating range of the reservoir to fully utilize the available storage for the region’s benefit. It was also noted that the addition of water storage by the Municipality of North Middlesex for Ailsa Craig would only benefit the community and not the regional water system.

Notwithstanding, the municipality has requested the Board’s consideration of a proportional contribution of approximately $500,000 from the Lake Huron Water Supply System to the construction of the Ailsa Craig elevated water storage tower, equivalent to the additional storage of 0.7ML.
Anticipated Operating and Service Impacts
The addition of 0.7ML of water storage to the proposed elevated water tank at Ailsa Craig would have no additional operating costs for the Lake Huron Water Supply System as the tower would be part of the municipal distribution system. The additional storage would also have no service impacts or benefit to the Lake Huron Water Supply System as water from the tower would not be able to supply into the significantly larger transmission system of the regional water supply.

CONCLUSION
The Municipality of North Middlesex has proposed to construct an elevated storage tank near the community of Ailsa Craig to address storage deficiencies within their water distribution system. The municipality has noted an estimated storage deficiency at the McGillivray Reservoir of 0.7ML by 2038, as identified in the Lake Huron Water Supply System’s Master Water Plan. The Municipality of North Middlesex has requested the Board’s consideration of contributing approximately $500,000 to the construction of the Ailsa Craig elevated water storage to address the identified deficiency of the McGillivray Reservoir.

The recommended option to address the McGillivray Reservoir deficiency is to increase the high water level of the reservoir by 0.5m, effectively increasing the water storage available at this location without additional capital construction.

Submitted by:  
Andrew Henry, P. Eng.  
Director, Regional Water Supply

Recommended by:  
Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer
To: Chair and Members  
Lake Huron Primary Water Supply System Board of Management  

From: Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer  

Subject: LH1429 South Filter Conduit Emergency Repairs  

RECOMMENDATION  
That, on the recommendation of the Chief Administrative Officer, the Board of Management for the Lake Huron Primary Water Supply System RECEIVE this report for information pertaining to the emergency repairs to the south filter conduit.  

PREVIOUS AND RELATED REPORTS  
None  

BACKGROUND  
The Lake Huron water treatment plant utilizes twelve (12) dual-media filters as part of the conventional water treatment process, divided into two banks of six filters each (commonly referred to as the “south” and “north” filters). Water from the sedimentation tanks flow through the anthracite/sand filters and into a common filtered water conduit before chlorine is added for primary disinfection. The north and south filtered water conduits then flow into clearwells under the plant.  

Each filter is periodically taken out of service for regular maintenance and inspection, as well as topping up of the anthracite media within the filter.  

DISCUSSION  
During a recent maintenance and inspection of filter #6 at the water treatment plant staff of the contracted operating authority, the Ontario Clean Water Agency (OCWA), found that water was draining from the filter even though all valves were confirmed to be closed. A subsequent inspection from within the south clearwell (clearwell #2) confirmed that water was leaking from the south filtered water conduit above into the clearwell. Further inspection also noted that water appeared to be leaking from filter number 8 and 10 as well.
Water within the filtered water conduits is unchlorinated as chlorine is added at the end of each conduit before entering into the clearwell. While the risk to human health from this leakage is considered insignificant due to the leakage rate(s) into the clearwell, compared to the volume of clearwell itself. In effect, a fractional percent of water is bypassing the chlorination stage; however, that water is chlorinated as it will achieve the Contact Time requirements prior to the first consumer.

Notwithstanding, the leakage of water from the filtered water conduit poses a significant risk to the water treatment system over time as the rate of leakage is likely to increase. Filter number 6 remains out of service, and the remaining five south filters are being assessed to determine if their removal from service is necessary as well. The removal of three filters from production effectively reduces the capacity of the plant by 25%.

Upon receipt of the inspection report and work plan for the repairs to the south filtered water conduit from OCWA, the Director of Regional Water, with the consent of the Chief Administrative Officer, authorized the repairs to be undertaken on an emergency basis.

The emergency authorization provisions of the Board’s Procurement Bylaw was used as the leakage of unchlorinated water must be addressed before the circumstances escalate to a point where human health may be at risk. In addition, as the repair work involves taking clearwell #2 out of service (reducing plant capacity to 50%), the repairs must be undertaken prior to the installation of the new high lift pumps in 2021.
CONCLUSION

During a recent maintenance and inspection of filter #6 at the water treatment plant, OCWA discovered that the filter was leaking water despite valves being confirmed closed. Upon further inspection, it was found that unchlorinated water was leaking from the south filter water conduit into clearwell #2.

The Director of Regional Water, with the consent of the Chief Administrative Officer, authorized the repairs to be undertaken on an emergency basis under the emergency provisions of the Board’s Procurement Bylaw.

This report was written by John Walker, Operations Manager.

Submitted by:  
Andrew Henry, P. Eng.  
Director, Regional Water Supply

Recommended by:  
Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Attachment: Appendix A – Photos of Leakage from the Filter Water Conduit.
APPENDIX A: PHOTOS OF LEAKAGE FROM THE FILTER WATER CONDUIT
RECOMMENDATION

That, on the recommendation of the Chief Administrative Officer, the following actions be taken with respect to the Lake Huron Primary Water Supply System LH1229 Security Upgrades project:

a) The Board of Management for the Lake Huron Primary Water Supply system ACCEPT the bid from Hardie Industrial Services at an estimated cost of $337,167.76 (excluding HST) for the installation and integration of security cameras at the Lake Huron water treatment plant;

b) The Board of Management for the Lake Huron Primary Water Supply system INCREASE the approved budget for LH1229 by $250,000 for a total approved budget amount of $600,000, it being noted that the additional funds are provided from the Capital Reserve; and,

c) The Board of Management for the Lake Huron Primary Water Supply System RECEIVE this report for information.

PREVIOUS AND RELATED REPORTS

March 5, 2020  (Confidential Report) Security Upgrades
June 8, 2017  (Confidential Report) Security and TRV Assessment

BACKGROUND

At the June 8, 2017 meeting, the Board received and approved the consultant’s report detailing the result of the security audit and threat risk vulnerability assessment for the Lake Huron Water Supply System. The report also detailed various recommendations, including significant upgrades and investments at the water treatment plant and satellite facilities for the regional water system.
Starting with the 2018 Capital Budget, the Board of Management approved a multi-year investment strategy to address the recommendations outlined in the Security Audit, with projected additional investments in each year until 2022.

The existing camera system is nearly twenty years old, prone to periodic failures and insufficient to adequately monitor the water treatment plant property.

**DISCUSSION**

Callidus Engineering was retained in February 2020 to undertake an assessment of the existing camera system at the water treatment plant and make recommendations to address issues identified in the security audit. Following the completion of the assessment, a tender was prepared and issued on August 4, 2020 for the installation and integration of a new security camera system.

Four qualified contractors submitted compliant bids on the closing date of August 24, 2020, summarized as follows:

<table>
<thead>
<tr>
<th>Contractor</th>
<th>Tender Price (excluding HST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardie Industrial Services</td>
<td>$337,167.76</td>
</tr>
<tr>
<td>Norlon Builders</td>
<td>$531,000.00</td>
</tr>
<tr>
<td>Allied Construction</td>
<td>$619,700.00</td>
</tr>
<tr>
<td>Bronnencode Construction</td>
<td>$649,180.00</td>
</tr>
</tbody>
</table>

The submitted tenders were evaluated by Callidus Engineering and Board staff to ensure compliance with tender submission requirements. On this basis, the bid submitted by Hardie Industrial in the amount of $337,167.76 (excluding HST) was accepted.

**PROJECT FINANCIAL SUMMARY**

This project is a multi-year infrastructure investment, starting in 2018, to address existing and proposed modifications and installation of security-related assets at the water treatment plant and facilities throughout the region. It is anticipated that additional funds will be added project budget in the Capital Budgets for 2021 and 2022 to address the remaining needs identified in the security audit.
To:  Chair and Members  
Lake Huron Primary Water Supply System Board of Management

From:  Kelly Scherr, P.Eng., MBA, FEC  
Chief Administrative Officer

Subject:  2021 Operating and Capital Budgets

RECOMMENDATION

That the following actions be taken by the Board of Management for the Lake Huron Water Supply System with regard to the 2021 Operating and Capital Budgets:

a) The Board APPROVE the 2021 Operating Budget in the total amount of $23,300,000 as presented;

b) The Board APPROVE the 2021 Capital Budget in the total amount of $4,747,000 as presented;

c) The Board RECEIVE the 2022 to 2030 Capital Forecast for information;

d) The Board APPROVE the 2021 rate for water of $0.5042 per cubic meter; and,


EXECUTIVE SUMMARY

The proposed operating and capital budgets present a balanced cost and revenue projection for 2021 but deviates from the water system’s Financial Plan approved in 2016. The proposed water rate for 2021 of 50.42 cents per cubic meter of water will adequately address capital, operating and administrative requirements as currently projected. The proposed rate represents an increase of only 1% over the 2020 rate, rather than the 3% projected in the 2016 Financial Plan.

The Financial Plan continues to be a key element in the long-term strategic approach that addresses both infrastructure and operating issues and ensures fiscal responsibility to maintain a reliable and sustainable water supply to the benefiting municipalities and consumers.

Cost projections presented in the 2021 budget include the operating costs within the extended term of the agreement with the contracted operating authority, which now incorporate the current and future costs for the operation of the new Residuals Management Facility.
The 2021 Capital Budget builds on the water system’s Asset Management Plan approved in 2016 and utilizes the Customer Level of Service framework and Risk Mitigation strategy previously approved by the Board. This includes the utilization of the business case process to better quantify anticipated costs, savings, and service impacts to the water supply system for options considered.

The projects and initiatives in the 2021 Capital Budget are presented in this report within two primary groupings; Maintain Level of Service (Maintain LOS) projects that serve to ensure that services are provided at the current level of service, and Improved Level of Service (Improved LOS) which address enhancements to levels of service, support growth of the system and increasing water demands, address regulatory changes, or increased efficiency. A proposed capital project may touch, in part, on all of these aspects, however they are presented within this report according to their respective primary driver.

The projected future capital expenditures include allocations for anticipated scheduled asset investments outlined in the Asset Management Plan (listed as “AMP Investments”). These are listed for projection purposes and are not associated with specific projects at this time. As the business cases are completed in each category, the AMP Investments will be eliminated in the projections in favour of specific asset improvements and refurbishments.

### PROPOSED 2021 OPERATING BUDGET

#### 2021 Water Rate

It is proposed in this budget that the water rate for the wholesale of water to the benefiting municipalities be set at $0.5042 per cubic meter (50.42¢ per cubic meter). In responding to regulatory, operational and inflationary pressures, this proposed 2021 rate represents a 1.0% increase from the current rate.

The rate proposed for the 2021 budget is **less** than the projected rate increase of 3.0% previously reported to the Board in the Financial Plan approved in 2016, largely due to the increased volume of water projected to be supplied to the benefiting municipalities in 2021 and cost efficiency efforts implemented within the operation of the system.
2021 Budget Volume
Allowing for the current rate of population and water demand growth within the benefiting municipalities, as well as anticipated impacts of continued water conservation, the proposed 2021 treated water volume included in the budget of 46,159,550 cubic meters represents an 1.2% increase compared with the 2020 approved budgeted volume, and approximately 3.3% lower than the anticipated 2020 actual supplied volumes.

<table>
<thead>
<tr>
<th>Approved 2020 budget volume</th>
<th>45,615,000 m³</th>
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</thead>
<tbody>
<tr>
<td>Anticipated 2020 year-end volume</td>
<td>47,748,163 m³</td>
</tr>
<tr>
<td>Proposed 2021 volume</td>
<td>46,159,550 m³</td>
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</table>

The long-term volume projections for the regional water systems have been re-evaluated in preparation for the 2021 budget and revised to incorporate increasing consumption trends within the City of London. Supplied volumes to the other benefiting municipalities continue to remain stable, with low to moderate long-term annual growth in consumption rates.

The anticipated 2020 year-end volume is reflective of the higher than normal temperatures being experienced in recent years, tempered by the onset of the COVID-19 pandemic in the spring. Staff expect that the short-term consumption will increase from the projections previously provided to the Board, largely due to the higher anticipated consumption by London, however a more conservative approach has been used for the 2021 budget and longer-term volume projections.

Water demand projections and anticipated capital works are reviewed regularly to ensure capital investments are appropriately coordinated and timed and will be reviewed again during future revisions to the Master Water Plan and Asset Management Plan. Further, the recently adopted business case process as part of the Asset Management Plan promotes a risk mitigation and level of service strategy which further addresses the appropriate timing of necessary projects.

Operating Costs
The two single largest operating costs for the water supply system are the contract costs for the operation and maintenance of the water supply system, and the purchase of electricity for the system. The 2021 budgeted operating costs are approximately $10.448 million, reflecting a net 1.4% projected decrease compared to the 2020 budget. Energy saving initiatives implemented at the facility are translating to an anticipated 7% decrease in energy costs, offsetting increases in other contracted services for 2020. Of the $10.448 million, energy comprises approximately 34% of operating expenditures.
The Service Fee currently paid to the Board’s contracted operating authority, the Ontario Clean Water Agency (OCWA), is solely comprised of general operating costs (labour, material and chemical costs, etc.) paid by the Board. As electricity can be highly variable on a year-over-year basis, the risk of market volatility has summarily been assumed by the Board and mitigated through the Board’s energy procurement strategy, as well as conservation and efficiency programs.

The Board previously received and accepted an energy, conservation and pump optimization study report which reviewed possible cost saving and efficiency measures related to the procurement and usage of electrical energy and the associated pump strategy for the system. A number of efficiency recommendations were received and incorporated into the Asset Management Plan and Financial Plan, which require the development of a business case to better quantify anticipated costs, savings, and service impacts. The proposed capital plan has begun to incorporate some of the impacts of energy efficiency projects, with further projects to be considered in future.

**Administration and Other Expenses**

The Administration and Other Expenditures projected for the 2021 budget of approximately $2.733 Million represents a $574,000 net increase over the 2020 budget amount. This net increase is due to numerous changes to the water supply system, including:

- Overhead and service costs: the administration charges paid to the City of London for such services as accounts payable/receivable, clerical support, and budget administration was increased to reflect current actual costs to the city. The amount charged by the Administering municipality is approximately proportionate to total expenses and has been adjusted to reflect the costs associated between this water system and the Elgin Area water system.
- Management & Administrative Personnel: projections for personnel costs have been adjusted as a result of increases reflective of Collective Agreements and cost of living increases.
- Significant increases to the Board’s property insurance and general liability insurance.
- The addition of contracted security services for the regional water system, as identified in the Security Audit and approved by the Board.

**Security Audit**

The previously completed and approved Security Audit and Threat Risk Vulnerability Assessment recommended a number of capital and operating investments to the regional water system, including staffing resources. The proposed 2021 Operating Budget includes an allowance for anticipated contracted security-related services. Board staff have completed the procurement for the contracted security service, which is the subject of a separate report to the Board.
Process Optimization

Over the next five to ten years, there will be a significant focus on process optimization in order to improve treatment and transmission system performance, efficiency, and effectiveness. This has the added potential to increase treatment capacity without the corresponding construction of new treatment processes (i.e. expanding the treatment plant).

While staff have undertaken several of the preliminary studies and investigations outlined in the Water Quality Facility Plan completed in 2012, greater efforts are now required to address subsequent findings as well as the optimization strategies outlined in the original 2012 Plan.

PROPOSED 2021 CAPITAL BUDGET

The proposed 2021 Capital Budget reflects a number of projects to address capital improvements and critical reinvestment in the water supply system's assets, as well as regulatory requirements, ongoing and proposed Board initiatives. Project specific summaries are provided in Appendix A of this report for the Board's information.

Financial Plan and Asset Management Plan

The approved Asset Management Plan and Financial Plan provided an assessment of anticipated capital projects, based on condition assessments, operational assessments provided by our contracted operating authority, and previously undertaken studies which were available at that time. In the development of the 2021 Capital Budget, a business case is created for each project which outlines the scope of the issue that needs to be addressed, options, cost estimates, and project dependencies. The business case process is linked with our Customer Level of Service framework and Risk Mitigation strategy in order to better prioritize and direct funds in a more strategic fashion and in consideration of financial constraints which may be experienced.

Within this framework, a capital project may be “lifecycle” in nature and required in order to maintain a level of service, and/or “service improvement” in nature which may address:

- Enhancement to the level of service (including safety and security, system resiliency, and working conditions);
- Support of system growth or growth in water demands;
- Address regulatory changes; and/or,
- Increase efficiency.
The level of capital investment will vary from year-to-year, most especially for projects related to system growth or water demand growth. The Asset Replacement Reserve is used for lifecycle projects (maintain LOS), while the Capital Reserve is used for system improvements. A given project, in principle, may address multiple elements within the Customer Level of Service framework (energy efficiency, health & safety, regulatory, performance, etc.), and therefore may require the utilization of both the Asset Replacement Reserve (lifecycle) and the Capital Reserve (service improvement and growth).

It is important to note that the anticipated projects outlined in the Asset Management Plan tend to be based on risk mitigation in the first five-year planning period, and systemic or age-related in nature for the remaining 25+ year planning period. In addition, the financial information presented in the Asset Management Plan is considered an "unconstrained" financial projection; meaning without consideration of such things as other operational needs and financial constraints (e.g. borrowing capacity) experienced by the water supply system.

The Financial Plan is utilized to incorporate the needs identified in not only the Asset Management Plan, but also the Master Water Plan (growth study) and other planning studies undertaken by the system, as well as the evolving operational and administrative needs of the system to better constrain the financial requirements and implications to the system. During the development of the annual budget the projections in the Financial Plan are measured and adjusted according to actual conditions, which will consequently affect the capital plan in each fiscal year.

The projected capital plan (2022 to 2030) includes an allocation for anticipated systemic but unspecified asset investments starting in 2023 (identified as “AMP Investments”. This reflects the age-related projections included in the previously approved Asset Management Plan. As condition assessments and risk assessments are completed, business cases will be undertaken to identify and prioritize the expenditures and replace these AMP Investments allocations in the long-term plan.

2021 Capital Plan

The Financial Plan approved by the Board recommends an average year-end balance for the Asset Replacement Reserve in the order of $4.747 million. Although the actual investment and rate of commitment may vary year to year, the current capital plan maintains the long-term average investment rate as outlined in the Asset Management Plan and Financial Plan.
In contrast, the Capital Reserve is intended to grow significantly over time to provide a sufficient base for funding large growth-related projects in future. The balance of generational investment equity (utilization of reserves established by current users versus debt incurred and paid by future users) has yet to be fully quantified, and will be addressed in future Master Water Plan and Financial Plan studies. While there are no significant growth-related expenditures within the current planning period (i.e. plant expansion or pipeline twinning), the results of the Master Water Plan currently underway as well as future iterations of the Asset Management Plan and Financial Plan, are likely to have an impact on the long-term financial requirements to address growth-related projects. Staff continue to be satisfied that the issue of generational equity can be addressed within a reasonable timeframe.

**Lifecycle Projects** (Maintain Level of Service)

Proposed projects in the 2021 Capital Budget which primarily address maintaining the system’s level of service are:

- Hydraulic/Transient Model Update
- Vehicle Door Replacements
- Obsolete Equipment Removal
- Service Water Pipe Replacement
- Safety Showers
- Flocc Gear Drive Replacement
- Plant Instrumentation
- Distressed Pipe Replacement
- Low Lift Pump Motor Replacements
- Interior Door Replacements
- McGillivray PS Electrical Upgrades

In addition to the above-noted capital projects, the 2021 Capital Budget includes LH1316 Annual Maintenance which funds, in part, maintenance and repair projects undertaken by the contracted operating authority, the Ontario Clean Water Agency. All maintenance and repairs of the system’s assets are the obligation of the contracted operating authority to undertake in accordance with the Service Agreement. For activities of maintenance and repair where the value of the material and any contracted specialty service exceed $30,000 (adjusted annually by CPI), the Board is responsible for the value of the work in excess of the $30,000 (as adjusted). To facilitate this work, the Capital Budget includes an Annual Maintenance project which is utilized to fund this contractual obligation of the Board.
**Service Improvement Projects** (Enhanced Level of Service, Regulatory Changes, Efficiency)

Proposed projects in the 2021 Capital Budget for which the primary driver is service improvement are:

- Security Upgrades
- Coagulant System Upgrades
- Safety Rail Replacement
- Ilderton Meter Chamber
- Crop Yield Monitoring (2014 Pipeline Twinning)
- Interior LED Lighting Upgrades
- Financial Plan Update
- Asset Management Plan
- SCADA/PLC - Software Review/Upgrade

A summary of the capital projects is provided in Appendix A of this report.

**Plant UV Disinfection and Water Storage**

While the water treatment system currently meets the disinfection requirements (Contact Time, or “CT”) for drinking water supplied to the benefiting municipalities, a previous study related to disinfection practices and related risks had recommended UV disinfection at the water treatment facility to address the long-term disinfection requirements of the system. Accordingly, the 2020 budget proposed in October 2019 included project LH1266 (Huron Plant UV Disinfection) in the amount of $1.2 million to undertake the detailed assessment and design of the system, and projected $8.25 million in 2022 for construction.

At the June 4, 2020 meeting, the Board received the updated Master Water Plan which, among other items, recommended the construction of water storage at the water treatment plant to improve treatment efficacy and pump efficiency. The Master Water Plan suggested a minimum 10 million litre reservoir to meet the immediate needs of the facility, and as much as 40 million litres for the long-term needs. The 40 ML storage would also address the long-term contact time disinfection requirements of the facility, potentially negating the need for the UV disinfection system previously proposed.

At the March meeting the Board authorized staff to proceed with a Municipal Class Environmental Assessment (project LH1426) process to determine the optimal solution for plant storage and disinfection requirements. This Environmental Assessment would determine if either the UV disinfection system would proceed, as previously planned, or the water storage reservoir as identified in the Master Water Plan.
While both the UV Disinfection and Water Storage projects are shown in the current budget, only one will proceed to construction between 2022 and 2024, but not both. Accordingly, there is a $25 million debenture requirement projected for 2024, which would be reduced or eliminated depending on whether the UV Disinfection project or the Water Storage project proceeds after the Environmental Assessment is completed.

**CAPITAL FORECAST**

A number of capital projects are projected beyond the 2021 Capital Budget year, which will have an impact on the financial forecast and future water rates for the water system. Some of these capital projects were anticipated in previous budget forecasts, and are now inclusive of approved Asset Management Plan and Financial Plan. As previously noted, staff undertake a complete business case assessment for each project to confirm the costs, timing, and priority of the project, consistent with our new Customer Level of Service framework and Risk Mitigation strategy.

**FLOW AND FINANCIAL ANALYSIS**

Included in the budget package is a projection of annual volumes and finances beyond 2021 and provides a summary analysis of one option for rate increases and the use of debt (if any). This projection has incorporated the principles and recommendations from the Financial Plan, but has been adjusted to reflect the higher than previously anticipated volume projections and corresponding revenues.

The projected operating expense in 2023 and beyond assumes that the future cost of operating the system is consistent with the amended operating agreement with the Ontario Clean Water Agency to 2022. In addition, energy expenditures projected beyond 2020 have assumed a reasonable escalation of costs, tied to the anticipated annual volumes projected and consequential savings from various efficiency-related investments.

As a direct result of the anticipated higher annual volumes, staff are currently projecting a 1.5% annual increase in the rate beyond the 2021 budget; roughly equivalent to three-quarters of the average rate of general inflation. This water rate projection, however, may be subject to change and revision as the update to the Financial Plan is completed in 2021 which incorporates the recently updated Master Water Plan (2019) as well as the Asset Management Plan being completed in 2021.

**Reserve Funds**

Conceptually, the Asset Replacement Reserve is required to provide a stable funding source for capital programs designed to replace, maintain and extend the asset life to its full potential. Accordingly, the contribution to the Asset Replacement Reserve fund year-over-year should be relatively consistent, on average over the long-term, with minor variations accounted for as the Asset Management Plan is implemented.
Conversely, the Capital Reserve Fund is intended for growth-related capital programs and various system and performance improvement initiatives. As these programs tend to be periodic in nature, the reserve fund balance in the Capital Reserve may significantly increase or significantly decrease in any given year depending on the programs undertaken.

The Emergency Reserve Fund is intended to fund unplanned and unanticipated emergency-related projects such as pipeline failures, tank ruptures and treatment process failures. In accordance with the Board’s direction, the target balance of the Emergency Reserve Fund is established at $5 million, wherein contributions will be discontinued when the Emergency Reserve Fund balance reaches the target value.

**Acknowledgement**
The preparation of the 2021 Operating and Capital budgets were undertaken by the Regional Water Supply Division staff, with the assistance of Debbie Gibson and City of London Financial Services.

<table>
<thead>
<tr>
<th>Submitted by:</th>
<th>Recommended by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Henry, P. Eng.</td>
<td>Kelly Scherr, P.Eng., MBA, FEC</td>
</tr>
<tr>
<td>Director, Regional Water Supply</td>
<td>Chief Administrative Officer</td>
</tr>
</tbody>
</table>

**Appendix A:**
2021 Capital Project Summary

**Attachments:**
2021 Operating and Capital Budgets, and Nine-Year Capital Forecast, October 8, 2020
Lifecyle Projects (Maintain LOS)
LH1242 – Hydraulic/Transient Model Update & Transient Monitoring (multi-year program): The last hydraulic model for the transmission system was completed in 2009. In addition, transient pressures within the transmission system have the potential to cause catastrophic failures to the various pumping systems and pipelines that supply the benefiting municipalities. This project continues the update to the hydraulic and transient model for the system, and incorporate the new high lift pumps proposed for the water treatment plant.

LH1263 – Low Lift Pump Motor Replacement (multi-year program): The age of the current motors for pumps 1, 2, 5 and 6 are 35-50 years old and well past their normal life expectancy. These motors have had multiple repairs and rebuilds since their original installation and, by nature of their age and non-ideal operating conditions, are very inefficient compared to current motors. The proposed project will replace these motors over a two-year period, starting in 2020, with more energy efficient equipment.

LH1264 – Overhead Truck Door Replacement (multi-year program): The existing vehicle garage doors at the Lake Huron water treatment plant and McGillivray Pumping Station are well past their normal service life. These doors are maintenance intensive with high heat loss during winter months. The project continues the replacement of the existing doors with a more energy efficient door.

LH1267 – Plant Interior Door Replacements (multi-year program): Due to the damp environment within the water treatment plant, many of the existing metal doors have failed or are showing signs of significant corrosion and deterioration. This project continues the replacement of interior industrial doors over a five-year period starting in 2020.

LH1268 – Obsolete Equipment Removal (multi-year program): Since the original construction of the water treatment plant, numerous projects have been undertaken which rendered some minor equipment obsolete or were otherwise abandoned without removal. Often the existence of abandoned equipment complicates future projects, including legacy wiring and code which can cause additional expense and time to rectify. This project proposes to remove legacy equipment throughout the facility.

LH1272 – Service Water Pipe Replacements (multi-year program): The existing cast iron service water piping is original to the plant construction. Sections of the service water piping are showing significant deterioration including advanced corrosion, leaking, and constrictions from tuberculation. The 2021 program proposes to replace sections of the service water piping within the water treatment plant as opportunities arise.

LH1278 – Safety Showers: Safety showers are required under the Occupational Health and Safety Regulation in the event that staff or visitors to the facility are contaminated from chemical or other material exposure that is harmful to human health. Safety Showers are
required to be readily available and located in the immediate area of the hazard. Most of the existing showers are original to the plant construction, require excessive maintenance and repairs, and do not meet the current regulatory requirements.

LH1284 – Flocc Gear Drive Repair (multi-year program): The existing gear drives for the flocculation system are original to the plant construction and require frequent and significant maintenance to continue its operation. The internal gears have excessively worn and rather than replacing the whole drive assembly, it has been determined that the best and most cost-effective solution is to replace the internal gears with made-to-specification replacements. This project proposes to repair one gear drive per year over a four-year period starting in 2020.

LH1317 – Distressed Pipe Replacement (multi-year program): As a result of the condition assessment, subsequent data from the Acoustic Fibre Optic Monitoring System within the 1200mm high pressure transmission pipeline, and the initial results of the predictive model for the deterioration of the transmission pipeline, this program proposes to replace high-risk pipe segments on a systemic basis. Future pipe replacements are projected based on current deterioration rates and information provided from our acoustic fibre optic monitoring system.

LH1338 – Plant Instrumentation (annual program): Much of the plant’s online analyzers are beyond their useful life. This program funds a systematic replacement of the water system’s online analyzers that are critically necessary to ensure ongoing compliance with regulations and the system’s Municipal Drinking Water Licence.

Service Improvement Projects
(Enhanced LOS, Growth, Regulator Changes, Efficiency)

LH1016 – Huron Safety Rail Replacement (multi-year program): During a Ministry of Labour inspection in 2018, the inspector found that safety railings throughout the water treatment plant were no longer compliant with Health & Safety Regulations and standards. As a result, staff developed a program to replace safety rails throughout the water system over a five-year period starting in 2020 on a risk/priority basis.

LH1020 – Financial Plan Update 2021: Every five years the regional water system undertakes a comprehensive review of financial policies and funding requirements to ensure the long-term sustainability of the regional water system. The Financial Plan incorporates the identified operational needs of the water system with the investments identified in the latest versions of the Asset Management Plan (systemic replacement and rehabilitation) and Master Water Plan (growth-related projects).
LH1229 – Security Upgrades (multi-year program): The recently completed Security Audit and Threat Risk Vulnerability Assessment provided policy, resource, and site-specific recommendations to mitigate security and safety risks at all facilities. The project proposed is a multi-year allowance to undertake security-related modifications to all facilities, based on the criticality assessment and recommendations of the security specialist.

LH1256 – Crop Yield Monitoring – 2014 Pipeline Twinning: The agreement with landowners affected by the twinning of the 1200mm high pressure transmission main in 2014 included crop-loss payments as a direct result of the construction activities based on an industry standard calculation of losses and crop recoveries. The agreement further requires that in the seventh, eighth and ninth year after construction a crop-yield monitoring program is to be undertaken with an agronomist to ensure losses within the easement are less than 20% in comparison to comparable areas outside of the easement. The proposed project funds a three-year monitoring program as previously agreed to with the individual landowners and landowners association.

LH1260 – Coagulant System Upgrade: Multiple studies have concluded that the existing coagulation treatment process is inefficient, and modifications to the process would result in greater chemical efficiency and effectiveness, as well as improved treatment reliability at higher plant flows. The engineering design work was approved for 2019 and the first phase of construction was funded in 2020. The 2021 portion of the project would see the final installation of the process improvements.

LH1270 – Interior LED Lighting Upgrades (multi-year program): Much of the interior lighting in the water treatment plants continue to be energy intensive incandescent and metal halide fixtures. This produces dim work areas and consumes significantly more energy than modern fixtures. This project replaces the existing interior fixtures with LED equipped lighting and motion sensors (where warranted) over a three-year period starting in 2020.

LH1433 – Asset Management Plan 2021: Every five years the regional water system undertakes a comprehensive review of asset conditions and the rates of repairs and replacements of the water system’s assets. The Asset Management Plan is integrated with the water system’s Customer Levels of Service and the Risk Mitigation strategy to ensure the timely and effective asset investment strategy for long-term sustainable system improvements.

While the Ontario Asset Management Planning Regulation (O.Reg.588/17) applies to all municipalities, the regional water system is exempt from the regulatory requirement for an Asset Management Plan. Notwithstanding, the water system has had an Asset Management Plan in place since 2007, and the latest iterations have been held out provincially and nationally as a best practice.

Ilderton Meter Chamber: The water meter measuring the supply to the village of Ilderton in Middlesex Centre is currently housed within the municipality’s pump station located after the municipality’s in-ground reservoir. The municipality utilizes the meter to control the pump
station. Rather than replacing the existing shared meter, the proposed project installs a new meter at the connection point prior to the municipal reservoir.

**SCADA/PLC – Software Review/Upgrade:** Ongoing maintenance and replacement of the Supervisory Control and Data Acquisition System (SCADA) and the associated programmable logic controllers (PLC) have focused on hardware replacement and server upgrades necessary to ensure the system continues to operate effectively and without undue risks. Notwithstanding, much of the software and firmware versions used throughout the system are out of date and require extensive review and upgrades to ensure the critical control systems that operate the treatment and pumping systems continue to operate. The project also will undertake a review to incorporate programming and date storage improvements throughout the system.
# Table of Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue and Expenditure Summary</td>
<td>1</td>
</tr>
<tr>
<td>Administration &amp; Other Expenditures</td>
<td>2</td>
</tr>
<tr>
<td>2021 Capital Plan with Forecast for 2022 to 2030</td>
<td>3-4</td>
</tr>
<tr>
<td>Capital Plan Sources of Financing</td>
<td>5</td>
</tr>
<tr>
<td>Reserve Fund Analysis and Continuity Schedules</td>
<td>6-8</td>
</tr>
<tr>
<td>Flow and Financial Analysis Summary</td>
<td>9</td>
</tr>
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# Lake Huron Primary Water Supply System
## 2021 Budget
### Revenue and Expenditure Summary

($000's)

<table>
<thead>
<tr>
<th></th>
<th>2020 Approved Budget</th>
<th>2021 Proposed Budget</th>
<th>Incr (Decr) Over 2020</th>
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<tr>
<td><strong>Revenue</strong></td>
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<tr>
<td>Volume Revenues</td>
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<td><strong>Total Revenue</strong></td>
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<td><strong>Expenditures</strong></td>
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<td>Operating Costs</td>
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<td>Debt Principal Repayments</td>
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<td>Interest on Long Term Debt</td>
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<td>Contribution to Reserve Funds</td>
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<td>78</td>
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<tr>
<td><strong>Total Expenditures</strong></td>
<td>$22,798</td>
<td>$23,300</td>
<td>$502</td>
<td>2.2%</td>
<td>$23,844</td>
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</tbody>
</table>

*subject to rounding

**Notes:**

1. A budget volume increase is anticipated in 2021 (from 45,615,000 m³ in 2020 to 46,159,550 m³ in 2021). Rates per m³ are proposed to increase by 1%.
2. Part of the operating costs are direct to the Lake Huron system (i.e. electricity, AFO Monitoring, etc.), while all other costs are fixed to the annual operating costs included in the Service Fee paid to the Ontario Clean Water Agency.
3. Refer to page 9 for more information on debt.
## Lake Huron Primary Water Supply System
### 2021 Budget
#### Administration & Other Expenditures
($000's)

<table>
<thead>
<tr>
<th>Administration &amp; Other Expenditures</th>
<th>2020 Approved Budget</th>
<th>2021 Proposed Budget</th>
<th>Incr (Decr) Over 2019</th>
<th>% Budget Incr (Decr)</th>
<th>2020 Year End Projection</th>
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<td>Purchased Services (Legal, Consulting, Locates etc.) (3)</td>
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<td><strong>$ 2,733</strong></td>
<td><strong>$ 574</strong></td>
<td><strong>26.6%</strong></td>
<td><strong>$ 2,064</strong></td>
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</table>

*subject to rounding

**Notes:**

1. Support and Overhead Costs reflect the costs charged by the Administering Municipality for various administrative functions (e.g. Finance, Purchasing, Human Resources, Risk Management, etc.).
2. Financial/Office Expenses include other administrative expenses such as leased space, training/seminars/conventions, computer leasing, and sampling and process optimization initiatives.
3. Increase in Purchased Services in the 2021 budget is associated with contracted security services for the water supply system.
## Lake Huron Primary Water Supply System
### 2021 Budget
#### 2021 Capital Plan with Forecast for 2022 to 2030

text: ($000's)

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Project Total</th>
<th>Prior Years Budget</th>
<th>2020 Approved Budget</th>
<th>2021 Proposed Budget</th>
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<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026 to 2030</th>
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cont’d
## Lake Huron Primary Water Supply System
### 2021 Budget
#### 2021 Capital Plan with Forecast for 2022 to 2030

($000's)

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>Prior Years Total</th>
<th>Prior Years Budget</th>
<th>2020 Approved Budget</th>
<th>2021 Proposed Budget</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026 to 2030</th>
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</tbody>
</table>

| $ 139,706 | $ 3,316 | $ 5,790 | $ 4,747 | $ 21,399 | $ 8,862 | $ 37,258 | $ 4,292 | $ 55,043 |

* subject to rounding

**Notes:**

1. Capital account for Board contributions to maintenance projects undertaken by the operating authority.
2. Environmental Assessment for plant storage (LH1426) will determine if UV Disinfection (LH1266) will proceed in 2022 or storage will proceed in 2024.
### Lake Huron Primary Water Supply System
#### 2021 Budget
##### Capital Plan Sources of Financing
($000's)

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<tr>
<th>Funding Source</th>
<th>2020 Approved Budget</th>
<th>2021 Proposed Budget</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
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<td>$4,747</td>
<td>$21,399</td>
<td>$8,862</td>
<td>$37,258</td>
<td>$4,292</td>
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*subject to rounding*
## Asset Replacement Reserve Fund Analysis and Continuity Schedule

($000's)

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<td>$ 8,447</td>
</tr>
<tr>
<td><strong>Reserve Fund Ending Balance</strong></td>
<td>$ 15,034</td>
<td>$ 9,710</td>
</tr>
</tbody>
</table>

* subject to rounding

**Notes:**

(1) The Asset Replacement Reserve Fund was established in 2008 to fund projects of a lifecycle nature to maintain existing levels of service and has an average annual target ending balance of $7.5M.

(2) Projected net interest earnings based on an average rate of anticipated sources and uses of funds.

(3) Drawdowns are based on full/committed capital needs and not intended to project the actual cash flow of funds being utilized in a particular year.
# Lake Huron Primary Water Supply System
## 2021 Budget
### Capital Reserve Fund Analysis and Continuity Schedule
($000's)

<table>
<thead>
<tr>
<th>Capital Reserve Fund (1)</th>
<th>Actual</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
<td>2020</td>
</tr>
<tr>
<td>Reserve Fund Opening Balance</td>
<td>14,886</td>
<td>19,729</td>
</tr>
<tr>
<td><strong>Sources:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Year Operating Contributions</td>
<td>5,609</td>
<td>6,612</td>
</tr>
<tr>
<td>Net Interest Earnings - 1% (2)</td>
<td>377</td>
<td>162</td>
</tr>
<tr>
<td><strong>Total Sources</strong></td>
<td>$ 20,872</td>
<td>$ 26,503</td>
</tr>
<tr>
<td><strong>Uses:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total System Improvement &amp; Growth Projects</td>
<td>1,143</td>
<td>3,348</td>
</tr>
<tr>
<td>Less: Other Funding Sources</td>
<td>(416)</td>
<td></td>
</tr>
<tr>
<td>Less: Debenture Requirement (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Current Year Fund Draws (3)</td>
<td>1,143</td>
<td>2,932</td>
</tr>
<tr>
<td>Prior Years Capital Expenditures (3)</td>
<td>10,826</td>
<td></td>
</tr>
<tr>
<td>Transfer to Asset Replacement Reserve Fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Uses</strong></td>
<td>$ 1,143</td>
<td>$ 13,757</td>
</tr>
<tr>
<td>Reserve Fund Ending Balance</td>
<td>$ 19,729</td>
<td>$ 12,746</td>
</tr>
</tbody>
</table>

* subject to rounding

**Notes:**
1. The Capital Reserve Fund was established to fund projects of a growth nature, enhancing levels of service, or address issues which are regulatory or safety in nature.
2. Projected net interest earnings based on an average rate of anticipated sources and uses of funds.
3. Drawdowns are based on full capital needs and not intended to project the actual cash flow of funds in a particular year.
## Lake Huron Primary Water Supply System
### 2021 Budget
#### Emergency Reserve Fund Analysis and Continuity Schedule
($000's)

<table>
<thead>
<tr>
<th>Emergency Reserve Fund (1)</th>
<th>Actual</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
<td>2020</td>
</tr>
<tr>
<td>Reserve Fund Opening Balance</td>
<td>4,524</td>
<td>4,846</td>
</tr>
<tr>
<td><strong>Sources:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Year Operating Contributions</td>
<td>237</td>
<td>1,125</td>
</tr>
<tr>
<td>Net Interest Earnings - 1% (2)</td>
<td>110</td>
<td>54</td>
</tr>
<tr>
<td><strong>Total Sources</strong></td>
<td>$ 4,871</td>
<td>$ 6,025</td>
</tr>
<tr>
<td><strong>Uses:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Year Capital Expenditures (3)</td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>Prior Years Capital Expenditures (3)</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td><strong>Total Uses</strong></td>
<td>$ 25</td>
<td>$ 109</td>
</tr>
<tr>
<td><strong>Reserve Fund Ending Balance</strong></td>
<td>$ 4,846</td>
<td>$ 5,916</td>
</tr>
</tbody>
</table>

* subject to rounding

**Notes:**
(1) The Emergency Reserve Fund was established in 2011 to fund projects that arise on an emergency basis. This funding is to be in place outside of the Capital and Asset Replacement Reserve Funds and their defining guidelines. Contributions will be capped once the reserve fund balance reaches $5.0 million.

(2) Projected net interest earnings based on an average rate of anticipated sources and uses of funds.

(3) Drawdowns are based on full capital needs and not intended to project the actual cash flow of funds in a particular year.
## Lake Huron Primary Water Supply System
### Flow and Financial Analysis Summary

### ($000's)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Actual</th>
<th>Approved</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
<td>2020 Budget</td>
<td>(Projected)</td>
</tr>
<tr>
<td>Rate Increase (1)</td>
<td>2.0%</td>
<td>1.0%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Total Flow m³</td>
<td>46,204,139</td>
<td>45,615,000</td>
<td>47,748,163</td>
</tr>
<tr>
<td>Total Water Rate $/m³</td>
<td>0.4943</td>
<td>0.4992</td>
<td>0.4992</td>
</tr>
<tr>
<td>Other Revenue</td>
<td>27</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>Total Revenue</td>
<td>$22,865</td>
<td>$22,798</td>
<td>$23,844</td>
</tr>
<tr>
<td>Operating Expenses (2)</td>
<td>9,726</td>
<td>10,595</td>
<td>9,662</td>
</tr>
<tr>
<td>Administrative Expenses</td>
<td>2,055</td>
<td>2,159</td>
<td>2,064</td>
</tr>
<tr>
<td>Debt Servicing Costs (3)</td>
<td>1,381</td>
<td>1,381</td>
<td>1,381</td>
</tr>
<tr>
<td>Total Operating &amp; Administrative Expenses</td>
<td>$13,162</td>
<td>$14,135</td>
<td>$13,107</td>
</tr>
<tr>
<td>Asset Replacement Reserve Fund Contributions</td>
<td>3,857</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Capital Reserve Fund Contributions</td>
<td>5,609</td>
<td>5,663</td>
<td>6,612</td>
</tr>
<tr>
<td>Emergency Reserve Fund Contributions</td>
<td>237</td>
<td>-</td>
<td>1,125</td>
</tr>
<tr>
<td>Total Expenses</td>
<td>$22,865</td>
<td>$22,798</td>
<td>$23,844</td>
</tr>
</tbody>
</table>

* subject to rounding

### Notes:

1. Rate increases recommended are consistent with the approved Financial Plan which provide for prudent financial planning to accommodate inflation, new capital requirements and adequate reserve fund balances.
2. Operating expense projections reflect annual inflationary increases and anticipated adjustments, in accordance with the service agreement with the contracted operating authority.
3. Debenture Requirements:
   - Debt authorized (2007) for the PLC & SCADA Systems Upgrade (LH1330) in the amount of $1.75M was issued in 2012 with payments beginning in 2013 (all-in interest rate of 2.8% for a 10 year term).
   - Debt authorized (2006) for the Backup Generator (LH1326) in the amount of $1.5M was issued in 2012 with payments beginning in 2013 (all-in interest rate of 3.3% for a 10 year term).
   - Debt authorized (2011) for the Residue Management Plant (LH1902) in the amount of $16M was partially issued in 2015 ($7M) with payments beginning in 2016 (all-in interest rate of 1.9% for a 10 year term). It is not expected that any further debt will be required for this project.
   - Debt authorized (2012) for the Huron Transmission Main Twinning (LH1305) in the amount of $4M was partially issued in 2015 ($1.665M) with payments beginning in 2016 (all-in rate of 1.9% for a 10 year term). Further debt issuance in 2017 in the amount of $0.4M and payments beginning in Sept/17 (all-in rate of 2.48% for a 10 year term). It is not expected that any further debt will be required for this project.
   - Rates noted above could change depending upon market conditions at the time of debt issuance.
The following table provides a high-level summary of projected and incurred expenditures to date for the project:

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Projected*</th>
<th>Incurred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>$ 41,467.22</td>
<td>$ 18,699.42</td>
</tr>
<tr>
<td>Construction</td>
<td>$ 130,095.10</td>
<td>$ 127,376.24</td>
</tr>
<tr>
<td>Camera Installation</td>
<td>$ 380,999.57</td>
<td>$ 0</td>
</tr>
<tr>
<td>Additional Services</td>
<td>$ 5,186.05</td>
<td>$ 5,186.05</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$557,747.94</strong></td>
<td><strong>$151,261.71</strong></td>
</tr>
</tbody>
</table>

**Approved Budget**

$ 350,000

**Projected Variance**

($ 207,747.94)

*Projected expenditures exclude the scope of future capital investments to be included in the 2021 and 2022 Capital Budgets

**CONCLUSION**

The installation and integration of new security cameras at the water treatment plant is critical to the appropriate and adequate monitoring of the water treatment plant property and the safety of staff. The proposed system meets the needs identified in the security audit, and is required with the deployment of contracted security services at the end of this year.

The bid submitted by Hardie Industrial Services meet the specifications and requirements of the tender issued in August 2020.

This report was written by Lisa McVittie, Security Manager.

Submitted by: Andrew Henry, P. Eng.
Director, Regional Water Supply

Recommended by: Kelly Scherr, P.Eng., MBA, FEC
Chief Administrative Officer