AGENDA

Town of Lunenburg Council Meeting

Tuesday, November 24, 2020 at 6:00 p.m.

Lunenburg Town Hall, 120 Townsend Street

and via Zoom/YouTube Live Broadcast

1. Call to Order – Mayor Risser.

2. Acknowledgement of Mi'kma'ki the ancestral and unceded territory of the Mi'kmaq People – Mayor Risser.

3. Agenda - motion to approve.

Motion: moved by _____, seconded by _____ to approve the agenda.

4. November 17, 2020 Council meeting minutes - motion to approve.

Motion: moved by _____, seconded by _____ to approve the November 17 Council meeting minutes.

5. Public Hearings, Presentations and Questions

   a. Lunenburg Flood 3-D Modeling Project Presentation - Barry Stevens, 3-D Design (information report);

   b. Wastewater Treatment Plant Flood and Salt Water Intrusion Study Reports and recommendations – Sarah Ensslin, P. Eng.; and

   c. Wastewater Treatment Plant UV light and polymer testing analysis – Dr. Graham Gagnon, PhD, P. Eng.

6. Correspondence, Petitions and Proclamations consideration

   a. News release Nova Scotians to Have Input on New Traffic Safety Act Drivers Regulations (information only – Public Works to advise of any potential submission);

   b. Email of appreciation from the Lunenburg Folk Harbour Festival for the Town's financial support of the Lunenburg Heritage Bandstand Summer Concert Series (information only – wiring repair referred to Public Works);

   c. Copy of a letter from the Town of Oxford to Premier McNeil seeking Arena pandemic funding assistance (information only - Province has provided funding to municipalities to offset pandemic deficits and unanticipated expenditures);

d. NS Department of Business release about the Provincial "Tourism Accommodations Real Property Rebate Program …(providing) qualified operators a 25 per cent rebate on payment of 2020-21 commercial property tax" (information only); and

e. Canada-Nova Scotia Offshore Petroleum Board News Release Draft Western Scotian Shelf and Slope Strategic Environmental Assessment Opportunity to Provide Comments (information only).

7. Business arising from the Minutes/Unfinished Business

a. Corporate Services

i. Proposed adoption of a revised Solid Waste Management Bylaw by motion to give second/final reading to adopt – Town Solicitor overview

Motion: moved by Deputy Mayor Mosher, seconded by _____ that Council hereby gives second and final reading of the adoption of the revised Solid Waste Management Bylaw (Schedule "A"). The effective date of the revised Bylaw is the date on which it is advertised in the local newspaper pursuant to the NS Municipal Government Act.

ii. Proposed repeal of the Council Procedure Bylaw by motion to give second/final reading to repeal – Deputy Mayor Mosher

Motion: moved by Deputy Mayor Mosher, seconded by _____ that Council hereby gives second and final reading of the repeal of the Council Procedure Bylaw (Schedule "B") which is replaced by the Council and Committee Meetings and Proceedings Policy. The effective date of the Bylaw repeal is the date on which it is advertised in the local newspaper pursuant to the NS Municipal Government Act.

iii. Proposed repeal of the Committees and Boards Bylaw by motion to give second/final reading to repeal – Deputy Mayor Mosher

Motion: moved by Deputy Mayor Mosher, seconded by _____ that Council hereby gives second and final reading of the repeal of the Committees and Boards Bylaw (Schedule "C") which is replaced by the Committees of Council Policy pursuant to the NS Municipal Government Act.

iv. 2020/21 Council external Committee and Board appointments - motion to approve

Motion: moved by _____, seconded by _____ that the 2020/21 Council external Committee and Board appointments are approved as set out in the attached appointments list (Schedule "D").

b. Public Works Department

i. Wastewater Treatment Plant and Outfall Extension Project Update – staff report and draft motion to issue a Request for Proposals for pre-design engineering services

Motion: moved by _____, seconded by _____ that Public Works issue an RFP for the Preliminary Design of the WWTP and sewer outfall upgrades based on the scope and timelines as outlined in this report and to be tendered and awarded by Council in 2020 if possible (Schedule "E").

ii. Wastewater Treatment Plant Operating Manual Project – staff report and draft motion

Motion: moved by _____, seconded by _____ that Public Works issue a Purchase Order to CBCL for the creation of an Operating Manual for the Wastewater Treatment Plant that meets the condition of the Operating License with funding from the 2020/21 sewer revenues (Schedule "F").

iii. Tannery Road proposed sidewalk project – staff report and draft motion

Motion: moved by _____, seconded by _____ to proceed with Phase 1 Pre-Construction of the project to secure the land agreements. Once the land is secured to issue a Design-build RFP for the design and construction of a new sidewalk along the north side of Tannery Road for construction in 2022 depending on budget capacity.

8. Committee Meeting Minutes, Recommendations, Reports and Notices of Motion

a. Project Lunenburg/Comprehensive Community Plan Steering Team November 4 and 18, 2020 meeting minutes; and

b. Joint Occupational Health and Safety Committee November 5, 2020 meeting minutes.

9. New Business

a. Corporate Services

i. Masonic Lodge request to reproduce the Town logo on their 200th anniversary crest pursuant to the Sale, Reproduction and Use of the Town's Flag and Logo Policy - motion to approve and revise the Policy

Motion: moved by _____, seconded by _____ that Council approves the request of the Masonic Lodge to reproduce the Town logo on their 200th anniversary crest (Schedule "G") as per Town Policy for which no fee shall be paid. And further, staff shall amend the Policy to allow staff to approve any such requests and applicable terms and conditions in future.

ii. Budget 2020/21 Variance Report to September 30, 2020 including the announcement of $287,930 Provincial/Federal COVID-19 pandemic relief Safe Restart Agreement funding – staff report and draft motion

Motion: moved by _____, seconded by _____ that the $287,930 Safe Restart Funds be taken into operating revenues for fiscal 2020/21.

iii. Lunenburg Board of Trade request for a $1000 Christmas holiday season promotional grant – draft motion contained in Budget Variance report

Motion: moved by _____, seconded by _____ that Council approves the request of the LBOT for a $1000 grant for Christmas holiday season lighting and other promotions (Schedule "H") from the Town's Electric Utility budget.

iv. Proposed amendment to section 3 (3), Council and Committee Meetings and Proceedings Policy relating to the start of regular Council meetings from 5:15 p.m. to 6:00 p.m. – draft notice of motion by Deputy Mayor

I, Deputy Mayor Mosher, give notice of motion of a proposed amendment to section 3 (3) of the Council and Committee Meetings and Proceedings Policy (Schedule "I") by deleting the time 5:15 p.m. and substituting therefor the time 6:00 p.m. as the start time for regular Council meetings is hereby given. Final reading of this proposed Policy amendment adoption will be given at the December 8, 2020 Council meeting.

10. Meet in camera

Motion: moved by _____, seconded by _____ to meet in camera pursuant to section 22 Municipal Government Act to consider the following agenda items.

a. Proposed realtor services for the sale of 37 Tannery Road and donation of some contents pursuant to section 22 (2) (a) Municipal Government Act.
b. Starr Street lease consideration pursuant to section 22 (2) (a) Municipal Government Act.
c. Legal advice eligible for solicitor-client privilege pursuant to section 22 (2) (g) Municipal Government Act.
d. Labour relations pursuant to section 22 (2) (d) Municipal Government Act.
e. Personnel matters pursuant to section 22 (2) (c) Municipal Government Act.

11. Resumption of Council meeting in public session - motion to consider any in camera meeting notices of motion and recommendations pursuant to section 22 Municipal Government Act.

12. Adjournment – Mayor Risser.

Agenda items awaiting staff reports, etc. for further consideration

Agenda Items	Department	Council Meeting	Status
Blockhouse Hill development additional staff report	Corporate Services	August 25, 2020	Additional planning and development options report to be prepared
Anti-racism Special Committee membership and draft terms of reference	Corporate Services	August 25, 2020	Additional report regarding draft terms of reference and membership nomination update being prepared
Cultural Action Plan	Corporate Services	September 8, 2020	Staff will prepare a report about what the expectations of Town are and suggested resources
Solar Project Budget 2021/22 report	Public Works	October 13, 2020	Staff will prepare a report
Residential water meters implementation and rate application overview	Public Works	October 13, 2020	Staff will prepare a report
Watershed boundary extension and land management plan with external resources	Public Works	October 13, 2020	Staff will prepare a report
Project Lunenburg Comprehensive Community Plan	All Departments	November 17, 2020	First quarterly progress report March 2021

TOWN OF LUNENBURG SPECIAL COUNCIL MEETING

TUESDAY, NOVEMBER 17, 2020 AT 6:00 P.M.

LUNENBURG TOWN COUNCIL CHAMBER

IN PERSON AND VIA ZOOM/YOUTUBE LIVE BROADCAST

PRESENT: Mayor Matt Risser
Deputy Mayor Peter Mosher
Councillor Jenni Birtles
Councillor Melissa Duggan
Councillor Stephen Ernst
Councillor Ed Halverson
Councillor Susan Sanford

ALSO PRESENT: Lisa Dagley, CPA, CGA, Finance Director
Dennis MacPherson, P. Eng., Town Engineer
Heather McCallum, Assistant Municipal Clerk
Bea Renton, CAO

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1. Call to Order

The Mayor called the meeting to order at 5:58 p.m. welcoming everyone to the meeting.

2. Acknowledgement of Mi'kma'ki the ancestral and unceded territory of the Mi'kmaq People

The Mayor spoke of Lunenburg's location on the unceded territory of the Mi'kmaq People.

3. Agenda

Motion: moved by Councillor Halverson, seconded by Councillor Birtles to approve the agenda. Motion carried.

4. November 10 and 12, 2020 Council Meeting Minutes

Motion: moved by Councillor Sanford, seconded by Councillor Ernst to approve the November 10 and 12, 2020 Council meeting minutes. Motion carried.

5. Public Hearings, Presentations and Questions

Nil.

6. Correspondence, Petitions and Proclamations consideration

Nil.

7. Business Arising from the Minutes/Unfinished Business

Nil.

8. Committee Meeting Minutes, Recommendations, Reports and Notices of Motion

Nil.

9. New Business

   a. Comprehensive Community Plan and 35 actions selected for the Five-Year Implementation Plan

The Planning and Development Manager summarized her report (Schedule "A") regarding the Plan for Council's consideration.

The Mayor noted that correspondence was recently received from Paula K. Howatt, Pelham Street property owner, expressing concern about short term accommodation provisions contained in the Plan (Schedule "B"). She is requesting Town Council's deferral of the Plan's approval. Council noted that this component of the Plan is subject to further review before any further action is taken.

Motion: moved by Deputy Mayor Mosher, seconded by Councillor Sanford to adopt the Comprehensive Community Plan (Schedule "C"). Motion carried.

Motion: moved by Councillor Halverson, seconded by Councillor Birtles to establish that the Comprehensive Community Plan is the current strategic plan of the Town of Lunenburg. And further, the 35 actions items identified in the Comprehensive Community Plan, section 12.11 "Implementation and Monitoring" are the actions to be implemented focusing on these priorities for the first five years (Schedule "C"). Motion carried.

Motion: moved by Councillor Birtles, seconded by Deputy Mayor Mosher that the Comprehensive Community Plan (Schedule "C") is recognized as the Town's current strategic plan which shall supersede and replace the previously completed Town strategic plan. Motion carried.

Motion: moved by Councillor Duggan, seconded by Councillor Ernst that the first quarterly progress report to Council regarding the Comprehensive Community Plan (Schedule "C") is due March 2021. Following which, additional quarterly reports will be prepared. Motion carried.

10. Adjournment

The meeting was adjourned at 6:11 p.m. by the Mayor.

_____

Bea Renton, CAO

STEVENS SOLUTIONS & DESIGN INC.

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Canadian News

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Eastern Canada braces for the worst as Ottawa declares a state of emergency due to flooding

THE CANADIAN PRESS
PUBLISHED APRIL 25, 2019
UPDATED APRIL 26, 2019
0 COMMENTS

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Canada

Alberta floods: How Canadians can help

2013 4:15 PM ET | Last Updated: June 25, 2013

CNN World » Africa | Americas | Asia | Australia | China | Europe | Middle East | India | UK Live TV U.S. Edition +

Extreme Weather

Major flooding in Canada

Updated 12:23 PM ET, Tue May 9, 2017

The Guardian

A SaltWire Network Publication

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Focus on opening doors drives immigration aid groups

Rising sea level will 'hammer the hell' out of P.E.I., says Suzuki

Mitch MacDonald mitchellmacdonald@theguardianpe.ca
Published: Nov 25, 2015 at midnight
Updated: Sep 30, 2017 at 2:44 a.m.

Emergency planning a priority for new HRM division chief

Francis Campbell (fcampbell@herald.ca)
Published: Oct 12, 2018 at 5 a.m.
Updated: Jan 24 at 1:32 p.m.

ENVIRONMENT April 29, 2019 1:06 pm Updated: April 29, 20

First Nations leaders call for action as Kashechewan grapples with annual flooding

World News

CNN

US » Crime + Justice | Energy + Environment | Extreme Weather | Space + Science

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Recent flooding has affected at least 1,000 homes in Oklahoma

By Jason Hanna and Joe Sutton, CNN

Updated 5:14 PM ET, Fri May 24, 2019

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Science & Environment

Climate change: Global sea level rise could be bigger than expected

By Matt McGrath

Environment correspondent

20 May 2019

China floods: Dozens killed, more than a million evacuated

Heavy rainfa
of southern

The Yangtze
overflowed,
and forcing

05 Jul 201

The Guardian

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Climate change is increasing flood risks in Europe

A new study finds strong agreement that flood risks in central and western Europe are rising due to global warming.

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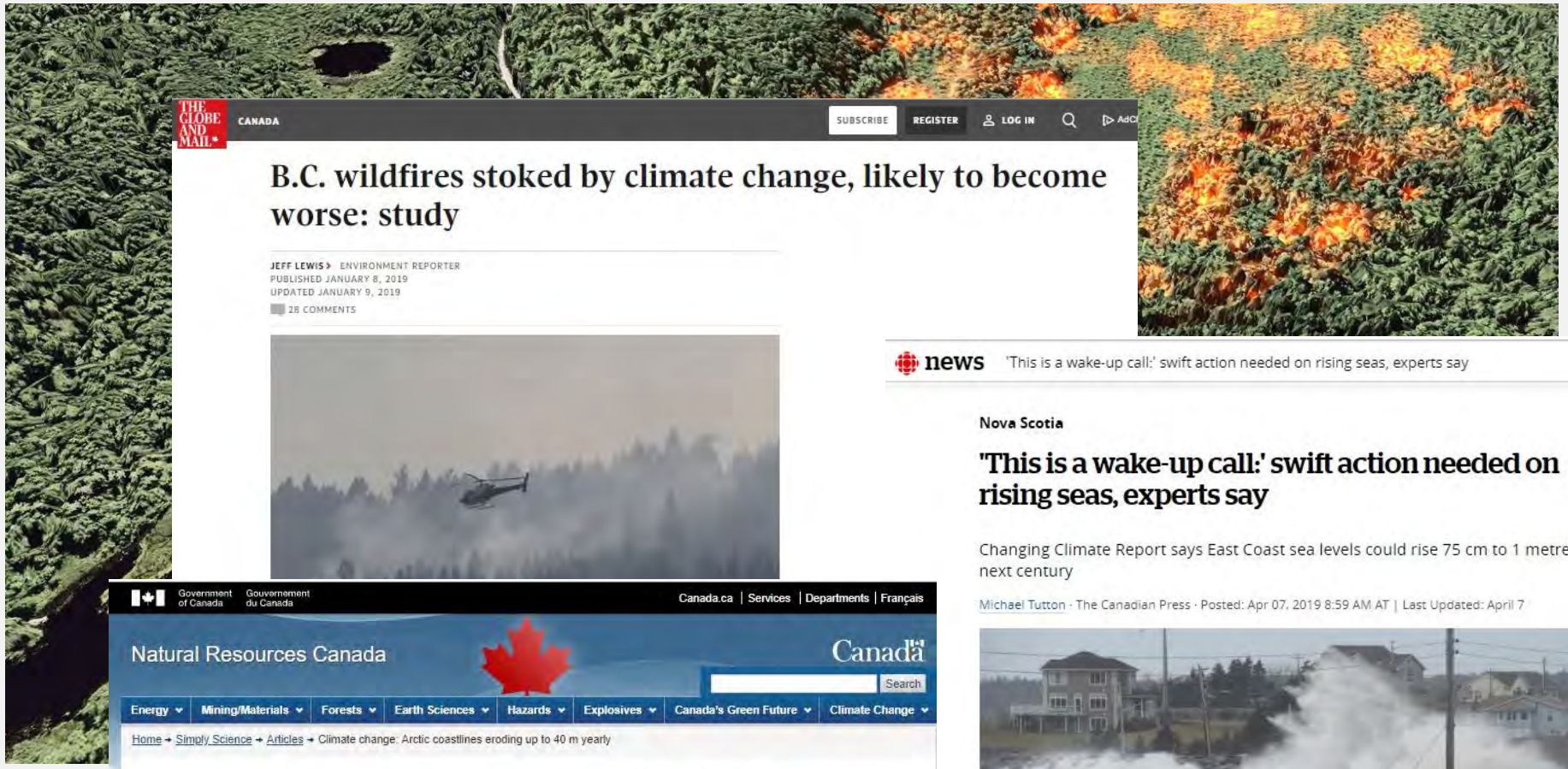
Cyclone, flooding cause widespread damage across Southern Africa

Death toll rises to 215 as the cyclone tore through Malawi into central Mozambique before hitting Zimbabwe.

19 MAR 2019

Climate Change: Hearing but not Understanding

- Wild Fires
- Fluvial Flooding
- Sea Level Rise
- Storm Surge
- Coastal Erosion



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B.C. wildfires stoked by climate change, likely to become worse: study

JEFF LEWIS › ENVIRONMENT REPORTER
PUBLISHED JANUARY 8, 2019
UPDATED JANUARY 9, 2019
28 COMMENTS

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Natural Resources Canada — Canada

Energy | Mining/Materials | Forests | Earth Sciences | Hazards | Explosives | Canada's Green Future | Climate Change

Home → Simply Science → Articles → Climate change: Arctic coastlines eroding up to 40 m yearly

Climate change: Arctic coastlines eroding up to 40 m yearly

Arctic | Climate change | Geoscience

By Joe McKendy
February 28, 2018

Talk of climate change impact often focuses on the future — 10, 20 or 50 years ahead. But in the Arctic, the erosion of coastline can sometimes be measured *from one day to another.*

"When you go to Canadian Arctic, in particular the Beaufort Sea, we see changes in a summer, in a month, sometimes even in a day, during coastal storms" says Dustin Whalen of Natural Resources Canada. He estimates that 30 to 40 m of coastline can be lost to the sea each year.

news 'This is a wake-up call:' swift action needed on rising seas, experts say

Nova Scotia

'This is a wake-up call:' swift action needed on rising seas, experts say

Changing Climate Report says East Coast sea levels could rise 75 cm to 1 metre in next century

Michael Tutton · The Canadian Press · Posted: Apr 07, 2019 8:59 AM AT | Last Updated: April 7

Research, Development and Implementation

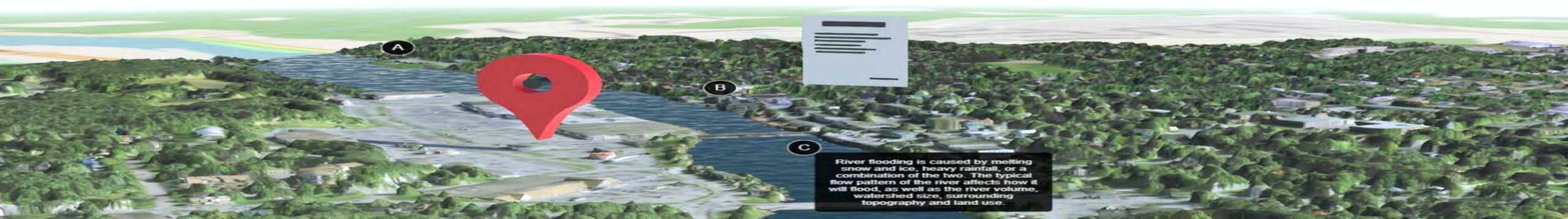
R&D, in conjunction and with the support of the following organizations:

- National Research Council of Canada (NRC)
- Natural Sciences and Engineering Research Council of Canada (NSERC)
- NSCC's Applied Geomatics Research Group (AGRG)
- Atlantic Canada Opportunities Agency (ACOA)
- Others

Customers and Pilot Projects:

- Indigenous Services Canada (EMAP)
- Rural Innovation District (NSERC)
- One Sky International (AGRG)
- Paqtnkek First Nation (AFF)
- Others

Acadia First Nation, Medway, Ponhook and Wildcat Reserves
Town of Mahone Bay, Town of Lunenburg
Maliseet Nation Conservation Council (NB)



Solutions: Seeing is Believing

Efficient LiDAR Processing

1. Quick and efficient processing of LiDAR (Laser-Light Detection and Ranging) Hydrodynamic data
2. Image data that can be used to create photorealistic 3D map/event visualizations
3. Greatly reduced file sizes.

Communicating in 3D

1. Web-based and accessible through multiple platforms
2. Interactive 3D realism
3. Clear, engaging & user friendly
4. Communications tool for wide spread dissemination

Accessible Planning Tools

1. 3D visualisations for emergency preparedness training purposes throughout the region.
2. Increased public awareness
3. Accessible communication tool for the public and decision makers

Personal Digital Experience

Improving the Communication of Climate Data

- Developed using LiDAR data (Laser-Light Detection and Ranging) and digital elevation models (DEM)
- Clear & Engaging Content
- Optimized for Mobile, Tablet and Desktop
- User-Friendly Platform
- Interactive

Product Overview Video

- Visualization in Action: https://vimeo.com/385988130/aaef90c729

Interactive Real-World Demos

- Lunenburg SLR: https://3dwavedesign.com/Lunenburg-CBCL/version-1-0-7/
- Medway Reserve Fire/Flood: https://3dwavedesign.com/acadia-medway/version-1-0-5/
- Wildcat Reserve Fire/Flood: https://3dwavedesign.com/acadia-wildcat/version-1-0-5/

In the News

Software helps communities see how climate change could impact them | CBC News

https://www.cbc.ca/news/indigenous/mikmaq-software-climate-change-floods-wildfire-3d-models-1.5482571

Company offers up 3D technology for Mahone Bay

Modelling would help anticipate future flood events in the town

By KEVIN MCBAIN
kevin.mcbain@lighthousenow.ca
@KMcBainLHNOW

The Town of Mahone Bay hopes to stem the rising tide of climate change-caused severe weather and associated flooding with a new 3D modelling tool.

Stevens Solution & Design based in Mahone Bay have come up with a program that will help in this process. The company is owned by Barry Stevens, who works with his son Noah and his wife Leena. The trio presented at the April 9 Mahone Bay town council meeting.

Working with lidar data (a 3D modelling process) and satellite imagery, the company can produce a 3D model of the area and show what could happen in 25, 50, or even 100 years if the severe weather and rise of water continues.

"You folks have called a climate emergency and we think that this is real," Barry told council. "We want to undertake a project for Mahone Bay that will enable the town to see exactly what they will need to do to prevent damage in the future."

He said that they have been working with the NSCC Applied Geomatics Research Group and they have developed their own intellectual property that would take lidar data, satellite imagery, hydrodynamic analysis and create 3D models.

They have received funding from the NSCC Rural Innovation fund to tackle the project in Mahone Bay and say the cost to the town will be nominal.

Mayor David Devenne and council have directed town staff to work with the Stevens on the project and Devenne said that this will be a great tool to have.

During the presentation, Noah showed an example of their work with the LaHave River running through Bridgewater, as an example. He demonstrated the water rise and forecast how in 100 years the water would spill over the banks and basically cover the South Shore mall's parking lot if nothing is done to mitigate the problem.

He said not only can they make models in the flood scenario, but this can be used for fire scenarios, coastal erosion and other emergency events as well.

The 3D imagery can also be viewed as a web page.

"The issues with 2D maps is that you don't get any sense of space or context of depth," said Barry. "But a 3D tool give you a sense of how much the water is rising and what houses are being affected by that. This is really new, on the edge of technology. It's like a space race to get this on the web. We are really happy with what we are doing."

Stevens Solutions & Design have been in business for more than 20 years, largely working with the federal government in the areas of defence and security.

They have also worked with companies such as GN Thermoforming and Stelia Aerospace in producing 3D computer models to help visualize components and how they work.

Stevens hopes council will provide support for his company to create the emergency management tool that can be used for future planning and or land use. He also asked if they could meet with the fire chief, councillors and others that may be involved in emergency management to help them formulate what they want to see.

The company has been putting this new technology to work with pilot projects, and recently worked with the One Sky International Consulting firm where they helped plan three First Nations Communities in New Brunswick along the St. John River. They are also working with Indigenous and Northern Affairs Canada to work on an emergency planning management tool for the Wild Cat First Nation.

Testimonials

> [The] use of high-resolution LiDAR data, scientifically accurate hydrodynamic model results, and easily digestible contextual information makes their product both unique and informative.
>
> We anticipate it being an invaluable tool for allowing planners and the public to visualize risk based on actual climate change information for river and coastal communities.

NSCC AGRG Team Lead, Dr. Tim Webster, 2018

> "Recently One Sky International engaged Stevens Solutions & Design Inc (SS&DI) for a complex project involving climate change adaptation and mitigation modelling. SS&DI provided an exceptional product and client service delivery experience. On time, on budget, and exemplary quality.
>
> ...We would not hesitate to recommend them for any project; they will exceed expectations.

Robert Bernard, One Sky International, OSI

STEVENS SOLUTIONS & DESIGN INC.

Thank You

3D WAVE DESIGN
Mapping Solutions

Climate Change
Observe. Plan. Adapt.

https://3dwavedesign.com/Lunenburg-CBCL/version-1-0-7/

Town of Lunenburg Wastewater Treatment Plant Flood Assessment

Final Report

CBCL

201155.00 • October 2020

	Final Report	V. Leys	14/10/2020	D. Kolijn
	Draft Report	V. Leys A. Wilson	29/07/2020	D. Kolijn G. Waugh
Issue or Revision		**Reviewed By:**	**Date**	**Issued By:**

Solutions today | Tomorrow IN mind
Maritime Centre, 1505 Barrington Street, Suite 901
Box 606, Halifax, NS B3J 2R7
902-421-7241 | CBCL.ca | info@CBCL.ca

October 14, 2020

Ian Tillard, P.Eng.
Town Engineer
177 Cumberland Street
PO Box 129
Lunenburg, NS B0J 2C0

Dear Mr. Tillard:

RE: Town of Lunenburg Wastewater Treatment Plan Flood Assessment

CBCL Limited is please to present the Town of Lunenburg with this brief technical report investigating the causes of extreme flooding experienced at the Town of Lunenburg waste water treatment facility during the passage of Hurricane Dorian in September 2019.

The report goes on to investigate the likelihood of such an event recurring, future flood predictions, and recommendations for immediate and long-term flood risk mitigation strategies.

We thank the Town of Lunenburg for the opportunity to collaborate on this important investigation. Please do not hesitate to contact the undersigned for any questions or comments you may have in response to the contents of this report.

Yours very truly,

CBCL Limited

Prepared by:
Danker Kolijn, P.Eng., M.Sc., M.Eng.
Group Lead, Coastal Engineering
Direct: 902-421-7241, Ext. 2586
E-Mail: dkolijn@cbcl.ca

Reviewed by:
Vincent Leys, M.Sc., P.Eng., PMP
Senior Coastal Engineering
Direct: 902-421-7241, Ext. 2508
E-Mail: vincentl@cbcl.ca

Project No: 201155.00

Contents

Chapter 1 Introduction

On September 7th, 2019 Hurricane Dorian made landfall in Nova Scotia to the northeast of the Town of Lunenburg. The Hurricane generated storm surge within the Lunenburg Front and Back harbours (Figure 1-1) and caused extensive flooding and damages at the Lunenburg waste water treatment plant (WWTP). This study was subsequently commissioned to:

- Investigate the causes of the flooding,
- Study anticipated future flood levels at the WWTP facility for the immediate and long term future (i.e. 2070), and
- Provide the Town of Lunenburg with conceptual mitigation options to prevent future flood events at the WWTP facility.

Figure 1-1: Town of Lunenburg Project Area

To generate the conceptual flood mitigation options, this brief report provides the following:

- Derivation of design water levels, including tides, storm surge and sea-level rise for both the Front and Back Harbour of Lunenburg.

- An assessment of water level differences between the Back Harbour and the Front Harbour during extreme storm event (i.e., storm surge). Specifically we will assess water levels during Hurricane Juan (2003) and Hurricane Dorian (2019).
- An assessment of water levels between the Back Harbour and salt marsh connected by two (2) culverts, adjacent to the WWTP.
- Rainfall-runoff modelling to determine contributions from overland flow.
- Flood maps to depict the extents of flooding.
- Summary of recommended mitigation options.

The report concludes with a recommended mitigation option to reduce future flood risks.

1.1 Description of the 2020 Hurricane Dorian Event

From communication with the WWTP operator, we understand that the Hurricane Dorian flood event is the worst flooding event in the history of the Lunenburg WWTP, and that to date, no significant overland and coastal flooding has occurred at the plant. To better understand these historic flood conditions at the Lunenburg WWTP, a series of photographs provided by the plant operators are assessed (Figure 1-2 and Figure 1-3).

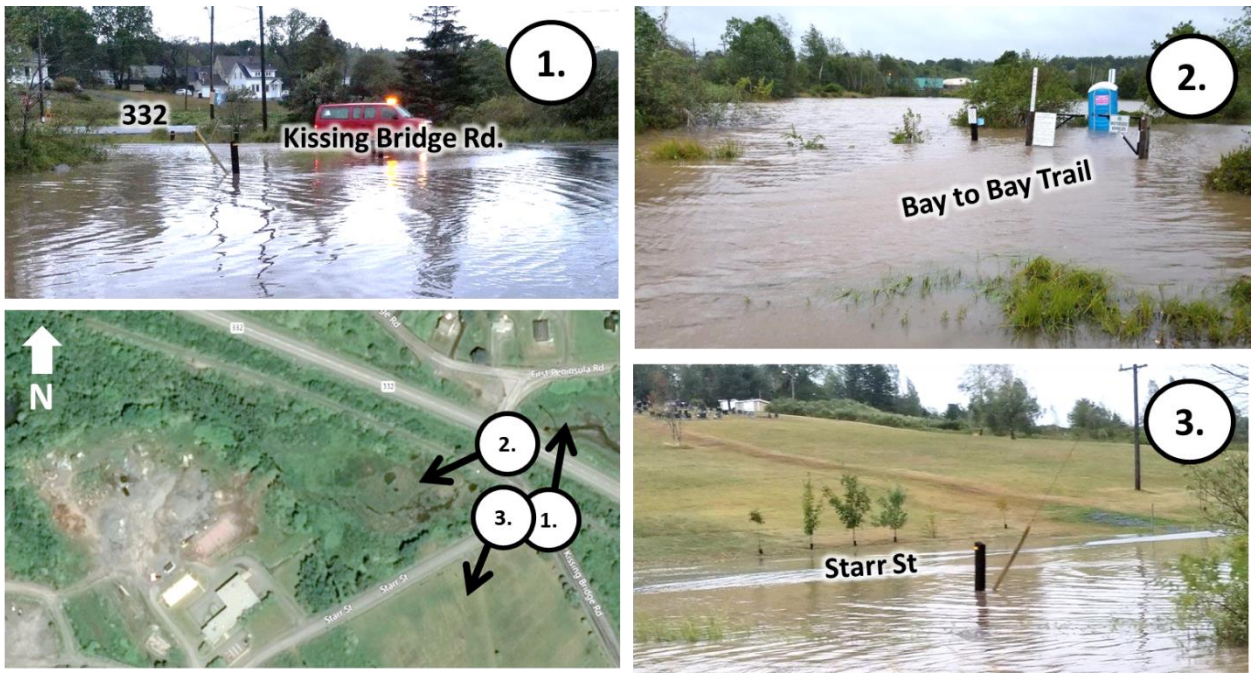


Figure 1-2: Flooding at Highway 332 on September 7th 2019

From these images we can observe the following:

- Highway 332 remains dry and is not inundated (Figure 1-2, 1). The highway sits at approx. +2.6m CVGD2018.
- The Bay to Bay Trail is flooded (Figure 1-2, 2), where the trail bed sits at approx. +1.75m CVGD. There appears to be about a foot of water on the trail.

- Starr St. is flooded (Figure 1-2, 3), which runs parallel to the plant property. The road gradually rises as it approaches the plant. At its lowest point near the intersection (depicted in (Figure 1-2, 3), the surface of the road sits at +1.9m CVGD2013.
- The bay doors of the WWTP are inundated (Figure 1-3, 3), where the floor of the WWTP sits at +1.71m CVGD2013.
- The drainage ditches at the turnoff to the WWTP on Starr St. are entirely inundated and part of the access road to the WWTP is flooded.
- The berms around the WWTP are dry.
- Flooding appears to be coming from the drainage ditches and drainage canal which leads into the salt marsh to the east of the WWTP.

Figure 1-3: Flooding at the Lunenburg WWTP on September 7th 2019

We can estimate flood levels in the plant by analyzing post-flood pictures taken inside the facility (Figure 1-4). We note the flood lines left on the inside of the building which appear to be 2-3 cinder block heights above the plant floor. We know that the floor sits at +1.71m CVGD2013, therefore given typical cinder block dimensions, a flood height of 2.11m to 2.31m CVGD 2013 is feasible. Sources of this flooding are likely a combination of several contributors which could include storm surge, land based runoff, overflow in the building, and localized pooling or ponding. The dominant sources of flooding will be explored further in this report.

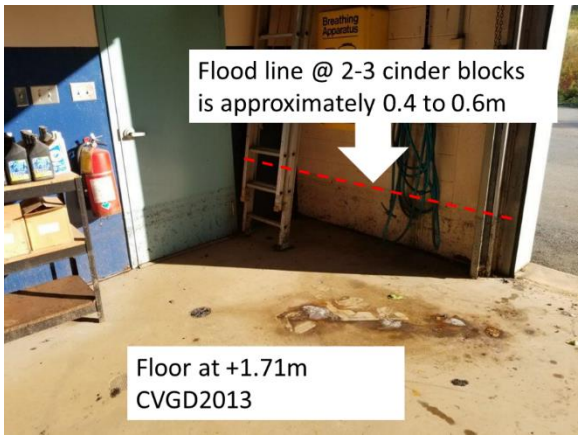


Figure 1-4: Flooding evidence inside Lunenburg WWTP

Chapter 2 Coastal Water Levels Front Harbour

2.1 Coastal Flooding Drivers

Coastal flooding is typically governed by still water levels with contributions from the following parameters:

- **Tide** – The Higher High Water Large Tide (HHWLT) is a common parameter for representing high tide. It represents the average of the annual maxima from a 19-year tidal prediction cycle.
- **Storm Surge** – Storm surges are created by meteorological effects on sea level, such as wind set-up1 and low atmospheric pressure, and can be defined as the difference between the observed water level during a storm and the predicted astronomical tide.
- **Sea-Level Rise (SLR)** – Global Mean SLR will accelerate due to climate change, causing increased risks of coastal erosion and flooding. Relative sea level rise (RSLR) represents Global Mean SLR corrected with local factors including but not limited to vertical land motion.

Wave impacts and river contributions are expected to be negligible for the project site.

2.2 Storm Surge

Regional storm surge trends can be inferred from large-scale models, and nearby tide gauge observations if available. Regional modeling of storm surge was conducted by Bernier et al (2006). Sample results shown on Figure 2-1 illustrate the large-scale spatial patterns of storm surge intensity across the region, not accounting for tides. For the present study, it is assumed that the magnitude and long-term time distribution of storm surge residual relative to the tide is comparable to that measured by the DFO long-term tide gauge at Halifax.

[1] Wind set-up refers to the increase in mean water level along the coast due to shoreward wind stresses on the water surface.

Calculated extreme still water levels were based on the extreme value analysis of the total water level peaks measured at the tide gauge after detrending for historical sea level rise. The calculated extreme total water levels were then corrected to the project site based on the HHWLT elevation difference between the tide gauge and the project site. The chosen method based on total water level peaks ensures that the N-year extreme total water level is statistically representative, accounting for the possibility that extreme storm surges do not always coincide with the highest tides.

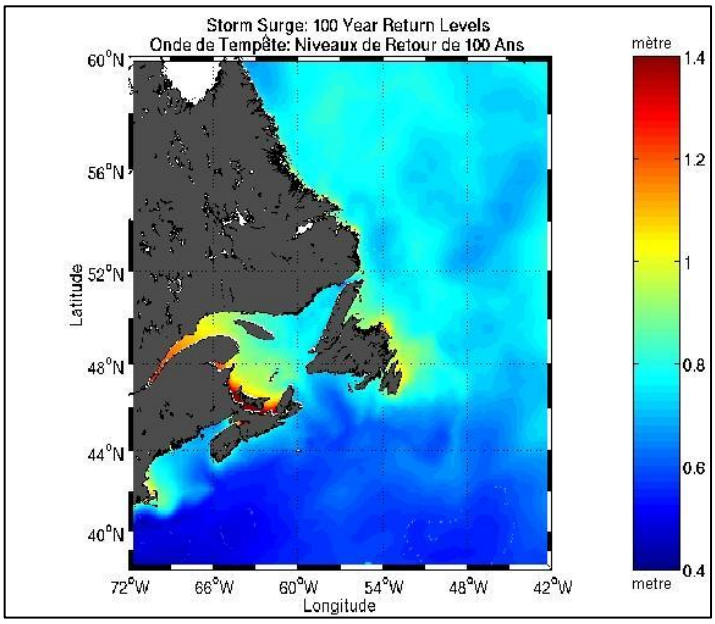


Figure 2-1: Extreme Storm Surge Residual across the Maritimes
(Source: Environment and Climate change Canada, based on

Table **1** shows the tidal and calculated total extreme still water levels for the Lunenburg Front Harbour.

Table 1: 2020 Tidal and Extreme Still Water Level Estimates for Lunenburg Front Harbour

Return Period [years]	m Chart Datum (CD)	m CGVD28	m CGVD2013
100-yr	3.3	2.1	1.5
50-yr	3.2	2.0	1.4
10-yr	3.0	1.8	1.2
5-yr	2.9	1.7	1.1
2-yr	2.8	1.6	1.0
1-yr	2.7	1.5	0.9
Tidal Elevations Source: DFO 2020 Canadian Tide and Current Tables			
Higher High Water Large Tide (HHWLT)	2.4	1.2	0.6
Higher High Water Mean Tide (HHWMT)	2.1	0.9	0.3
Mean Water Level (MWL)	1.3	0.1	-0.5
Lower Low Water Mean Tide (LLWMT)	0.7	-0.5	-1.1
Lower Low Water Large Tide (LLWLT)	0.3	-0.9	-1.5

2.2.1 Storm Surge Uncertainty

Uncertainty in the above storm surge values comes from the following factors:

1 Uncertainty in extreme value analysis on the Halifax total water levels itself. The 95% confidence interval on the 100-year return estimate is ±0.2 m.
2 Uncertainty in applying Halifax storm surge values to Lunenburg.
3 Differences between Lunenburg Harbour and Back Harbour where the WWTP is located. Due to the funneled shape of the Back Harbour bay, it is possible that water levels could be measurably higher under certain wind conditions.

Uncertainty from factors (2) and (3) could be mitigated by additional storm surge modeling. For example, the storm surge residual measured in Lunenburg Harbour during 2003's Hurricane Juan was 0.65 m (Mulligan, 2008). The water level in Back Harbour during that storm was not measured. However, it could be resolved by a high-resolution hydrodynamic model forced by regional hurricane wind fields, to be used subsequently for investigating alternative storm tracks and storm intensities.

2.3 Sea Level Rise

Sea levels have been rising in the Maritimes since the end of last ice age 10,000 years ago. The trend is expected to accelerate with climate change. SLR Projections for the area are summarized on Figure 2-2 (Greenan et al 2018, based on James et al 2014), based on scientific literature summarized in the following paragraphs.

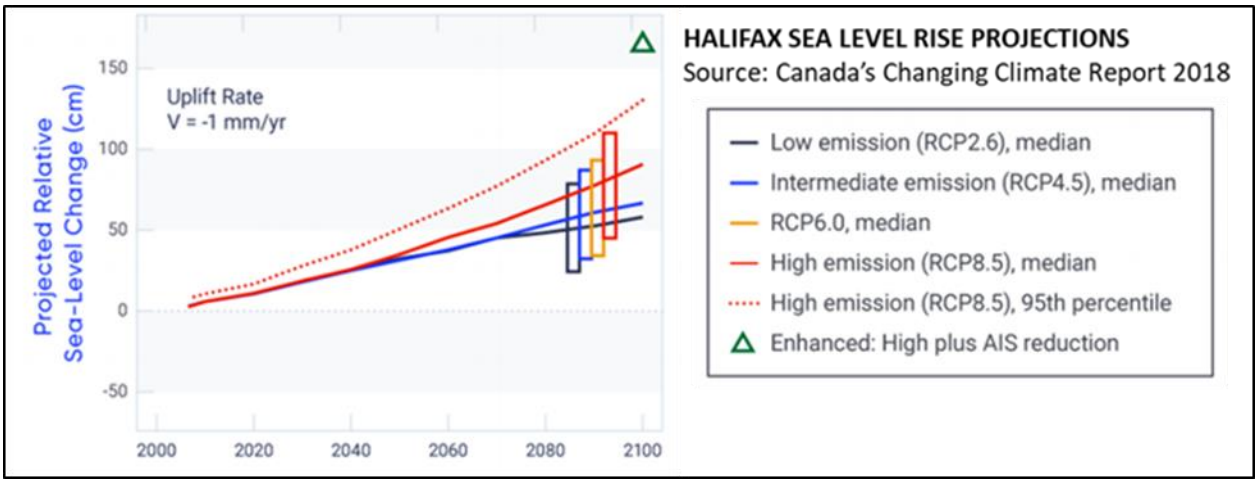


Figure 2-2: Halifax Sea Level Rise Estimates Reproduced from Greenan et al 2018
The green triangle is the projection of a scenario based on collapse of a portion of the West Antarctic Ice Sheet, providing an additional 0.65 m of Global Mean SLR to RCP8.5 by 2100.

2.3.1 Consensus Intermediate SLR Projections

The Intergovernmental Panel on Climate Change's Fifth Assessment Report (IPCC AR5 2013) estimated that the upper-bound Global Mean SLR could **be in the order of 1.0 m by year 2100**. This projection using process-based models was for Representative Concentration Pathways RCP 8.5 high-emission scenario. To derive Relative SLR, the Department of Fisheries and Oceans Canada (DFO) then developed the online Canadian Extreme Water Level Adaptation Tool (CAN-EWLAT), based on work by James et al. (2014) accounting for local

factors. CAN-EWLAT is a science-based planning tool for climate change adaptation of coastal infrastructure related to future water-level extremes, based on IPCC AR5 projections improved upon by incorporating information on land subsidence measured with high-precision GPS instruments. It was developed to provide SLR allowances for DFO harbours across Canada. Allowances are estimates of changes in the elevation of a site that would maintain the same frequency of inundation that the site has experienced historically.

2.3.2 Upper-End Projections with High Uncertainty

Recent studies tend to support higher GMSL upper-end projections based on potential rapid Greenland and West Antarctic Ice Sheet (AIS) reduction. These upper-end SLR projections (DFO Han et al. 2016, or NOAA Sweet et al. 2017) are based on probabilistic projections of the factors driving GMSL rise, which is different than the process-based model approach from IPCC AR5. NOAA's year 2100 GMSL projections range from Low (0.3m), Intermediate (1.0m), High (2.0m) and Extreme (2.5m). These projections carry higher uncertainty. Given these findings, the 2014 DFO CAN-EWLAT estimates based on IPCC AR5 RCP8.5 could be considered intermediate projections. In the Canadian context, Greenan et al. (2018) propose to add **an additional 0.65 m by 2100** of Global Mean SLR to RCP8.5.

2.3.3 Selection of Scenarios

The appropriate scenario to use depends on the application, such as planning time horizon or risk tolerance of the area and infrastructure assets. As shown on Figure 2-2, the scenarios start to significantly diverge after a few decades (2050's and beyond). The following approach using two scenarios as a general planning envelope could be considered, as per NOAA 2017.

- Define an *intermediate* SLR projection for short-term and medium-term planning. We propose that this scenario be the CAN-EWLAT estimate, which would represent an intermediate projection typically close to 1 m to the end of the century. This intermediate scenario may be used for defining the elevation of coastal protection structures and potentially roads, which could be built for a shorter design life and/or have built-in flexibility to allow incremental raising.
- Define an upper-bound scenario, which in the present case could be the *high or extreme* GMSLR projection that includes AIS reduction, and use it as a guide for overall risk and long-term adaptation strategy. The upper-bound scenario can be used for guiding the selection of minimum site elevations required for siting of future and potentially vulnerable permanent infrastructure.

Finally, the science of SLR will keep evolving with updated observations and improving model predictions. Implications for infrastructure and coastal flooding will need to be re-evaluated with periodic updates in SLR projections.

Table 2: SLR Scenarios

Relative SLR Scenario	2030	2040	2050	2060	2070	2080	2090	2100
(1) Intermediate Vertical allowance from CAN-EWLAT RCP8.5	0.13	0.2	0.31	0.42	0.55	0.7	0.87	1.12
(2) High =(1)+AIS reduction (0.65m by 2100)	0.21	0.32	0.49	0.66	0.87	1.11	1.37	1.77

2.4 Coastal Flood Risk

2.4.1 Deterministic vs. Probabilistic Approach

In infrastructure design, it has been common to use a deterministic approach to risk. This involves designing for an extreme event (e.g. 100-year return storm) for a given lifetime before refurbishment. For example, the resulting probability of encounter of the design event during a 50-year lifetime would be 39% (for the 100-year event used for design) to 64% (for the 50-year event).

In the context of climate change and particularly coastal flood risk, the deterministic approach is rendered invalid by sea level rise (SLR) because the probability of encounter of extreme events will increase with time. Therefore, we used an alternative probabilistic approach.

2.4.2 Probabilistic Coastal Flood Levels

The lifetime probabilities of coastal flooding were estimated for various elevations and SLR scenarios. The probabilistic calculation accounts for the increasing annual probability of encounter of a given coastal flood level, based on storm surge statistics and sea level rise scenarios previously described.

For various elevations and SLR scenarios,

Figure 2-3 quantifies the probability of occurrence that the coastal storm surge levels will exceed the given land elevation at least once between 2020 and the timeline specified. For example, the elevation with a 50% risk of flooding at least once between today and 2070 ranges from 1.8 (with intermediate SLR scenario) to 2.1 m CGVD2013 (with high SLR scenario), plus storm surge uncertainty levels as described in previous section. The uncertainty in SLR grows more significant towards the end of the century, hence the increasingly larger risk difference.

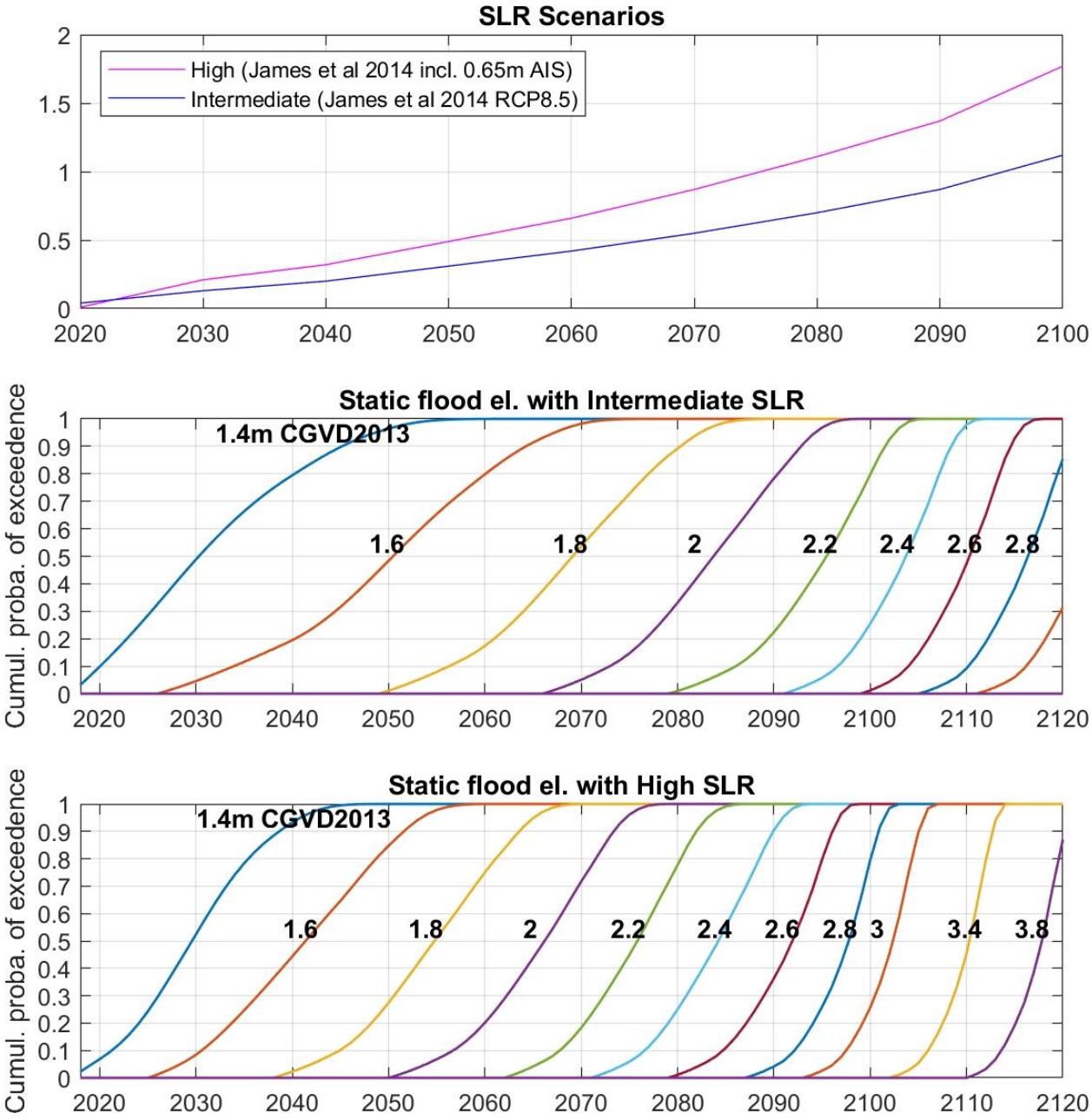


Figure 2-3: Probabilistic Water Level Estimates in Metres CGVD2013 for Front Harbour

This Figure is a decision tool to select the appropriate infrastructure elevation based on risk tolerance. The risk tolerance is defined by infrastructure lifetime and acceptable probability of flooding over the given lifetime. For a given project site, risk tolerance typically depends on the type of asset being designed or refurbished.

Chapter 3 Water Level Measurements

A series of culverts connects the Back Harbour to a marsh which is situated adjacent to the WWTP. Highway 312 acts as a barrier between the Back Harbour and the parcel of land on which the WWTP has been built. The highway has a crest elevation of +2.6m CGVD2013, which is above the anticipated extreme water levels expected at the site. Therefore, the only viable connection between Back Harbour and the WWTP property is a through the culvert system. To determine the connectivity between the Back Harbour and the marsh, CBCL Limited (CBCL) installed two (2) tide gauges for a period of 14 days to better understand the hydraulic interaction between these connected water bodies. The location of the sensors is depicted in
Figure 3-1, and the 14-day time series of water levels relative to CGVD is depicted in
Figure 3-2.

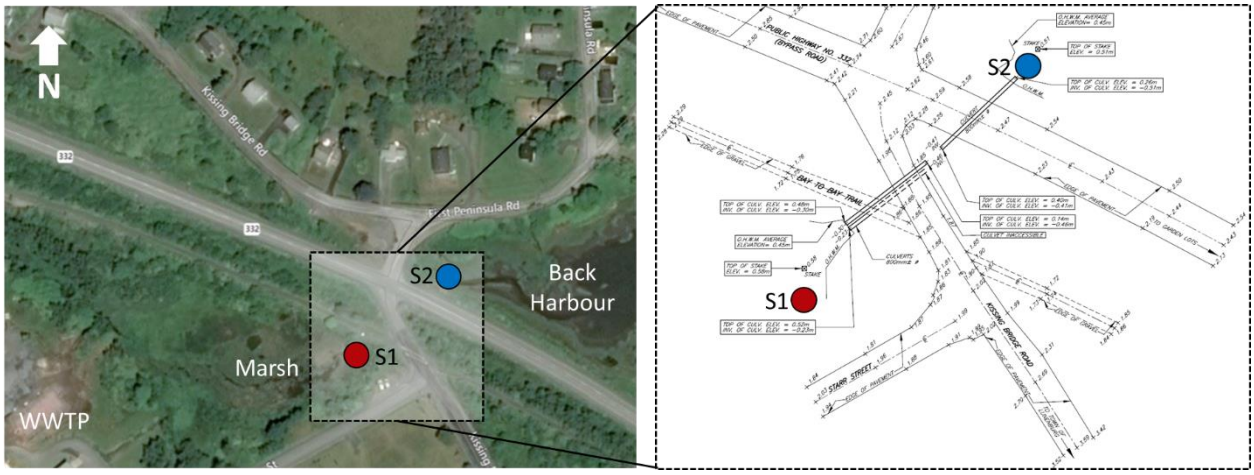


Figure 3-1: Location of Water Level Sensors between the Back Harbour & Marsh

A survey was completed in April 2020 of the culverts (
Figure 3-1, right) to determine their dimensions and elevation relative to the water levels in Back Harbour. The position of the water level gauges was also surveyed, where the water level sensor in the Back Harbour was installed at -0.93m CGVD2013, and the sensor in the marsh was installed at -0.19m CGVD2013. From the time series in
Figure 3-2, we can make the following conclusions:

- Maximum water levels in the marsh are similar to those reported in the Back Harbour, suggesting a near synchronized hydraulic connectivity between the marsh and Back Harbour.

- Results suggest that it is likely that during a storm surge, the water levels in the marsh will be at least as high as water levels in the Back Harbour, with an almost simultaneous response (i.e. timing) of water levels in marsh, relative to the Back Harbour.
- Recorded water levels in the marsh are slightly lower than those observed in the Back Harbour. This difference is almost negligible and may be attributed to various positional or sensor errors.
- Water levels in the marsh are well below the floor of the WWTP (+1.71m CGVD2013), as is expected during a typical 14-day tidal cycle without storm surge activity.

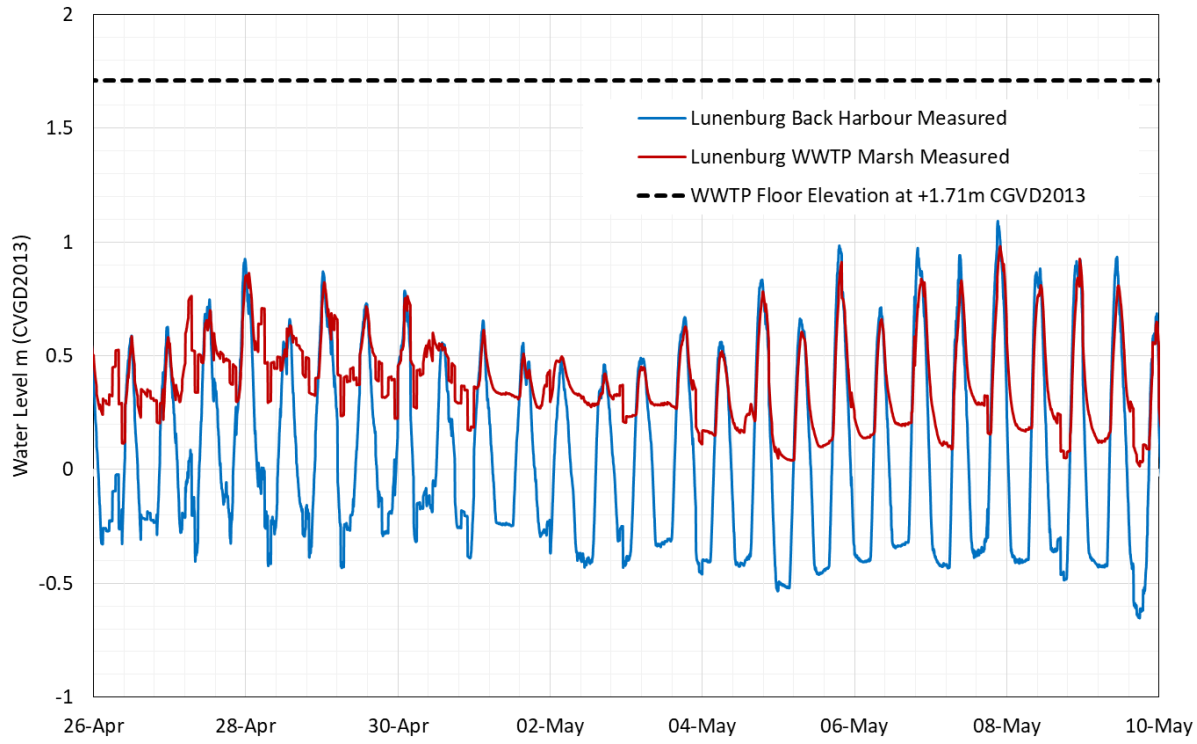


Figure 3-2: Monitored Water Levels at Lunenburg Back Harbour & Marsh

Chapter 4 Front & Back Harbour Surge

It has long been reported and observed that water levels in the Lunenburg Front and Back harbours can differ during storm surge events. To better understand storm surge dynamics between the Front and Back Harbour, CBCL used the industry-standard MIKE21[2] coupled hydrodynamic and wave model available from the Danish Hydraulic Institute (DHI). The storm surge model was calibrated to a known event, i.e. Hurricane Juan on 29 September 2003. This event generated the record high water level observed by the Halifax tide gauge (2.9 m Chart Datum total water level) and in Lunenburg front Harbour (a 0.65m storm surge residual as reported by Mulligan et al., 2008).

Hurricane track, wind and atmospheric pressure data were input into the model to simulate the storm surge. The Hurricane model extends across the entire Maritime region and is refined at Lunenburg to capture the local storm surge effects. The paths used in the regional Hurricane model are depicted in Figure 4-1. The model is forced by a directional wind and pressure field generated by the hurricane track, with inputs of time, location (lat. & lon.), wind speed, pressure, and a radius of maximum wind parameter.

[2] DHI (Danish Hydraulic Institute) 2020 Version Release Mike21 Modelling Package

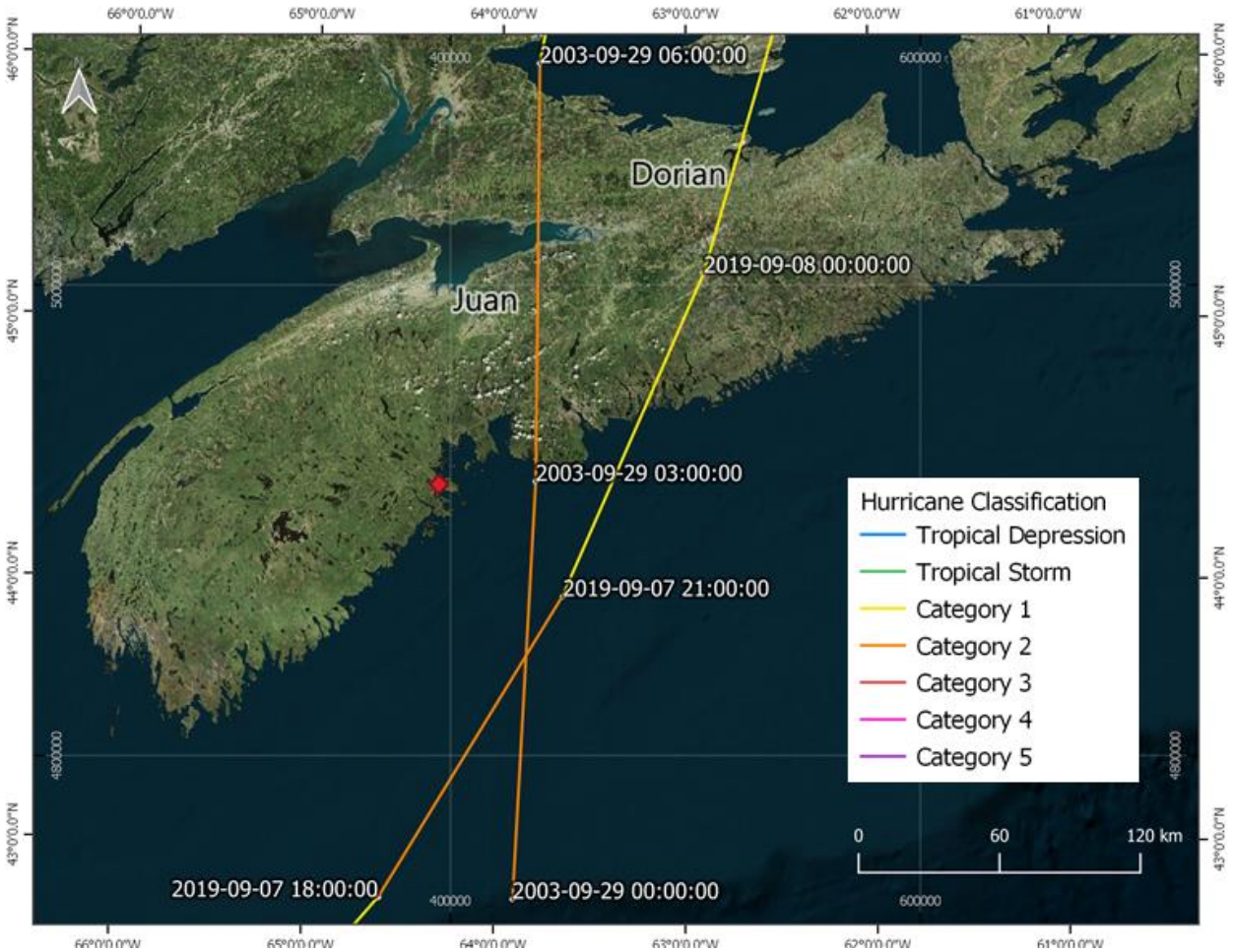


Figure 4-1: Hurricane Tracks Used in the Regional Hurricane Model

The modelled peak storm surge residual (i.e. above astronomical tide) at the Halifax tide gauge was 1.5 to 1.6 m, which is consistent with the tide gauge record of a 1.5 m peak for this event. The modelled peak storm surge residual (i.e. above astronomical tide) for the Lunenburg Front harbour was 0.67m (Table 3), which is consistent with the recorded peak of 0.65m (excluding wave run-up).

Model results from the storm surge model (Figure 4-2), indicate a difference between Back and Front Harbour storm surge residual elevations (excluding tide) during Hurricane Juan (2003) and Hurricane Dorian (2019). A summary of these differences is provided in Table 3, which indicates a 25%-27% greater water level in the Back Harbour relative to the Front Harbour.

Table 3: Storm Surge Residual Values at Lunenburg Back & Front Harbour

Event	Simulated Storm Surge Residual (m)		
	Front Harbour	Back Harbour	Difference
Hurricane Juan (2003)	0.67	0.89	0.22 (+25%)
Hurricane Dorian (2019)	0.80	1.10	0.30 (+27%)

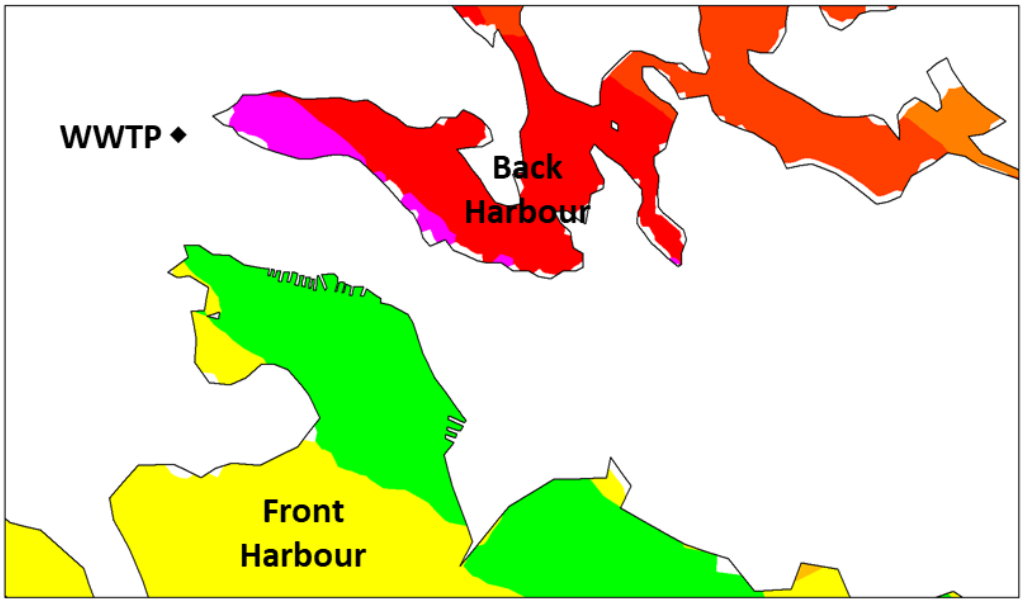
Using the tidal assessment in the preceding section, a summary of extreme water levels which adds the HHWLT to the storm surge residual, for each Hurricane system is provided in Table 4, for all three relevant vertical reference systems.

Table 4: Extreme Water Levels at Lunenburg Back & Front Harbour

Hurricane Event	Extreme Water Levels					
	m Chart Datum		m CGVD28		m CGVD2013	
	Front Harbour	Back Harbour	Front Harbour	Back Harbour	Front Harbour	Back Harbour
Hurricane Juan (2003)	3.07	3.29	1.87	2.09	1.27	1.49
Hurricane Dorian (2019)	3.20	3.50	2.00	2.30	1.40	1.70

From the storm surge analysis completed for Hurricane Juan and Dorian, we can derive an estimate for 2020 tidal and extreme still water levels for both Lunenburg Front & Back Harbour. Based on the limited sample size analyzed, the variation of extreme still water levels for Front & Back harbour is presented in Table 5.

Hurricane Dorian (2019)



Hurricane Juan (2003)

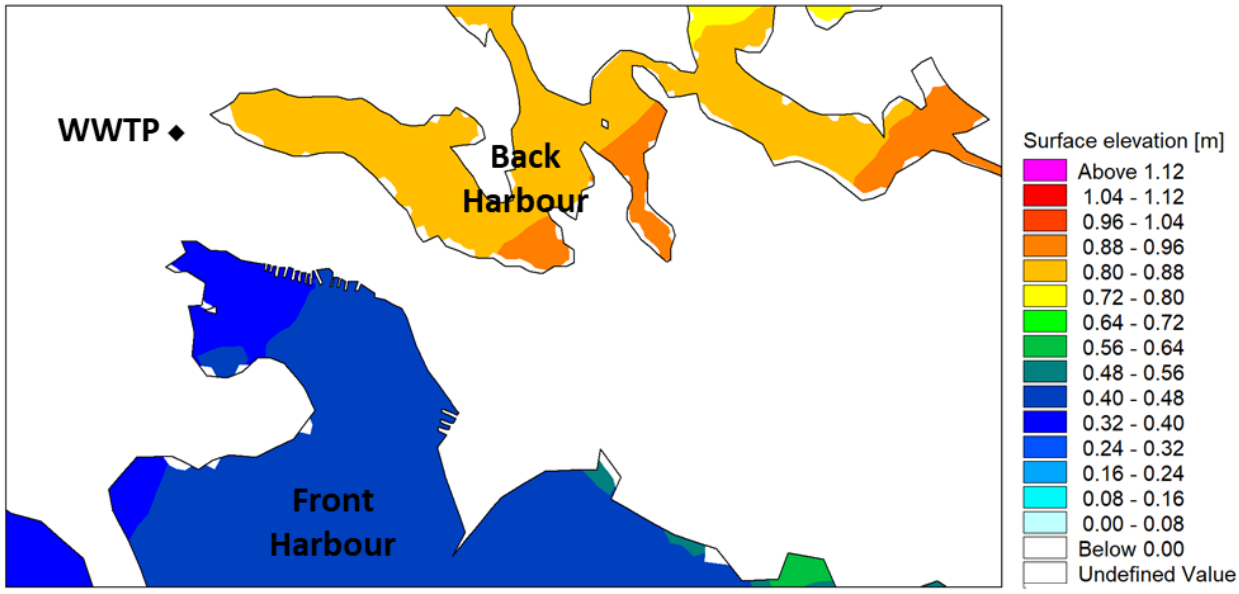


Figure 4-2: Modelled Storm Surge Residual Only, Excluding Tide, in Metres CGVD28

Table 5: 2020 Tidal and Extreme Still Water Level Estimates for Front & Back Harbour Based on long-term storm surge statistics from the Halifax tide gauge corrected for local tide (Front Harbour), complemented by numerical modeling correction for Back Harbour based on Hurricane Juan and Hurricane Dorian simulations.

Return Period	Lunenburg Front Harbour			Lunenburg Back Harbour		
	m Chart Datum (CD)	m CGVD28	m CGVD2013	m Chart Datum (CD)	m CGVD28	m CGVD2013
100-yr	3.30	2.10	1.50	3.53	2.33	1.73
50-yr	3.20	2.00	1.40	3.41	2.21	1.61
10-yr	3.00	1.80	1.20	3.16	1.96	1.36
5-yr	2.90	1.70	1.10	3.03	1.83	1.23
2-yr	2.80	1.60	1.00	2.90	1.70	1.10
1-yr	2.70	1.50	0.90	2.78	1.58	0.98

Table 6: Using the sea level rise projections (low and high), we can develop a range of anticipated flood levels in front and back harbour. For illustrative purposes these are provided below.

Return Period	SLR Scenario	Front Harbour	Back Harbour
50-yr	2020	+ 1.4m	+ 1.6m
100-yr	2020	+ 1.5m	+ 1.7m
50-yr	2070	+ 2.0m to + 2.3m	+ 2.2m to + 2.5m
100-yr	2070	+ 2.1m to + 2.4m	+ 2.3m to + 2.6m
50% prob. Of exceedance	2070	+ 1.8m to + 2.1m	+ 2.0m to + 2.5m
50-yr	2100	+ 2.5m to + 3.2m	+ 2.7m to + 3.4m
100-yr	2100	+ 2.6m to + 3.3m	+ 2.9m to + 3.5m
50% prob. Of exceedance	2100	+ 2.3m to + 2.9m	+ 2.3m to + 3.1m

* All elevations in CVGD2013

From Table 5 we can derive that Hurricane Juan (2003) generated conditions in-line with a 10-year return period storm, and Hurricane Dorian (2019) generated conditions in-line with a 100-year return period storm.

4.1 Hurricane Landfall Sensitivity Test

Two additional hurricane scenarios were modelled based on a shifted hurricane path for both Juan (0.79 °W) and Dorian (1.56 °W) to generate results of a direct Hurricane impact. The adjusted hurricane paths placed the eye of the storm just to the west of Lunenburg, resulting in a 'worse-case' scenario for each storm if the storm surge had been maximized at Lunenburg. A snap-shot from the Hurricane model for offshore wave conditions is presented in Figure 4-3, which indicates the offshore wave heights experienced for Dorian (left) and the offshore wave heights which would have been occurred had Dorian made landfall further west near Lunenburg (right).

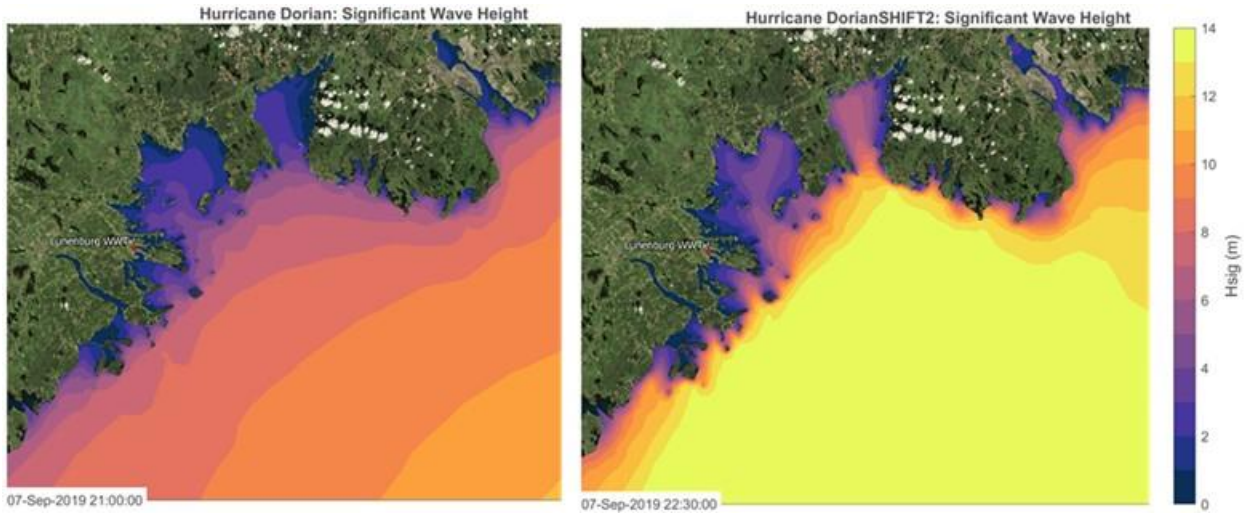


Figure 4-3: **Output of Offshore Waves for Hurricane Dorian (Left) and Shifted Hurricane Dorian Conditions (Right)**

For the shifted hurricane tracks, results were assessed for the same locations in the Luneburg Front and Back Harbours and are summarized in Table 7. A time series plot of these conditions is also presented in Figure 4-4, where the dashed lines indicate storm surge residuals in the Front Harbour, and solid lines indicate storm surge residuals in the Back Harbour.

Table 7: Storm Surge Residual Values at Lunenburg Back & Front Harbour for Shifted Hurricane Track (Direct Hit)

Event	Simulated Storm Surge Residual (m)		
	Front Harbour	Back Harbour	Difference
Hurricane Juan (2003)	0.67	0.89	0.22 (+ 25%)
Shifted (0.79°W) Hurricane Juan (2003)	1.18	1.25	0.07 (+ 6%)
Hurricane Dorian (2019)	0.80	1.10	0.30 (+ 27%)
Shifted (1.56°W) Hurricane Dorian (2019)	1.25	1.25	0.00 (+ 0%)

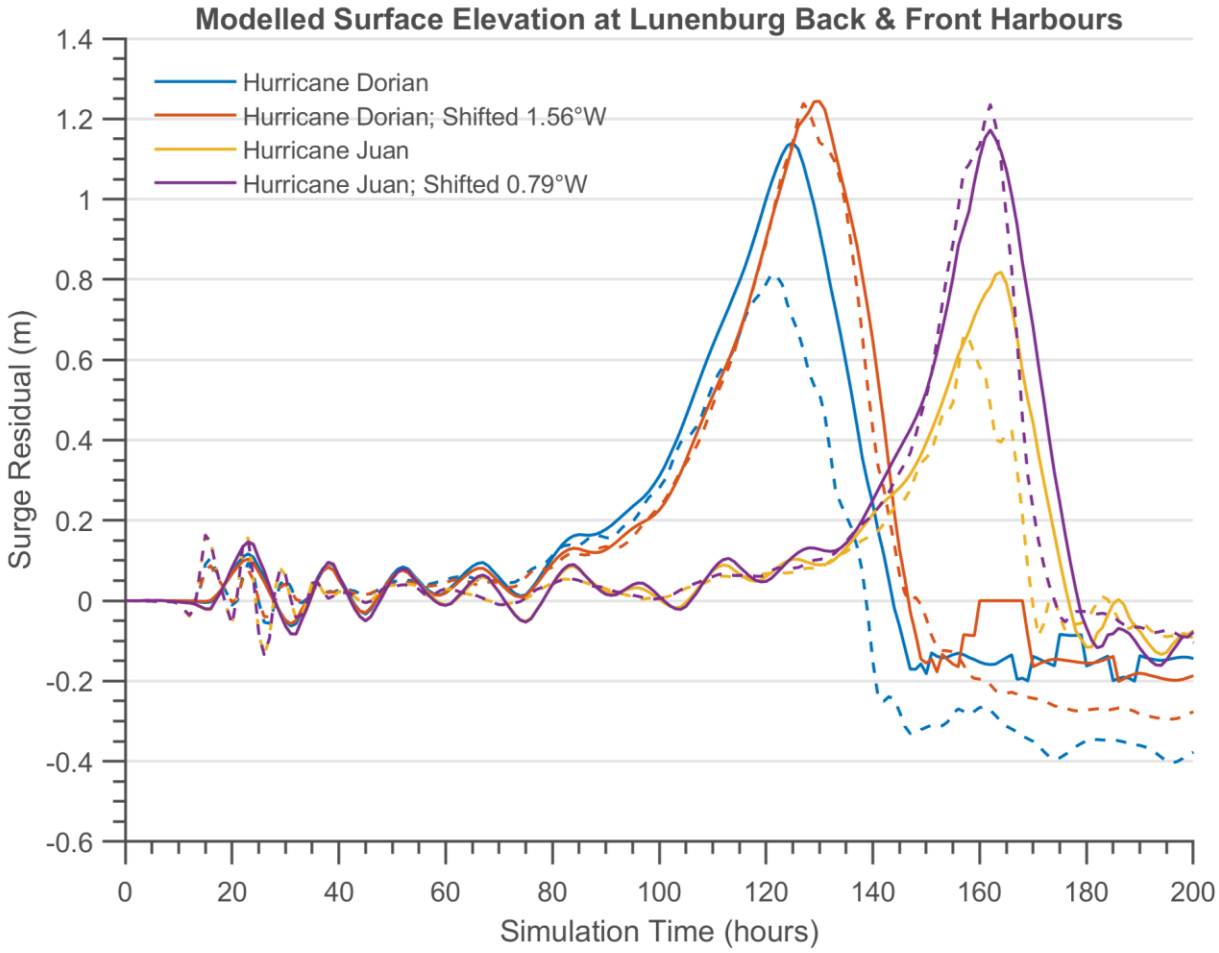


Figure 4-4: **Modelled Storm Surge Residual Only, Excluding Tide, in Metres CGVD28. Dashed Lines Indicate Water Levels in the Front Harbour and Solid Lines Indicated Water Levels in the Back Harbour**

Several noteworthy observations can be made from both Table 7 and Figure 4-5, this includes:

- For a direct Hurricane hit on Lunenburg, the storm surge residual in the Back Harbour and the Front Harbour are nearly identical. This is most likely due to a combination of the dynamic Hurricane wind direction, wind speeds, and orientation of both Harbours. When shifted, the dynamic Hurricane systems passing just west of Lunenburg for the worst case (direct hit), generates a larger and more uniform surge in both Harbours, due to the counter-clockwise wind direction of the Hurricane as observed in Figure 4-5. This phenomena illustrates the event specific impacts which Hurricanes have, and the important role that trajectories and wind characteristics play in generating localized storm surge during Hurricane events.
- The storm surge residuals for Hurricane Juan and Dorian are very similar when the tracks are shifted closer to Lunenburg. This is expected, as both Hurricanes had relatively similar magnitudes in the context of the Hurricane Scale (1-5), and their impacts at locations of landfall were comparable.

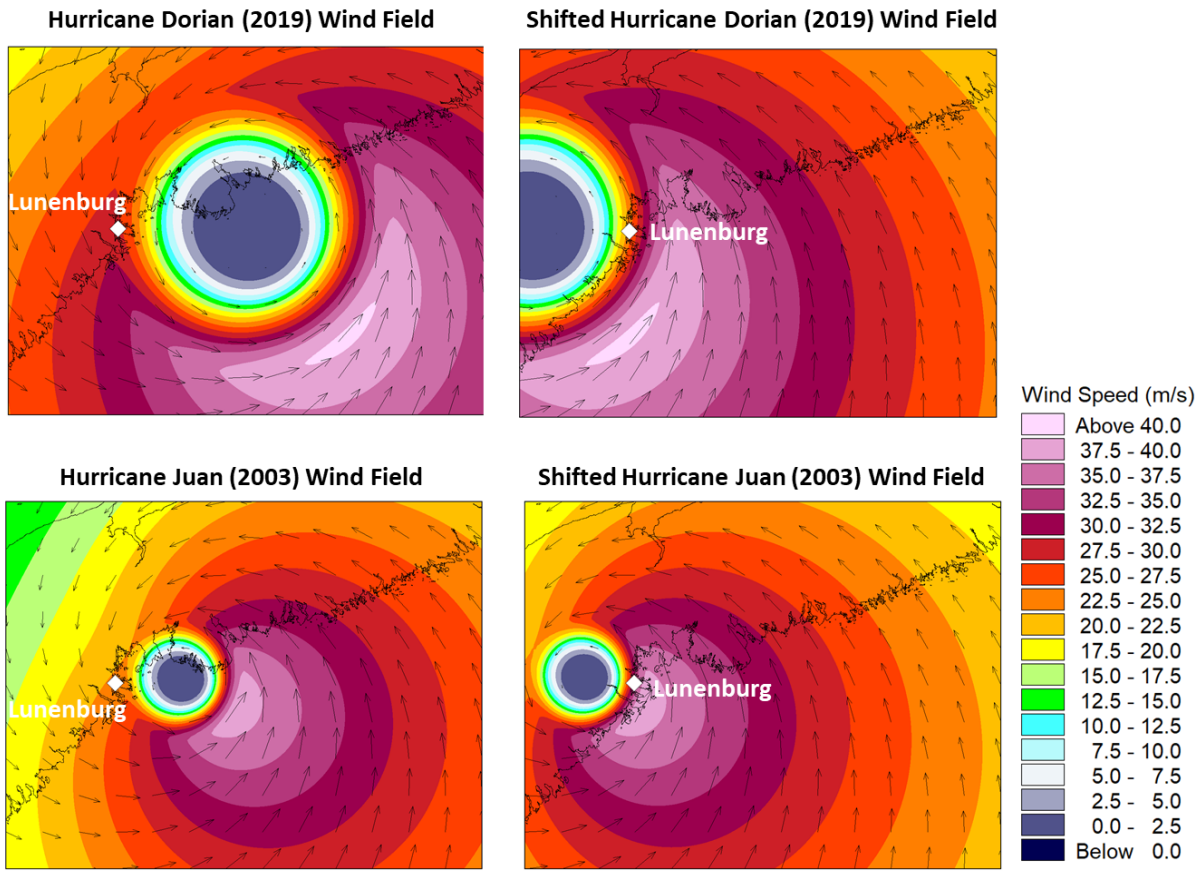


Figure 4-5: **Hurricane Model Wind Field for Dorian (Top-Left: Original-track, Top-right: Shifted Track) and Juan (Bottom-left: Original-track, Bottom-right: Shifted Track)**

4.2 Storm Surge Modelling Conclusions

Given the conclusion that the Back Harbour and the marsh next to the WWTP have synchronized water levels, and that the WWTP plant floor sits at +1.71m CGVD2013, the numerical modelling of water levels in Back Harbour (+1.7m CGVD2013) supports that the WWTP floor was inundated during Hurricane Dorian (2019). This suggests that the numerical model adequately captured the differences between storm surge in the Front Harbour and the Back Harbour, and that conditions simulated in the model at the WWTP are representative of what occurred during Hurricane Dorian.

In light of this sensitivity analysis, we conclude that the water levels (storm surge residuals) derived with the calibration of Hurricane Juan and Dorian are likely conservative when used in deriving design water levels.

The numerical models indicate that a direct Hurricane hit on Lunenburg will likely not produce the water level difference between Front and Back Harbour that was observed with Juan and Dorian (which made landfall further east).

We therefore conclude that the water level difference between Front and Back harbour used when assessing flood risk at the WWTP is a conservative scenario. It should be noted, that a direct hit from a Category 2 Hurricane in Lunenburg would exceed a 100-yr return period, and should therefore be considered separately when assessing risk and selecting a design event. Moving forward in this assessment we consider scenarios where flood levels in Lunenburg back and front harbours are identical.

Photographic evidence suggests that flooding occurred some level above the plant floor during the event (0.3 to 0.6m), which is not captured by the model. There are likely several reasons why the model has not captured this additional 0.3 to 0.6m of flooding, including but not limited to:

- Model error and data availability. All numerical models carry inherent uncertainties and ranges of error. With a hurricane surge model, an additional 0.3 to 0.6m of surge may be difficult to capture given the highly site specific nature of the WWTP, and the limited information which was available to feed into the model. The accuracy of the model is satisfactory for this type of analysis, given the results which were calibrated to anecdotal observations without measurements of water levels during the event.
- Accumulation of water in facility (surcharge / overflows). It is possible there was a surcharge of water in the facility or entrapment of water in the facility not captured by the model and contributing in part, or wholly, to the elevated water levels experienced inside the WWTP.
- Localized hydrology on the small watershed parcel of the WWTP is not captured in the model and may have to some small degree, contributed to water accumulation in the vicinity of the plant, and/or surcharge in the swamp.

In an attempt to resolve the additional 0.3-0.6 meter flood level experienced, we conduct a rainfall-runoff modelling exercise in the next chapter.

Chapter 5 Rainfall-Runoff Modelling

Hurricane and tropical storm systems not only generate storm surge but can also bring large, intense rainfall events. During a storm, water draining to the marsh below the WWTP has the potential to further aggravate flooding caused by high tides and storm surge. A hydrological analysis was carried out to better understand the role of rainfall-runoff flooding and storage capacity in the marsh below the WWTP.

The rainfall-runoff modelling assessment was completed because storm surge modelling alone could not explain the extreme flood levels experienced at the Lunenburg WWTP during the 2019 Hurricane Dorian event. Some overland flow from rainfall-runoff may have contributed to the extreme flood levels experienced at the WWTP.

The marsh is a natural low point collecting runoff from parts of Lunenburg and forested areas north of the WWTP. It is connected to the Back Harbour by culverts allowing runoff to freely drain. The culverts also allow high tides to freely flow into the marsh, which during extreme events can cause the flooding, such as during Hurricane Dorian. The hydrological analysis of the marsh seeks to understand the marsh's ability to capture and hold rainfall-runoff that may occur during high tide or from an obstruction to the culverts.

A hydrologic model was setup using PCSWMM, a software from Computational Hydraulics International (CHI [2019]), based on the US EPA's Storm Water Management Model 5 (SWMM5). SWMM5 is an industry standard software for stormwater management.

For this study, the watershed was defined as the land draining to the marsh below the WWTP, which encompasses forest, parkland, and residential areas bounded by Route 332 to the north, Maple Avenue and Dufferin Street to the south, and as far as Kaulback Street to the East. The total drainage area to the marsh is 48 hectares. The subcatchments were delineated using the provincial 1 m Lidar DEM as shown in Figure 5-1. Subcatchment runoff was routed to the marsh which was with modelled as a storage reservoir with a stage-storage curve extracted from its natural topography.

Figure 5-1. Stormwater model schematic

Land cover surface roughness for were assigned based on standard vales from McCuen, et al (1996) and impervious percentage for each subcatchment was estimated based on satellite imagery. Soil data for calculating infiltration losses was taken from digital soil maps produced by Agricultural and Agri-food Canada (2013). Soils types in the watershed include loam and sandy-loam, and the corresponding bulk hydraulic conductivity rates were taken from Rawls et al (1993) and adjusted to represent naturally compacted soils.

Rainfall events were simulated using historical intensity-duration-frequency (IDF) data from the Western Head climate station, located 52 km southwest near Liverpool, NS (ECCC, 2020). IDF data from the Western Head climate station represents 19 years of records. The Western Head IDF data has slightly higher storm magnitudes than that for the next closest climate station with IDF data (Shearwater in Halifax). IDF data was fit to idealized storm hyetographs using the Chicago type distribution as shown in Figure 5-2 (Keifer et al. 1957).

A 12 hour storm duration was selected to represent potential overlap with the timing of a high tide cycle.

Hurricane Dorian hit land on September 7th, 2019 and produced intense, and locally varied rainfall across Nova Scotia. At the three closest Environment Canada climate stations, rainfall depths varied substantially. The St. Margaret's Bay climate station recorded the highest rainfall depth of 140 mm, with the Western Head climate station (Liverpool) recording 128.5 mm, and the Shearwater climate station (Halifax) recording only 71 mm.

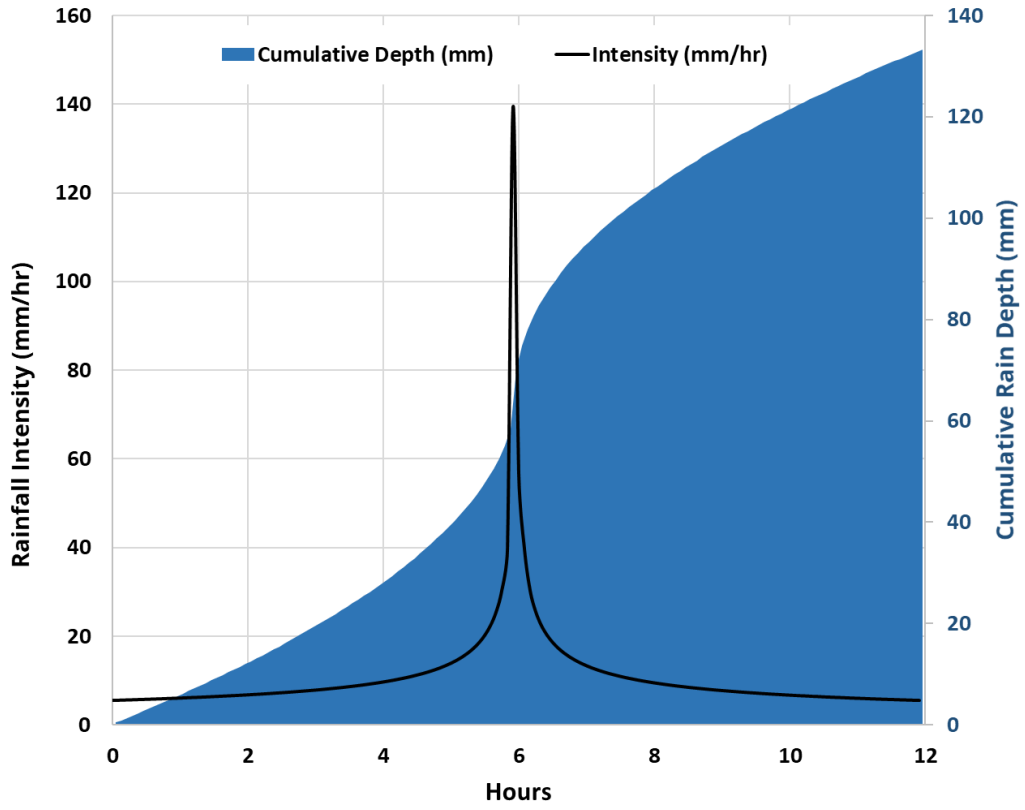


Figure 5-2. Design Rainfall Distribution shown for the 1:100 year IDF event

Modelling results for the statistical rainfall events are presented in Table 8 and illustrated in Figure 5-3. The 25-year return period rainfall event produced a maximum water level of 1.63 m which is just below the floor of the WWTP. The 100-year return period rainfall produced a maximum water elevation of 1.83 m, which equates to a depth of 0.13 m on the floor of the WWTP. The fifth scenario shows the 100-year rainfall with culverts allowed to freely drain (low tide) and results in a water surface elevation of 1.29 m.

Table 8. Modelling Results for Runoff to the Marsh

Return Period Event	Rainfall Depth	Runoff Volume into the Marsh	Water Surface Elevation at the Marsh
	mm	m^3	m (CGVD2013)
2-yr, 12 hour	68.9	2,894	0.90
10-yr, 12 hour	97.4	8,604	1.43
25-yr, 12 hour	112.3	12,420	1.63
100-yr, 12 hour	133.2	16,880	1.83
100-yr, 12 hour Free Draining	133.2	6,746	1.29
Hurricane Dorian	128.5 - 140.0 [1]	-	-

Note:

1. Rainfall estimates for Hurricane Dorian range from 128.5 mm at Western Head climate station to 140.0 at the St. Margaret's Bay climate station.

The first four scenarios are conservative in that the marsh is not allowed to drain the incoming runoff through the culverts. The results do suggest that runoff volume, combined with high tide conditions could contribute to flooding at the site. The timing window for these combined effects is limited to only the peak of the high tide, outside of which the marsh is allowed to drain stored runoff and regain its storage capacity. The fifth scenario highlights that under low tide conditions the culverts are able to sufficiently drain even the 100-year event without causing flooding up to the WWTP.

These results highlight that rainfall-runoff likely generated the additional flood elevation at the WWTP, in addition to the storm surge elevations. A flood mitigation, such as tidal gates, that block the marsh's drainage culverts, could lead to significant buildup of water in the marsh. During a large storm event, tidal gates would require monitoring and management to ensure that overland runoff is able to drain out of the marsh. Preventing short-term storm surge from flooding the marsh, followed by immediate relief of rainfall-runoff accumulation (by opening a flood gate to the Back Harbour) would most likely offer sufficient protection from flooding.

There appear to be localized drainage issues from Starr Street that may be adding to flood potential at the WWTP. The current preliminary modelling did not have required resolution to identify small scale flow paths from Starr Street to the WWTP. Mitigation options that impair drainage paths around the WWTP, such as berms, should be further evaluated with a finer resolution model. This will ensure proper design of mitigation options and help avoid unintended consequence from controlling the flow of water.

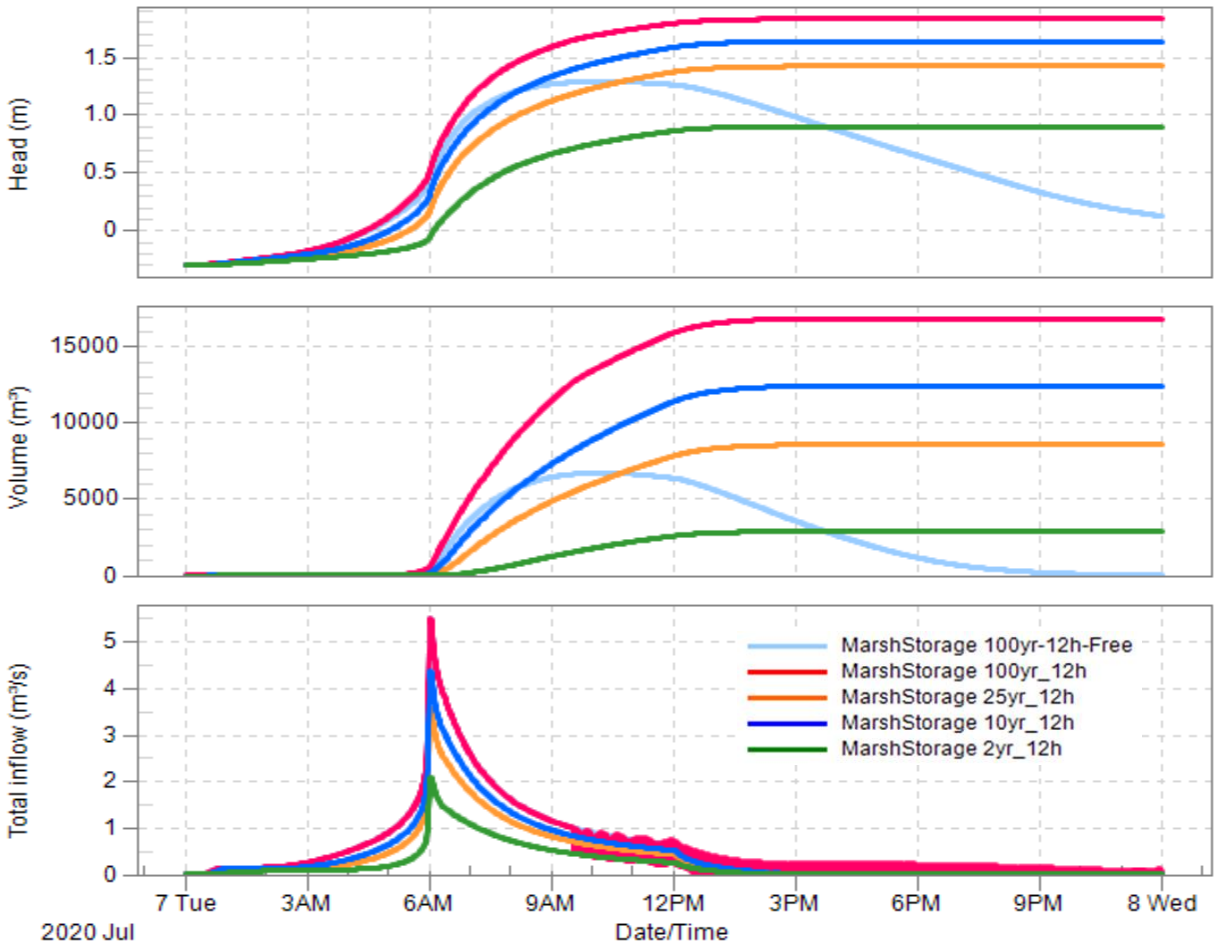


Figure 5-3. Modelling Results for Runoff to the Marsh

During a detailed design stage, further analysis of the proposed mitigation option is recommended in order to better understand the interplay of high tides, rainfall-runoff, the existing culverts, and localized stormwater flooding along Starr Street.

Chapter 6 Back Harbour Flood Map

Using the information gathered in the preceding chapters we are able to reconstruct the most likely flood levels experienced during Hurricane Dorian based on our storm surge and runoff modelling, engineering assessment, anecdotal information provided, and imagery. These flood levels are depicted in Figure 6-1 and are likely in the order of +2.11m CVGD 2013. This consists of a +1.71m CVGD 2013 flood level attributed to storm surge from back harbour based on numerical modelling investigations, and a +0.40m additional water level attributed to localized pooling, ponding and rainfall-runoff.

It is cautioned that flood maps generated as part of this study do not necessarily identify all areas subject to flooding, particularly in localized settings of small size, such as within the WWTP, with possible flooding sources other than coastal (including but not limited to surcharge or overflow). For this reason, the flood maps and flood data products are not prepared for, or suitable for, legal and surveying purposes. When using the flood maps and flood data for the Project, we recommend that the Town of Lunenburg consult CBCL, and review both the primary data and CBCL project reporting documentation to ascertain the usability of the information for the intended purposes.

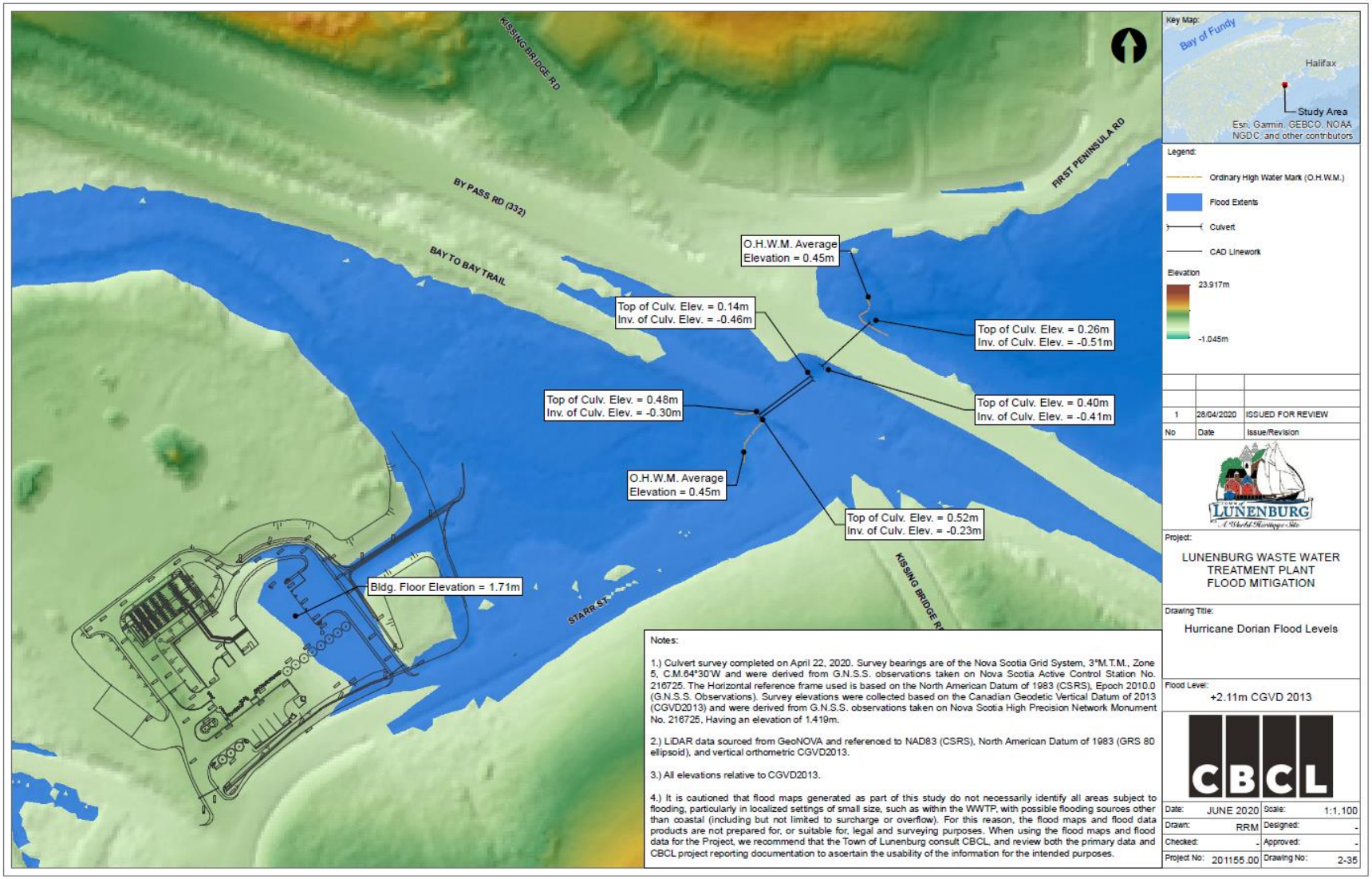


Figure 6-1: **Most likely flood levels experienced during Hurricane Dorian based on modelling, engineering assessment, anecdotal information provided, and imagery assessment (+2.11m CVGD 2013).**

Chapter 7 Flood Mitigation Options

Due to the probability of more severe flooding in the future, flood mitigations are a valuable tool to protect the existing infrastructure. Several different flood mitigations may be applicable at the site. Each option has its own benefits and drawbacks and will require further assessment to determine its technical feasibility and its overall value proposition (risk reduction versus cost). Table 9 provides a comparison of six (6) options identified, including potential benefits and drawbacks. These options include:

- Passive Tide Gate
- Controlled Tide Gate
- Temporary Culvert Plugs
- Raise Coastal Road
- Control Berms around WWTP
- Floodproofing inside WWTP

Further description of the flood mitigation options is presented below.

One set of options is to block the tides from coming through the culverts that connect the marsh to the coast. This includes different types of tidal gates installed at the coastal side of the culverts, as well as the option to use a temporary culvert plug. For tidal gates we consider:

- **Passive Flap Gates** - are commonly used in Nova Scotia to control the inland flow of tidal water at dykes. A passive flap gate is shown in Figure 7-1. The free hanging gravity flap is controlled by water pressures exerted on both side. During low tide the upstream freshwater pushes the flap open allowing drainage. During high tides the pressures from the coastal water slam the gate shut. It is assumed that the natural function of the marsh involves regular flooding from tide water. In that case, a passive flap gate could significantly alter its natural function. However, if the marsh is not regularly flooded with tide water, a passive flap gate, may have minimal impacts.
- **Controlled Gates** - could be operated by manual stem and valve or with a motorized system. A manually operated valve is illustrated in Figure 7-1. They can be shut just during the high tide event to exclude tide water and left open the rest of the time. This allows the marsh to retain its natural function. This option requires active management during a storm event and regularly maintenance to ensure its functioning properly.

A potential issue with either passive or controlled tidal gates is whether their headwalls can be constructed around the existing constraints of the roads and culverts. It is likely that construction of the headwall will require road upgrades and culvert replacement.

Gravity Type Flap Gate

Manually Controlled Gate Valve

Figure 7-1. Left - Gravity flap gate (Credit: Plasti-fab Inc.), Right - Manually controlled gate valve (Credit: Waterman Valve LLC)

Temporary culvert plugs are generally used for industrial water management to contain contaminant spills. As well, there are others examples of culvert plugs being used to isolate and dewater construction sites near culverts and in rare cases to plug major tunnels such as the New York City subway. Plugs are available in a range of sizes and materials. Typically, they are air filled however water filled options do exist.

Figure 7-2. Culvert Plug (Credit: Pro-active Inc).

The main drawback to their use will be health and safety hazards associated with installing and removing the plug during a storm event as well as working with pressurized system. As well, the buoyant forces of the submerged plug inside a culvert should be evaluated to ensure that it will not cause damage to the road surface.

Another set of option that was considered is to build berms or raise the road to prevent overland flooding. Potential locations of flood control berms and raising the height of Route 332 are shown in Figure 7-3.

Under current sea level and storm surge estimates, the coastal road (Route 332) is not at serious risk for flooding and during Hurricane Dorian water did not overtop the road. Route 332 currently sits at +2.6m CVGD2018, which according to our assessment of future flood levels would sustain flood levels up to 2070, for a 100-year return period event, under the most aggressive sea level rise scenario. Raising the road to protect the WWTP can therefore be categorized as a long-term objective. Raising the road would need to be done in conjunction with tide gates in the culverts in order to prevent sea water from entering the marsh.

Flood control berms located along Starr Street and at the outlet channel from the WWTP may prevent both overland flooding from Starr Street as well as coastal flooding coming from the marsh. A flood control berm constructed across the drainage channel below the WWTP must be capable of allowing drainage from the WWTP. This would be required to allow emergency overflow drainage from the plant as well as to relieve rainfall runoff during storm events. Berms should be designed and constructed to allow them to be raised in the future.

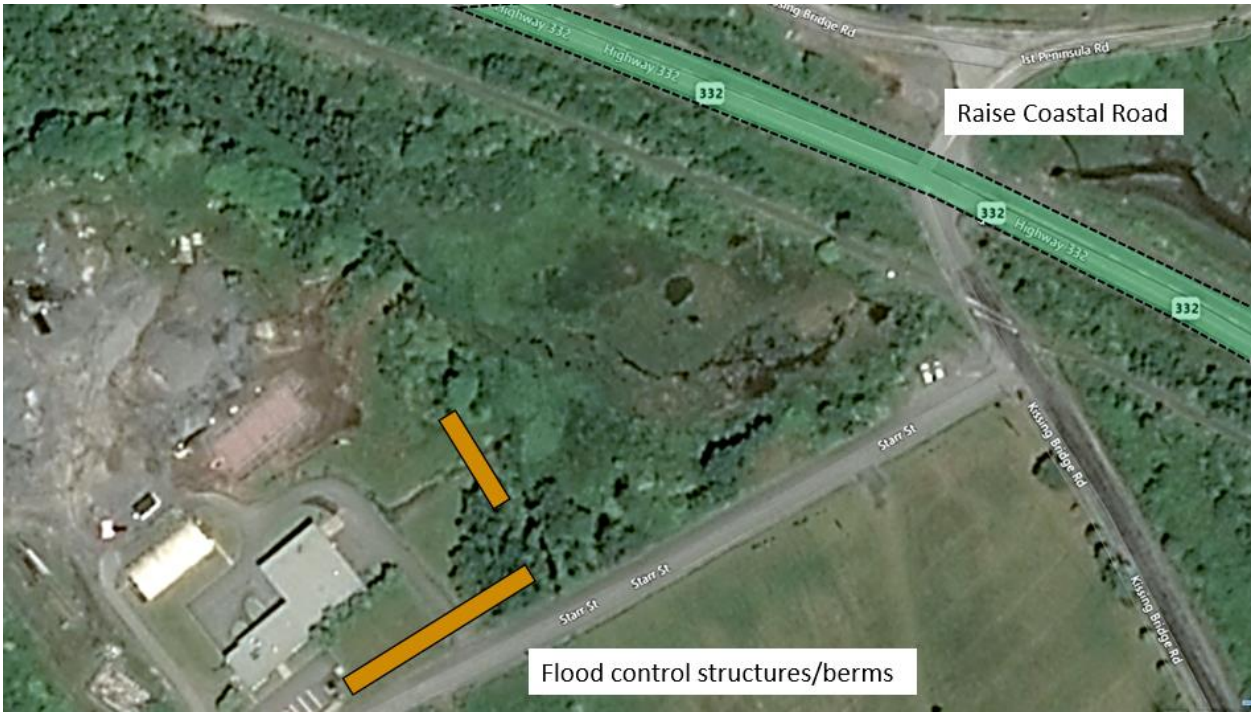


Figure 7-3. Location of Flood Control Berms and Raising Coastal Road

Floodproofing describes protecting specific equipment and infrastructure from flood waters. The most effective measure is to elevate, or raise, critical systems above the flood water level. For example, all electrical systems and powered equipment would be installed at a height above the floor. Some equipment cannot be raised and for that the next best option is dry floodproofing. Dry floodproofing involves constructing flood barriers or shields around individual pieces of equipment or areas that contain essential equipment to prevent floodwaters from coming into contact with critical equipment. Dry floodproofing may also include barriers along exterior doors to prevent water from entering the building. Floodproofing measures must also satisfy applicable codes and standards. The U.S. Federal Emergency Management Agency (FEMA) has many resources on floodproofing, including information on how to floodproof critical infrastructure such as water treatment plants.

Table 9. Overview of Flood Mitigation Options

Option	Details	Benefit	Drawbacks	Next Steps
Passive Tide Gate	Passive flap gate installed at downstream (coastal) side of culverts on Kissing Bridge Road or Route 332	▸ Operates independently with minimal management required ▸ Effectively prevents coastal flooding while allowing freshwater drainage	▸ Will impact the natural marsh ecosystem ▸ Construction of gate headwall structure along roadside requires further feasibility study ▸ Challenge of integrating new gate with older culverts	▸ Assess marsh ecosystem to determine if it is a salt marsh or freshwater system. ▸ Evaluate technical feasibility of constructing tide gate headwall on existing structure ▸ Consult with Department of Transportation and Infrastructural Renewal
Controlled Tide Gate	Manually or electronically controlled tide gate installed at downstream (coastal) side of culverts on Kissing Bridge Road or Route 332	▸ Allows gates to be closed only during coastal flooding events, thus allowing the marsh to retain its natural function	▸ Requires active management during a storm event and regular testing and maintenance ▸ Backup control system is recommended for redundancy ▸ Construction of gate headwall structure along roadside requires further feasibility study ▸ Challenge of integrating new gate with older culverts	
Temporary Culvert Plugs	Water or air filled bladder that is placed inside the culvert and inflated.	▸ Temporary measure that requires no new construction ▸ Will not affect natural marsh functions	▸ The timing of plug will be critical to its success and during long duration storms, it may hinder marsh drainage ▸ Health and safety risks associated with installing and removing the plug in culvert	▸ Gather more information on safety considerations and practicality of installing plug during storm event

			▸ Risk of damage to culvert due to buoyancy forces exerted from inside the culvert	
Raise Coastal Road	Raising the coastal road, Route 332, to prevent overtopping from storm surge. To be used in conjunction with tide barrier in the culverts.	▸ May prove effective for preventing flooding from future sea level rise.	▸ Based on current modelling the coastal road is not susceptible to flooding. With sea level rise raising the coastal road may prove valuable.	▸ Consult with Department of Transportation and Infrastructural Renewal to find out about future plans for road renewal / upgrades to Route 332.
Control Berms around WWTP	Construction of flood control berms along the east and south sides of the WWTP.	▸ Will not affect natural marsh functions ▸ Does not require construction along the Kissing Bridge Roadway or Route 332	▸ Berm should include drainage gates to allow collected stormwater and WW surcharge to be released through the berm	▸ Prepare conceptual design of berm with required footprint to determine if there is sufficient space on site for construction
Floodproofing inside WWTP	Renovation of the WWTP to move and protect essential equipment and infrastructure inside the plant	▸ Require no new civil construction (e.g. berms or tide gates) ▸ May also protect against internal WW flooding issues	▸ Flooding may still occur causing interruption to operations ▸ Health and Safety risk to staff working in the WWTP during flooding ▸ May not be feasible depending on the WWTP design.	▸ Prepare inventory of equipment and infrastructure within the WWTP that is susceptible to flooding and assess feasibility of raising or dry-proofing

Chapter 8 Recommendations & Conclusions

A flood study has been completed to understand the current and future flood risks at the Lunenburg waste water treatment plant. Numerical modelling and assessment of historical data has captured the flood conditions experienced at the WWTP during Hurricane Dorian, on September 7th, 2019. Using storm surge projections, combined with future sea level rise projections, a combination of short-term and long-term flood mitigation options were developed. These included six (6) passive and active management options. Based on the information presented in this technical report we recommend the following:

- Installation of an actively managed tide gate on the outer culvert to Back Harbour. This gate is to be closed during storm surge events, and opened to relieve any runoff accumulation in the marsh after the storm surge has subsided. This solution is estimated to be satisfactory until at least 2070 under both moderate and high sea level rise scenarios.
- Route 332 currently sits at +2.6m CVGD2018, which according to our assessment of future flood levels would sustain flood levels up to 2070, for a 100-year return period event, under the most aggressive sea level rise scenario. Raising the road to protect the WWTP can therefore be categorized as a long-term objective.

It is recommended to install a back-up generator at the WWTP itself, to ensure that all treated wastewater can be safely pumped to the Front Harbour, during an emergency situation, when the culverts have been closed to protect the WWTP from storm surge.

For an immediate, short-term solution the inflatable temporary culvert plugs may be considered, pending further assessment, testing and a thorough health and safety review of risks associated with the installation during emergency situations. The culvert plug is not considered a long-term solution, and should only be seriously considered if one of the more permanent solutions, such as the tide gate, cannot be implemented in the near future.

Some additional findings and conclusions based on the ongoing consultation and discussions with the Town of Lunenburg throughout this investigation include:

- The numerical models indicate that a direct Hurricane hit on Lunenburg will likely not produce the water level difference between Front and Back Harbour that was observed with Juan and Dorian (which made landfall further east). Water level differences between Front and Back harbour only occur during a very specific combination of

meteorological conditions, including wind speeds, path of the storm, and location of landfall.

- Back Harbour water levels will not increase if the culvert is closed, as the salt marsh volume is too small to affect the large back Harbour water body.
- Efforts should be taken to protect the marsh from any future infilling or impacts, and to maintain its existing footprint. It is important that the marsh sustain its existing carrying capacity to absorb rainfall-runoff when the culverts are closed during emergency storm surge situations.

The next steps to implementing the preferred flood mitigation strategy would be to:

- Develop a conceptual design of the recommended tide gate. This includes:
  - Determining the feasibility of constructing a new headwall to hold the gates along the side of the provincial road.
  - Conduct more detailed hydraulic culvert modelling.
  - Prepare preliminary design drawings of the tide gate solution.
  - Developing a preliminary cost estimate.
  - Determine the regulatory road map for approvals to build the tide gate.
  - Develop an operational management and maintenance plan for the proposed tide gate.
- Conduct consultations with Town officials, Nova Scotia Lands, Department of Transportation and Infrastructural Renewal and Department of Environment, to name a few.
- Developing a detailed design, final cost estimates, tender documentation, and construction specifications.
- Gain regulatory approvals, and authorization to proceed with construction works.
- Tender the project and select a preferred contractor to build the tide gate.
- Construction including supervisions services.
- Commissioning of the tide gate and continued maintenance and operational management.

We trust that the contents of this technical letter meet the objectives set out by Town of Lunenburg to investigate and better describe water levels in the Back and Front Harbour of Lunenburg, with an emphasis on flood elevations at the WWTP. Please do not hesitate to reach out to us for further clarification or additional information.

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September 18, 2020

Ian Tillard. P.Eng.
Town of Lunenburg
119 Cumberland Street
Lunenburg, Nova Scotia B0J 2C0

Dear Mr. Tillard:

RE: Town of Lunenburg Saltwater Intrusion Study Existing Conditions Review and Action Items

Background

CBCL Limited (CBCL) has been retained by the Town of Lunenburg (the Town) to complete a saltwater intrusion study of the existing sanitary sewer system. The existing sewer system, as of 2016, services a population of approximately 2,085, featuring 980 residential connections and 169 commercial connections. The collection system features 17km of gravity connections that flow into nine lift stations, with some of the system dating back to the early 1900's. While the system is generally combined in nature, some sections have been separated in the last 15 years.

Previous studies indicated that saltwater is entering their sewer collection system, increasing demands on the wastewater treatment plant. CBCL previously prepared a Wastewater Treatment Plant Evaluation report, which noted spikes in salinity, which were correlated to tidal patterns. An infiltration and inflow (I/I) report completed by CBCL in 2019 identified that municipal pumping stations were experiencing high I/I.

The Bluenose Drive, Fisherman's Wharf, Tannery Road, Brook Street, and Back Harbour lift stations were identified as lift stations that may be contributing to the high levels of I/I detected in the wastewater treatment plant. The majority of the Town's sewer collection system along the shoreline is at or below normal high tide level, compounding the risk of seawater intrusion. Malfunctioning overflow pipes and aging infrastructure (which can feature cracks, defects, and abandoned connections) could also be contributing to high I/I at these locations.

Existing Conditions Review

The first stage in the saltwater intrusion study was a review of the existing conditions within the Town. Records drawings, existing conditions drawings and reports, and information from Town staff was collected. This information was collected and reviewed to identify areas that could be below high high water level tide (HHWLT), which is 0.6m in CGVD13.

A conductivity sampling program was initiated during late August 2020 to take advantage of the highest tides of the study period. The sampling program involved CBCL staff and Town staff visiting the selected pump stations to sample and test grab samples from the wet wells, overflow chambers, and an upstream manhole. The grab samples were analyzed in-situ using a YSI handheld probe. To observe changes in the water quality during the tidal cycle samples were collected at both high tide and mid tide. The following Table 1 summarizes the conductivity results from the sampling program.

Table 1: Conductivity Sampling Data

	LS#3 – Fisherman's Wharf	LS#4 – Bluenose Drive			LS#6 – Back Harbour	LS#7 – Brook Street		LS#9 - Tannery Road	
Location	PS	PS	MH	Infil.	PS	PS	MH	PS	MH
Date	Aug. 19	Aug. 19	Aug. 19	Aug. 19	Aug. 21	Aug. 21	Aug. 21	Aug. 21	Aug. 21
Conductivity (uS/cm)	2,578	9,052	10,336	38,837	711	15,447	12,865	13,032	26,589
Salinity (ppt)	1.42	5.46	6.28	28.81	0.39	10.18	8.42	8.45	18.42

The sampling program identified elevated conductivity due to the influence of seawater (defined as salinity greater than 2.0ppt) in Bluenose Drive, Brook Street, and Tannery Road pump stations as well as upstream manholes. During the Bluenose Drive sampling infiltration was observed flowing from the joints of the manhole. Using a bucket, a sample was retrieved from the infiltration flow (shown as "Infil." In the table) and it corresponds to salinity levels of sea water (typical values for undiluted seawater are 50,000uS/cm and 35.0ppt). At all three pump stations there was no inflow into the pump station via surcharging overflows observed.

Furthermore, on August 25, 2020, CBCL conducted a survey in NAD83 MTM Zone 5 CGVD13 of the Bluenose Drive, Fisherman's Wharf, Tannery Road, Brook Street, and Back Harbour lift stations, to identify elevations and locations of existing infrastructure. The information from the survey is summarized below in Table 2.

Table 2: Surveyed Lift Stations

	Lift Station	Overflow Type	Surveyed Overflow Elevation (m, CGDV13)
LS#3	Fisherman's Wharf	Pipe	Pipe Invert; 0.73
LS#4	Bluenose Drive	Weir to Storm Sewer	Top of Weir; 1.17
LS#6	Back Harbour	Pipe	Pipe Invert; 1.47
LS#7	Brook Street	EX&PR. Inline Check Valve	Top of Weir; -0.45
LS#9	Tannery Road	Pipe c/w Check Valve	Pipe Invert; -0.42

It can be seen from this information that the Bluenose Drive (weir) and Back Harbour (pipe without check valve) overflows appear to be well above HHWLT. While Tannery Road is below this elevation, it is completed with a check valve, which CBCL has visual confirmation it is operational. In addition, Brook Street, while below HHWLT, is currently undergoing a retrofit to include an inline check valve upstream of the existing stormwater chamber (which also features a check valve, installed in 2014). However, Fisherman's Wharf (close to HHWLT) is subject to saltwater intrusion and is known to Town Staff not to be fitted with a check valve.

Later, the Town secured Clean Earth Technologies to provide underground video services of the sewer along Bluenose Drive. In addition, the Town attempted to video the overflow pipe at the Tannery Road lift station, however, were unable to reach the check valve in this pipe. The Town verbally confirmed there are not check valves in the overflow pipes at the Fisherman's Wharf and Back Harbour lift stations. No video was attempted at these locations.

Proposed Action Items

Using the information that was collected during the first stage of the project CBCL has begun to develop action items to alleviate the amount of saltwater intrusion the Town's collection system is receiving. These action items are listed below and described in the following section

- Bluenose Drive Sewer Upgrades.
- Fisherman's Wharf Overflow Upgrade.
- Bluenose Drive Overflow Upgrade.
- Back Harbour Overflow Upgrade.

The Brook Street existing weir/check valve system, which the top of weir was surveyed to be below HHWLT, is known to be currently going through a retrofit. It is CBCL's understanding that the existing weir/check valve system is being maintained, and a new, inline, check valve is being placed in the stormwater pipe upstream of the existing stormwater chamber.

Several of the proposed action items will include adding a check valve to an overflow pipe. When a check valve is placed in an overflow pipe, under normal operation, this will prevent seawater from flowing up the overflow pipe into the pump station. However, in certain situations there is still risk associated with this arrangement. For example, during a significant storm event at high tide, the check valve would be closed to prevent seawater backup. If the storm were to persist and the water level within the pump station were to approach the overflow pipe invert, there would be a risk of the sewer system backing up. In order to prevent this, the stored water within the pump station would be required to have sufficient head to overcome the head loss through the check valve (this can be significant), or the sanitary service connections would need to have a suitable elevation difference from the pump station overflow pipe. Check valves on service connections could also be used to mitigate this risk.

These action items will be discussed in further detail below.

Bluenose Drive Sewer Upgrades

During the CBCL site visit to perform conductivity testing, both CBCL and Town Staff witnessed seawater infiltration within the collection system along Bluenose Drive. In addition, the video completed by Clean Earth Technologies showed evidence of seawater infiltration. This infrastructure is aging and is known to be below the high tide level. Upgrading this infrastructure could alleviate overall seawater intrusion and loading on the wastewater treatment plant.

One option would be to use trenchless technologies such as cure in place pipe (CIPP) to install a new pipe within the existing pipe. The new pipe would act as an impermeable barrier to seawater infiltration. Another option would be use conventional excavation methods to remove the existing

infrastructure and replace it with new PVC piping. Of the two options, the trenchless method would be more cost effective, quicker, and less disruptive and provide the same level of service and longevity as a new PVC piping.

Fisherman's Wharf Overflow Upgrade

Town staff have verbally confirmed that there is no check valve located on the Fisherman's Wharf overflow pipe. With the invert of this pipe approximately 10cm (4 inches) above HHWLT, it is very likely saltwater will enter the system at this location. Town staff have confirmed they have witnessed saltwater entering the collection system through this overflow pipe.

Remedial options include placing an in-line check vale within the existing 450mm PVC pipe, or entirely replacing the overflow pipe with one including a check valve. It should be noted that any work that includes work in the harbour will require extra permitting. Assuming the condition of the overflow pipe is acceptable installing a new check valve in the existing pipe would be the quickest and most economical.

Bluenose Drive Overflow Upgrade

The elevation of the top of the weir located within the Bluenose Drive lift station is above the HHWLT. However, in frequent-recurrence storm surge events, there is still risk of seawater entering the system at this location. Placing an in-line check valve, or entirely replacing the overflow pipe to one including a check valve, would reduce this risk. It should be noted that any work that includes work in the harbour will require extra permitting. Assuming the condition of the overflow pipe is acceptable installing a new check valve in the existing pipe would be the quickest and most economical.

Back Harbour Overflow Upgrade

The Back Harbour lift station does not feature a check valve, however, the overflow pipe has an invert that is relatively high compared to the HHWLT. In many normal tide level situations, saltwater will not enter the system directly from this invert. However, in storm surge events, where the water level rises above normal elevations, there is a risk of saltwater entering the system if a check valve is not present.

With this in mind, upgrading the overflow pipe at the Back Harbour lift station to feature a check valve would be beneficial to the collection system in the long term. An inline check valve may be an option, however, due to the overflow pipe being made of concrete this may not be the optimal solution. Entirely replacing the overflow pipe to include a check valve would be an option, however, would have higher capital cost.

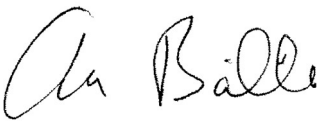
Conclusion

CBCL has completed the first three tasks of the Saltwater Intrusion Study, as outlined in the proposal to the Town of Lunenburg. Having now completed assessing the various sources of information, including record drawings, survey, conductivity tests, SCADA data, and Town Staff experience, CBCL has determined likely sources of saltwater intrusion and begun to develop action items for the Town to consider. Our next steps will include continuing to develop the conceptual level sketches and to begin to develop probable opinions of cost.

Should you have any questions about the process to date, or the action items included in this letter, please do not hesitate to reach out to us and we would be happy to assist.

Yours very truly,

CBCL Limited



Aaron Baillie, P.Eng.
Manager, Municipal Engineering
Direct: 902-421-7241 Ext. 6750
Email: aaronb@cbcl.ca

CC: Sarah Ensslin, M.Sc., P.Eng.

Project No: 201021.00

News release

Nova Scotians to Have Input on New Traffic Safety Act Drivers Regulations

Transportation and Infrastructure Renewal (../search?dept=121)
September 17, 2020 - 10:32 AM

Nova Scotians are invited to provide feedback on the province's draft regulations under the new Traffic Safety Act.

The proposed drivers regulations are being made available online for public comment effective today, Sept. 17.

The draft regulations are being released in stages, beginning with drivers regulations, followed in sequence by the regulations for vehicles, rules for using the road and penalties and other administrative changes. Each phase for public input will last 30 days.

It is the first time Nova Scotia has made draft regulations of this magnitude available for public comment prior to

proclamation.

“Many months and extensive consultation with targeted stakeholder groups have gone into the development of these draft regulations. Now it is time to hear what Nova Scotians have to say,” said Transportation and Infrastructure Renewal Minister Lloyd Hines. “The existing act was written in the early 1920s and we need to modernize our laws. We want the new act to be more flexible and responsive.”

The new Traffic Safety Act, replacing the Motor Vehicle Act, was passed in 2018. The new act will govern and regulate the registration and identification of motor vehicles and the use of provincial highways and roads. This includes drivers licences, the registration and inspection of vehicles, traffic laws and equipment standards.

The drivers regulations address standards, licensing, training and suspension.

Key improvements to the more than 80 regulations affecting drivers include:

- updating the licence classification system to reflect the national standard
- changes to the demerit point system to harmonize with the rest of the country by reducing suspension time and eliminating conditional licenses

(/connect/)

Related information

- Media enquiries (https://beta.novascotia.ca/media-contacts)
- Search news releases (/news/)
- Archive: news releases from 1995-97 (/news/archive.asp)

- simplifying the steps for obtaining a graduated drivers licence and learners permits for commercial vehicles
- clarity and consistency for driver education courses
- eligibility and medical requirements for different drivers classes
- application and renewal processes for drivers licences

The act and regulations will take effect following the public review phase and once upgrades to the Registry of Motor Vehicles computer system are completed.

Nova Scotians can get more information and provide feedback by going to: https://novascotia.ca/traffic-safety-act-public-engagement/ (https://novascotia.ca/traffic-safety-act-public-engagement/)

The deadline for feedback on the drivers regulations is Friday, Oct. 16.

Quick Facts:

- the Traffic Safety Act was passed unanimously in the fall of 2018 and will replace the Motor Vehicle Act, which was written in the early 1920s
- the act is designed as a framework, setting broad policy and regulatory authority to quickly address changing technologies and future road-safety needs
- since the last major revision in 1989, the Motor Vehicle

Act has been amended more than 62 times

- the legislation, once in effect, will be more concise than the current Motor Vehicle Act, moving technical detail to regulation and allowing more flexibility and responsiveness to emerging issues
- the Traffic Safety Act reflects significant stakeholder engagement with 31 groups and 23 partners including Bicycle Nova Scotia, Insurance Bureau of Canada, Road Safety Advisory Committee, Nova Scotia Chiefs of Police and Nova Scotia Federation of Municipalities

Additional Resources:

Bill 80 – The Traffic Safety Act: https://nslegislature.ca/legc/bills/63rd_2nd/1st_read/b080.htm (https://nslegislature.ca/legc/bills/63rd_2nd/1st_read/b080.htm)

-30-

Media Contact:

Deborah Bayer
Cell: 902-225-4982 (tel:+19022254982)
Email: Deborah.Bayer@novascotia.ca (mailto:Deborah.Bayer@novascotia.ca)

Kelly Jardine

From: Chris Anderson [mailto:chrisa4849@gmail.com]
Sent: October-19-20 10:13 PM
To: Bea Renton <brenton@explorelunenburg.ca>
Subject: LFHS Summer Concert Series

Bea

Yesterday (Sunday, Oct. 18), was the final (and only the second Rain-date) of the Lunenburg Folk Harbour Society's 15 events of the Summer Concert Series held on the Lunenburg Bandstand.
The entire LFHS Summer Concert Series very much pleased us and the 2430 audience members in attendance with various types of musical entertainment that was skillfully provided by performers from all parts of Nova Scotia (including Lunenburg County).
Of particular note was the cooperation of the audiences (averaging 162 people per concert) to maintain social distancing and gathering in family bubbles, as requested.
We are most grateful for the Town of Lunenburg's financial support (in memory of Susan and Guenther Reibling) and for the opportunity to use the Lunenburg Bandstand. There is no doubt that we look forward to bringing music to the Lunenburg Bandstand in future summers.

Be well!

Chris Anderson
Director; Site Chairperson
Lunenburg Folk Harbour Society

P.S.: While removing equipment from our final event, we noted that the metal casing of the electrical cable that feeds one of the six electrical outlets located under the circumference benches on Lunenburg Bandstand has *rusted out*. This should be replaced to ensure the safety of those using the Lunenburg Bandstand in the future.

TOWN OF OXFORD
5201 MAIN ST.
P. O. BOX 338
OXFORD, NOVA SCOTIA
B0M 1P0

PHONE: 902-447-2170
FAX: 902-447-2485

20 October 2020

Honourable Stephen McNeil, Premier
Province of Nova Scotia
PO Box 726
Halifax, NS B3J 2T3

Dear Premier McNeil:

The Town of Oxford Council met on October 19, 2020 and discussed the correspondence that was sent to you by the Municipality of Pictou County, dated October 7, 2020. The subject of the letter deals with the impact of COVID-19 on community rinks and the ability to continue to operate in this new normal routine that we are facing because of the pandemic.

This issue hits home for the community of Oxford. Through a challenging budget discussion earlier this year, the ability to host sporting events, public skating, and other events at our community arena were the basis of a discussion around how the Town could afford to potentially outlay the expense of opening the arena in November for normal operations, with questionable chances of having those operations support that expense. Similar to the Municipal of Pictou County, the increased expenses of COVID protocols, decrease of user groups, and the willingness of the general public to gather in public spaces for physical activity were all factors within Council's difficult decision. As a result, the Oxford arena remains closed for this winter season.

This impacts our community through less employment for our two seasonal employees, reduced opportunity for physical and social activities, decreased revenue for facility use and advertising of local businesses, and the loss of larger groups that frequent our local business establishments. It is unclear how long this pandemic will affect our municipal and community activities and programs. In a community where the arena is a focal gathering place during the colder and darker months of the year, this closure creates a broader mental health impact through additional loss of social connection and physical activity.

Therefore, Oxford Town Council supports the Municipality of the County of Pictou in its resolution to your Government to develop a support program that will assist community arenas in their operations for both this year and subsequent years to recover from COVID-19 impacts.

Sincerely,

Patricia Stewart
Mayor

cc NS Municipalities
Nova Scotia Federation of Municipalities
Tory Rushton, MLA Cumberland South

Kelly Jardine

From: Gibb, Fiona <Fiona.Gibb@novascotia.ca>
Sent: October 30, 2020 10:11 AM
To: Gibb, Fiona <Fiona.Gibb@novascotia.ca>
Subject: DoB Stakeholder Communique

NOVA SCOTIA'S ACCOMMODATIONS OPERATORS RECEIVING ASSISTANCE WITH PROPERTY TAX BILLS

The Tourism Accommodations Real Property Tax Rebate Program will provide qualified operators a 25 per cent rebate on payment of 2020-21 commercial property tax. The program opens Nov. 16.

To be eligible, a business must meet the definition of a roofed accommodation as set out in the Tourist Accommodation Registration Act, be registered as a host under the act, have more than five rooms and have paid their tax bill in full.

Qualified operators must, for the period from April 1, 2020 to Oct. 31, 2020, have incurred a year-over-year revenue loss for room accommodation of greater than 30 per cent compared to same period the previous year. New operators who were not in business before April 1, 2020 may still be entitled to a rebate if they can demonstrate lower than 50 per cent occupancy rate since opening their business.

Program information and eligibility criteria is available at: https://novascotia.ca/coronavirus/support/#support-for-business

Tourist Accommodation Registration Act:
https://nslegislature.ca/sites/default/files/legc/statutes/tourist%20accommodations%20registration.pdf

RJSC CHANGING TO BETTER SERVE NOVA SCOTIA BUSINESSES

The province is working to significantly improve client service for the Registry of Joint Stock Companies (RJSC). A new system will be launched in the coming weeks. It will provide a more modernized registry experience saving time and making transactions easier. All RJSC customers and businesses will benefit from this change including partnerships, companies, cooperatives, and societies.

CAPE BRETON MUNICIPALITES POST UPDATED, MODERNIZED BYLAWS ONLINE

Businesses across Cape Breton can be assured that municipal bylaws found online are complete and up-to-date, making dealings with local governments easier. Municipalities completed an extensive review after businesses identified incomplete regulatory information online as a barrier. This is the first step of several for the municipalities in modernizing regulations in the region.

The Cape Breton Partnership and the provincial Office of Regulatory Affairs and Service Effectiveness held sessions with businesses across Cape Breton in summer and fall 2019. Businesses identified difficult to find, outdated municipal bylaws on-line as a barrier for them. The office and municipalities worked together to develop plans to modernize the regulations.

The initiative is part of a broader partnership between the office, Cape Breton Regional Municipality, the counties of Inverness, Richmond and Victoria, and the Town of Port Hawkesbury to make it easier for island businesses to open, operate and expand. Each municipality has a plan to review, update and modernize their bylaws.

For more information on the plans to modernize regulations go to, https://capebretonpartnership.com/ren/cb-regulatory-modernization/

SINGLE-USE PLASTIC BAG BAN IN PLACE

Government is banning single-use plastic bags to encourage waste reduction at the source and to help keep plastic out of our environment and landfills. The law applies to all businesses, not just grocery stores.

As of Oct. 30, businesses can't use any plastic bag inventory they have left, except for items that are exempt from the ban.

Businesses can choose how to manage remaining plastic bags. They can recycle the bags, sell them or ship them to a business location in a province without a plastic bag ban. They can also donate them to a charity, like a food bank, that can use plastic bags when serving their clients.

For more information, visit https://novascotia.ca/single-use-plastic-bag-ban/

TOURISM PARTNERS PROMOTE UNIQUE NOVA SCOTIAN VACATION PACKAGES

Tourism operators are putting research into action and marketing packages that showcase the unique experiences Nova Scotia has to offer. The new RADIATE Tourism Program is supporting 51 partners from across the province to create and promote packages to travellers in Nova Scotia, New Brunswick, and Prince Edward Island.

Tourism Nova Scotia launched the RADIATE Tourism Program in July to help operators create and promote packages that research showed would appeal to local and Maritime travellers. The program offers partners coaching, market research insights, and marketing support to help raise their profile in the Maritime region.

A travel package combines two or more tourism activities, experiences, or products for one single price to make it convenient and easy for travellers to purchase and plan their visit around Nova Scotia. It can also provide travellers with easy access to new places or experiences in Nova Scotia, or lesser visited parts of the province. This is important, as research indicates that while local and regional visitors will naturally gravitate towards familiar places and experiences, they will welcome opportunities to discover aspects of Nova Scotia that are new to them.

Examples of new offerings include a partnership between Amos Pewter and Rebecca's Restaurant that will encourage visits to Mahone Bay this winter. The two packages include an artisan tour of Amos Pewter's workshop and a new hands-on seasonal pewter experience paired with a meal featuring local flavours at Rebecca's Restaurant. Taste Halifax Tours is creating a new experience with Chain Yard Cider to offer a package featuring a flight of cider tastings with food pairings led by the first pommelier in eastern Canada. The Cliffs of Fundy Geopark are working with Tourism Nova Scotia to host local social media influencers who will create content and awareness by sharing stories with their audiences.

See all of the RADIATE Tourism Partners at https://tourismns.ca/radiate

CAPE BRETON PPE MANUFACTURERS

The Cape Breton Partnership has compiled an online resource to support Cape Breton businesses safely reopen and support local PPE manufacturers, suppliers and service providers. Click here to see the full list, which is updated regularly. If you want to be listed, or are aware of other companies that should be added, please email info@capebretonpartnership.com

INNOVATION EQUITY TAX CREDIT

Business investment in innovation creates jobs, grows exports and drives the provincial economy. The Innovation Equity Tax Credit (Innovation ETC) is a non-refundable personal and corporate income tax credit available to eligible investors who invest in approved corporations. It is one way government is encouraging

investors to make equity capital investments in eligible Nova Scotia small and medium businesses engaged in innovative activities.

The tax credit focuses on innovation-driven entrepreneurship and since its launch has encouraged greater investment in the province's businesses, including oceans technology and life sciences sectors.

The credit for individuals is 35% of an eligible investment made in an approved corporation and increases to 45% for investments in approved oceans technology and life sciences sectors. The maximum annual investment amount for an individual is $250,000. The credit for an eligible investor that is a corporation is equal to 15% of an eligible investment made in an approved corporation. The maximum annual investment amount for a corporation is $500,000.

For more information visit
https://www.novascotia.ca/finance/en/home/taxation/tax101/personalincometax/innovationequitytaxcredit.aspx

ICYMI - Business Tax Reductions
Effective April 1, 2020, Nova Scotia reduced tax rates for businesses. The corporate income tax rate was reduced to 14 per cent, bringing Nova Scotia in line with New Brunswick for the lowest rate in Atlantic Canada, and the small business tax rate was reduced to 2.5 per cent to support small business owners.

The changes were announced as part of Budget 2020-21 https://novascotia.ca/budget/#two .

DIGITAL ADOPTION PROGRAM OPEN FOR APPLICATIONS
Nova Scotia Business Inc.'s (NSBI) Digital Adoption Program has re-opened. Applications will be accepted online and via the Regional Business Development team until Dec. 1, 2020.

The Digital Adoption Program supports Nova Scotia businesses to rapidly adopt digital tools and innovation. The program will provide financial incentives to Nova Scotia small businesses to:

- Build or improve their online presence to retain and create new sales opportunities and improve firm resilience and flexibility to keep pace with the changing nature of business;
- Adopt digital tools and implement process improvements related to e-commerce solutions and to support remote working; and
- Implement machinery and equipment upgrades, including control software and control hardware, industrial automation and monitoring, and digital supply chain implementations.

The program contributes up to 50 per cent of eligible costs to a maximum of $10,000 CAD. Minimum project cost is $2,000 CAD. New eligibility requirements have been implemented, shifting focus towards exporters.

More information on application requirements is available here nsbi.ca/dap

APPLICATIONS OPEN FOR SECOND ROUND OF FORESTRY INNOVATION FUND
Applications for the second round of the Forestry Innovation Transition Trust will be accepted during November. Applications open Nov. 1 and close Nov. 30.

The $50-million-fund was announced in February to continue to advance the transition and development of Nova Scotia's forestry sector. Twenty-two applications were received in the first round. Those applications are being reviewed with decisions expected in early December. The fund will be available until March 31, 2025, or when the funds have been spent.

The trust may be used by companies, organizations or post-secondary institutions working and researching in the forestry and biological resources sectors. A three-member trustee board will review submissions and make spending decisions.

Application guide and forms are online at http://novascotia.ca/forestry-trust/

Government's forestry sector support website is at: https://novascotia.ca/forestry-sector-support/

UPCOMING WEBINARS
Google My Business and Other Google Tools for your Business
Date: Thursday, November 5, 2020
Time: 10:00 a.m.
Learn about the Google tools available to support your business in a webinar with Google Canada representatives. Donna Chang, Tourism Lead, and Jenny Vincent, Account Manager with Google Canada, will share the latest best practices for Google My Business profiles along with the Google Guide for Small and Medium Businesses.

Register at
https://us02web.zoom.us/webinar/register/1216032858380/WN_f-usEhGARumnmXGyeB8FvQ

RESOURCES
Provincial COVID-19 website: https://novascotia.ca/coronavirus/

Provincial News Releases - www.novascotia.ca/news

To watch live and previous webcasts:
visit: https://www.youtube.com/playlist?list=PLwLZ9YtgHtLCpATUVFKVf72xyF103eHaE

Business Navigators: More information on this service is available https://novascotia.ca/regulatoryopportunity/business-navigators.asp. Navigators are available by calling or 1-844-628-7347 , 902-424-4475 Monday through Friday 8am to 5pm or by email BusNavigation@novascotia.ca

Government of Canada: https://canada.ca/coronavirus

Fiona Gibb
Communications Director
Department of Business
mobile 902.478.5573

The Department of Business is located at 1809 Barrington Street (CIBC Building), Suite M103, Halifax, B3J 3K8

Kelly Jardine

From: Laura Wright <lwright@cnsopb.ns.ca>
Date: November 4, 2020 at 11:56:20 AM AST
Subject: CNSOPB News Release - Draft Western Scotian Shelf and Slope Strategic Environmental Assessment - Opportunity to Provide Comments

Good morning,

Please note that we have just posted the Draft Western Scotian Shelf and Slope Strategic Environmental Assessment on our website. We invite you to review the document and provide your comments using our online submission form by December 4, 2020.

If you have any questions, please contact me.

Laura Wright

Laura Wright
Communications Advisor

Canada-Nova Scotia Offshore Petroleum Board
1791 Barrington Street
8th Floor, TD Centre
Halifax, NS B3J 3K9

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Burke,
Macdonald
& Luczak
Barristers & Solicitors

Patrick A. Burke, QC
David K. Macdonald, BSc, LLB(Retired)
Piotr Luczak, BA, LLB

November 23, 2020

Bea Renton
CAO
Town of Lunenburg

Via Email

Dear Bea:

Re: Solid Waste Management Bylaw

Enclosed herewith please find a clean version of the Bylaw to post with the Council Agenda Package.

I would note that the extra word "and" was deleted in clause 23 at the bottom of page 10.

I trust this is satisfactory.

Yours very truly,

BURKE, MACDONALD & LUCZAK

Patrick A. Burke, Q.C.
PAB/js
Encl.
CC Kelly Jardine

Z:\PAB - WIP\1 - OPEN\4 - Town Files\Town - Solid Waste Bylaw\Letters\Letter to Bea November 23, 2020.docx

TOWN OF LUNENBURG

A BYLAW TO PROVIDE FOR THE SEPARATION, STORAGE, PLACEMENT, COLLECTION AND TRANSPORTATION OF SOLID WASTE RESOURCES GENERATED WITHIN THE TOWN OF LUNENBURG

BY-LAW NUMBER #38

SHORT TITLE:

1) This Bylaw shall be known and may be cited as the "**Solid Waste Management Bylaw**".

DEFINITIONS:

2) Words used in this Bylaw shall take their meaning from their context and from dictionaries of the English (Canadian) language, except as follows:

   a) "**approved storage bin**" means a storage bin designed for the temporary storage of collectible waste and which meets the following specifications:

      i. is constructed of wood or other sturdy material and in such a manner as to be inaccessible to pests, rodents, vermin, seagulls or animals;

      ii. is fitted with a securely-hinged lid weighing not more than 5.0 kilograms (11.0 pounds);

      iii. is not equipped with a self-locking latch; and

      iv. is equipped with a means of securing the cover in an open position.

   b) "**blue bag recyclables**" means glass jars and bottles, cans (whether made of aluminum, steel or tin), plastic containers, plastic bags, film stretch and pallet wrap, milk and juice containers together with such other items as may, from time to time, be designated by Council as blue bag recyclables;

   c) "**boxboard**" means cereal, shoe, tissue, detergent, cracker, cookie, baking product and frozen food boxes, toilet paper rolls and paper towel rolls or other similar items;

   d) "**branches and limbs**" means branches, limbs and brush;

   e) "**bulky waste**" means large items including but not limited to: vacuum cleaners, windows weighing not more than 100 kg (220.5 lbs.) and measuring not more than 1.8 meters (5.91 feet) in its longest dimension, furniture, mattresses, box springs and porcelain bathroom items such as toilets and sinks, barrels, pallets, white goods, metal items, artificial Christmas trees, as well as small quantities (in bundles) of construction or demolition materials weighing not more than 100 kg (220.5 lbs.) and measuring not more than 1.8 meters (5.91 feet) in its longest dimension, subject to special requirements for collection of bulky waste elsewhere in this Bylaw; and for the purposes of this Bylaw shall be deemed to include a clear bag of residual waste;

f) "**collectible waste**" means those wastes which are eligible for collection, within the volume and other restrictions outlined elsewhere in this Bylaw, on regularly-scheduled collection days and consists of the following categories of waste:

   i. organic materials (as defined herein);

   ii. recyclables (as defined herein);

   iii. residual waste (as defined herein); and

   iv. bulky waste (as defined herein).

g) "**collection calendar**" means a calendar prepared and distributed by the Town illustrating the collection schedule for the various waste streams and the routes, as amended from time to time (and without restricting the generality of the foregoing, the term collection calendar shall be deemed to include any display thereof on the Town's website);

h) "**commercial container**" means any container used for the storage of properly sorted collectable waste generated from r e s i d e n t i a l , multi-residential, institutional, commercial, industrial or other premises within the Town which waste exceeds the maximums or is outside the types of waste allowed on regular or special collection days as outlined elsewhere in this Bylaw and which container is designed to be emptied by, and the waste transported by, a hauler;

i) "**construction or demolition materials**" means left-over material generated as a result of any form of construction or renovation and materials generated from demolition activity including but not limited to: asphalt, brick, mortar, polystyrene or fiberglass insulation, cellulose, drywall, plaster, shingles, metal and scrap wood – regardless of whether such left- over material is regulated by the Province of Nova Scotia or meets the definition of "C & D Debris" in the N.S.E. 1997 Guidelines for same, but does not include any hazardous or restricted materials such as asbestos;

j) "**container**" means any vessels or bag as described herein which the property owner is responsible to provide and maintain, place for collection and clean up after if waste materials come out of the container whether on the property owner's property or municipal property for collection.

k) "**contaminated soil**" means any soil which has been polluted with an organic or inorganic contaminant in excess of standards prescribed or adopted by the Minister of Environment for the Province of Nova Scotia, and that has caused, is causing, or may cause an adverse effect;

l) "**Council**" means the Council of the Town of Lunenburg;

m) "**dispose**" means any form of disposal of any material, including solid waste as defined herein, and includes burning or any of the following whether temporary or permanent: deposit, storage, placement, or burial regardless of whether or not the material being,

or having been, deposited, stored or placed is in a box, bin, container or any other containment device;

n) "**designated electronic products**" means those electronic products as designated in the Electronic Products Stewardship Program pursuant to the Solid Waste-Resource Management Regulations made under Sec. 102 of the Environment Act of Nova Scotia;

o) "**dwelling unit**" means one or more habitable rooms designed, occupied or intended for use by one or more persons as an independent and separate housekeeping establishment in which kitchen, sleeping and sanitary facilities are provided for the exclusive use of such persons;

p) "**eligible premises**" means a property within the Town which is eligible for collection services – up to the maximum restrictions outlined elsewhere in this Bylaw – and includes all properties in the Town whether located on private roads or public streets;

q) "**food waste**" means uneaten food and food preparation waste and food material that is discarded or unable to be used including, without limiting the generality of the foregoing, fruit and vegetable peelings, table scraps, meat, poultry and fish, shellfish, dairy products, cooking oil, grease and fat, bread, grain, rice and pasta, bones, egg shells, coffee grounds and filters, tea leaves and bags or other similar items;

r) "**green cart**" means an aerated plastic cart designed for the short-term external storage of organic materials prior to collection and for the placing out for collection of same;

s) "**hauler**" means any public or private company or person who transports solid waste from within the Town to Kaizer Meadow (defined herein);

t) "**household hazardous waste**" means any corrosive, flammable or poisonous material or substance such as oil and oil products, radioactive materials, acids, poisons, insecticides or other poisons used for agricultural purposes or for rodent control, any substance or chemical highly lethal to mammalian or aquatic life and any substance or chemical dangerous to the environment – including but not limited to: batteries, left-over liquid paint, left-over corrosive cleaners, pesticides or herbicides, gasoline, fuel oil and used motor oil, solvents and thinners, pharmaceuticals, drugs and needles, aerosol cans which contain hazardous substances, propane tanks and small propane cylinders or canisters such as those used for camp stoves or propane torches;

u) "**leaf and yard waste**" means grass clippings, leaves, twigs, house and garden plants or other similar items as well as branches, limbs or brush – the latter three being subject to special requirements elsewhere in this Bylaw;

v) "**Kaizer Meadow**" means the Kaizer Meadow Environmental Management Centre which is a solid waste management facility and is located at 450 Kaizer Meadow Road, Chester and their designated operator the Municipality of Chester;

w) "**metal items**" means medium to large metal items including metal fencing, water tanks, oil tanks – subject to special requirements elsewhere in this Bylaw – and

metal containers other than containers designed to hold either household hazardous waste (as defined herein) or anything intended for human consumption;

x) "**mini-bin**" means a small plastic container designed for the short-term internal storage of organic materials prior to deposit in a green cart;

y) "**non-collectible waste**" means all material other than collectible waste and, without limiting the generality of the foregoing, includes:

i. highly combustible or explosive materials including, without limiting, fireworks, flares, celluloid cuttings, motion picture film, oil or gasoline soaked rags, gas containers, chemicals, acids or other combustible residues, fine dry sawdust, ammunition, dynamite, or other similar material;

ii. materials that are considered pathogenic or biomedical including, without limiting, dressings, bandages or other infected materials or sharps discarded in the course of the practice of physicians, surgeons, dentists or veterinarians;

iii. carcasses or parts of any animal except food waste;

iv. waste listed or characterized as hazardous by any Federal or Provincial law – including "household hazardous waste" as defined herein;

v. designated electronic products;

vi. solid waste generated, or originating from, outside the Town;

vii. liquid waste or material that has attained a fluid consistency and has not been drained;

viii. soil, rock and stumps;

ix. construction or demolition materials (as defined herein) – other than the exception as allowed under the definition of "clean-up waste" in this Bylaw;

x. septic tank pumping's, raw sewage or industrial sludge;

xi. radioactive materials;

xii. all passenger tires up to 62.0 cm (24.4 inches) as per the Tire Management Program with the Resource Recovery Fund Board of Nova Scotia;

xiii. industrial waste from factories or manufacturing processes;

xiv. manure, kennel waste, excreta, and fish processing waste but excluding pet litter, pet waste, and diapers;

xv. lead-acid automotive batteries and propane tanks;

xvi. waste which has been placed for collection but not in accordance with the provisions of this Bylaw;

xvii. materials including, without limiting the generality of the foregoing, liquid wastes banned from landfill disposal by the N.S.E. Regulations Respecting Solid Waste-Resource Management, November, 1995, as amended – other than recyclable materials or organic materials from eligible premises; and

xviii. other materials or solid waste as may be identified as unacceptable for municipal collection by the Town, including but not restricted to waste or material identified as non-collectible waste in public education documents distributed by the Town from time to time or referred to in the collection calendar or on the Town website;

z) "non-recyclable paper" means used napkins or paper towel, used fast food wrappers, wax paper, soiled pizza or other take-out food boxes, used paper plates or paper cups, damp or soiled newspaper or flyers, sugar, flour & potato paper bags or other similar items;

aa) "**N.S.E.**" means that department of the Nova Scotia Provincial Government currently called "Nova Scotia Environment" or its successor provincial department should there be a name change;

bb) "**occupant**" means any person who, in addition to or instead of the owner, resides in or occupies or is the lessee of, whether by way of verbal or written lease or other arrangement, a building or on a property located within the Town and includes any assignee or legal representative of same;

cc) "**organic materials**" means food waste (as defined herein), leaf and yard waste (as defined herein), non-recyclable paper (as defined herein), ashes or soot, sawdust (except fine dry sawdust), wood chips, wood shavings and other specific material of plant or animal origin as designated by Council from time to time;

dd) "**owner**" refers to the owner of property and includes a part owner, joint owner, tenant in common or joint tenant of the whole or any part of land or a building; a mortgagee in possession or a person having the care or control of the land or building; and, in the case of the absence or incapacity of the person having title to the land or building, a trustee, an executor, a guardian, and an agent, and, in the absence of proof to the contrary, the person assessed for the property;

ee) "**paper recyclables**" means non-soiled mixed paper, corrugated cardboard, boxboard (as defined herein), newsprint, magazines, catalogues, flyers, telephone and other soft cover books, file folders – both traditional and expandable, envelopes (other than padded or bubbled envelopes), non-metallic wrapping paper and paper egg cartons or other similar items as are designated by Council from time to time;

ff) "**Non-Transparent Bag**" means an opaque bag (black or green in colour) containing "residual waste" which has been placed for collection subject to special requirements elsewhere in this Bylaw;

gg) "**recyclables**" means paper recyclables and blue bag recyclables – both as defined herein;

hh) "**regulation container**" means a container, bag or bundle which meets the specifications and other requirements for same – in relation to specific waste types – as outlined elsewhere in this Bylaw;

ii) "**rejected waste**" means any type of waste which has been placed for collection but not in accordance with the provisions of this Bylaw and which has had a rejection sticker affixed thereto or has been otherwise rejected by the Town or its designated agent;

jj) "**residual waste**" means collectible waste other than organic materials (as defined herein) and recyclables (as defined herein) including without restricting the generality of the foregoing, broken bottles, crockery and glassware – subject to special requirements elsewhere in this Bylaw – and floor sweepings (except fine dry sawdust), pet litter, pet waste, light bulbs, disposable diapers, discarded clothing and furnishings, soiled mixed paper, broken toys, mats and small carpets, non-recyclable plastic, non-recyclable packaging including styrofoam and padded or bubbled envelopes, metallic wrapping paper, non- passenger tires, non- repairable household waste [but not including any household hazardous waste (as defined herein) or other non-collectible waste (as defined herein)];

kk) "**solid waste**" means collectible waste, non-collectible waste, all as defined herein and any other waste or discarded tangible personal property but excludes wastes from any industrial activity regulated by way of an approval under the Environment Act;

ll) "**Town**" means the Town of Lunenburg;

mm) "**Town Engineer**" means the person appointed as the Town Engineer for the Town of Lunenburg and includes any person acting under the supervision and direction of the Town Engineer;

nn) "**white goods**" means any large household appliance including but not limited to stoves, dishwashers, washers, dryers, hot water heaters, refrigerators, freezers, dehumidifiers and air conditioners" – the last four (4) being subject to special requirements elsewhere in this Bylaw and it is recommended that any Freon or other refrigerant gas, coolant or CFC be removed before being placed for collection.

COLLECTION:

3) Regularly scheduled collection from eligible premises of recyclables subject to restrictions noted elsewhere in this Bylaw shall take place once every two (2) weeks commencing at 6:00 a.m.

4) Regularly scheduled collection from eligible premises of organic materials, and residual waste [and either one bulky waste item (other than a clear bag) or one additional clear bag of residual waste as a bulky waste item], subject to restrictions noted elsewhere in this Bylaw – shall take place on the alternating week commencing at 6:00 a.m. The Town may in its discretion (which will be noted on the collection calendar) collect organic materials every week during July and August.

5) The alternating bi-weekly nature of the two above-mentioned collections results in a collection of some type(s) of collectible waste once a week.

6) When a normally scheduled collection day falls on a public or statutory holiday, such collection shall be made instead on a date as identified in the Town's collection calendar, unless otherwise specified by the Town Engineer.

7) Collection of natural Christmas trees, subject to the restrictions noted elsewhere in this Bylaw, shall take place annually in the month of January on a date to be specified by the Town Engineer or as noted on the collection calendar.

8) The dates for collection of collectible waste from eligible premises will be as described in a collection calendar, which will also be posted on the Town's website.

PLACEMENT:

9)

a) All solid waste to be collected by the Town (including waste from eligible premises on a private road) shall be accessible to the collector within 3.0 meters (9.8 feet) of the curb or travelled portion of the adjacent public street (or adjacent private road, as the case may be) and placed in such a manner as to not interfere with pedestrian traffic and snow removal.

b) Green carts must be placed at the curb (or edge of the travelled portion of the street or private road) in an upright position with the lid closed and the front of the cart facing the street, road or highway.

Notwithstanding the foregoing provisions of this section 9, all solid waste to be collected shall be placed so as not to obstruct the travelled portion of the street or the sidewalk (or the adjacent private road, as the case may be).

c) Persons may only place solid waste for collection in the public street directly abutting the property that generated the solid waste.

10) All regulation or other containers of solid waste placed out to be collected by the Town shall also be placed in an upright position and, in applicable circumstances, with the lid securely closed.

11) The Town Engineer may designate places for collection of solid waste within manufactured home parks.

CONTAINER REGULATIONS FOR RESIDUAL WASTE:

12) Residual Waste Bag Container Specifications:

a) Each bag (other than the Non-Transparent Bag Privacy Bag) shall be made of clear transparent (free from colour) plastic, be watertight and be securely tied;

b) Each bag shall be no smaller than 66.0 cm x 91.4 cm (26.0 inches x 36.0 inches) and no larger than 76.2 cm x 121.9 cm (30.0 inches x 48.0 inches);

c) Each bag shall have an overall length of between 0.5 meters (1.6 feet) and 1.2 meters (3.9 feet) when empty; and

d) Each bag, including contents, shall not exceed 25.0 kilograms (55.1 pounds) in weight.

13) Non-Transparent Bag Specifications

a) Each bag shall be made of opaque (black or dark green) plastic, be watertight and be securely tied;

b) Each bag shall be no smaller than 66 cm x 91.4 cm (26.0 inches x 36.0 inches) and no larger than 76.2 cm x 121.9 cm (30.0 inches x 48.0 inches);

c) Each bag shall have an overall length of between 0.5 meters (1.6 feet) and 1.2 meters (3.9 feet) when empty; and

d) Each bag, including contents, shall not exceed 25.0 kilograms (55.1 pounds) in weight.

14) Other Residual Waste Container Specifications

No person shall place, or caused to be placed, residual waste out for collection in any container other than a "regulation container" which is one which meets the following specifications:

a) Regulation containers shall be made of metal, plastic or other impermeable material;

b) Regulation containers shall be watertight, secured with a cover, equipped with handles in good repair and as large or larger at the top as they are at the bottom;

c) Regulation containers shall not be filled above a level 5 cm (2.0 inches) below the top of the container;

d) Each regulation container, including contents, shall not exceed 25 kilograms (55.1 pounds) in weight;

e) Each regulation container shall not exceed 100 liters (105.7 quarts) in volume;

f) Regulation containers shall be maintained in a neat and sanitary condition and kept in good repair; and

g) All waste in a regulation container must be bagged in a clear or Non-Transparent Bag (as authorized in this Bylaw) so that it may be inspected by the collector or other inspector engaged by the Town.

CONTAINER REGULATIONS FOR RECYCLABLES:

15) No person shall place, or caused to be placed, recyclables out for collection in any container other than a "regulation container" which is a bag which meets the following specifications:

Blue Bag Recyclables:

a) Each bag shall be watertight, securely tied and of transparent blue plastic;

b) Each bag shall also be no smaller than 25.0 cm x 40.0 cm (9.8 inches x 15.7 inches) and no larger than 75.3 cm x 120.0 cm (29.62 inches x 47.2 inches); and

c) Each bag, including contents, shall not exceed 25 kilograms (55.1 pounds) in weight; and

d) All recyclables must be clean.

Paper:

e) Each bag shall be a plastic opaque bag (such as a grocery bag) or a transparent clear plastic bag;

f) Each bag shall be made of plastic, be watertight and be securely tied;

g) Each bag shall be no smaller than 25.0 cm x 40.0 cm (9.8 inches x 15.7 inches) and no larger than 75.3 cm x 120.0 cm (29.62 inches x 47.2 inches); and

h) Each bag, including contents, shall not exceed 25 kilograms (55.1 pounds) in weight.

CONTAINER REGULATIONS FOR ORGANIC MATERIALS:

16) No person shall place, or cause to be placed, organic materials out for collection in any container other than a "regulation container" in the form of a green cart.

17) Notwithstanding section 16 hereof, special container requirements are applicable for leaf and yard waste as described under PREPARATION of SPECIFIC WASTE below and there are specific controls on natural Christmas trees under COLLECTION OF NATURAL CHRISTMAS TREES below.

COMMERCIAL CONTAINERS SPECIFICATIONS:

18) Commercial containers shall:

a) Be sturdily constructed of weather-proof material and shall be water tight;

b) Be inaccessible to pests, rodents, vermin, seagulls or animals;

c) Be equipped with a tight fitting lid with a positive closing device which shall be kept closed except when the container is being loaded or unloaded;

d) Be kept in a clean manner and in a sanitary condition;

e) Be kept in a state of good repair;

f) Have displayed thereon the name and telephone number of the owner of the container and the type of material to be deposited therein;

g) Have displayed thereon the following message "GARBAGE" or "LANDFILL", where institutional, commercial or industrial waste is to be deposited in the commercial container;

h) Have displayed thereon the following message "RECYCLABLES", where blue bag recyclables are to be deposited in the commercial container;

i) Have displayed thereon the following message "PAPER" or "CARDBOARD", where fiber recyclables are to be deposited in the commercial container; and

j) Have displayed thereon the following message "ORGANICS", where organic materials are to be deposited in the commercial container.

PREPARATION of SPECIFIC WASTES

Leaf and Yard Waste

19) Leaf and yard waste may be deposited into a green cart so long as the cover of same is completely closed.

20) Leaf and yard waste may also be deposited into paper bags.

21) Branches and limbs or brush, of a maximum length of 900.0 mm (3.0 feet) and maximum individual diameter of 50.0 mm (2.0 inches) may be tied in manageable bundles or inserted into bags as outlined above and outlined under Collection of Leaf and Yard Waste later in this Bylaw.

Bottles or Glassware

22) Broken bottles and glassware shall be sealed in a cardboard box or bucket or other non-bag container and clearly identified– by noting, in large capital letters, on the outside of the bundle the words "BROKEN GLASS" – a warning to collection personnel.

Ashes or Soot

23) Ashes or soot shall be completely cooled for a minimum of two (2) weeks, dampened down and placed in paper bags folded over and clearly marked as ashes for collection on compost collection day.

Cardboard

24) Corrugated cardboard shall be flattened out and securely tied in convenient bundles weighing no more than 25.0 kilograms each (55.1 pounds) and being a maximum of 900.0 mm by 600.0 mm (3.0 feet x 2.0 feet) in area and no more than 600.0 mm (2.0 feet) thick.

GREEN CARTS:

25)

a) Every owner or occupant shall provide sufficient and specified green carts for the storage and disposal of organic waste generated from his or her premises and maintain such green carts in good repair and sanitary condition. Those green carts shall remain the property of the said owner or occupant.

b) Notwithstanding subsection 25(a), the Town at its discretion, may supply green carts to newly constructed buildings. Any green carts distributed by the Town (whether before or after the passage of this Bylaw) shall remain the property of the Town and shall remain at the premises for which the green cart was supplied. The owner and the occupant of the premises shall maintain the said green cart supplied by the Town, and if requested by the Town, shall replace same.

26) To comply with the preceding section a green cart shall be:

a) of 120-litre or 240-litre capacity;

b) either of the aerated or ventilated type;

c) dark green in colour;

d) manufactured by SSI Schaefer or Town approved equal; and

e) designed to be emptied by a hydraulic lifting device.

27) Every owner or occupant of the following types of dwellings shall provide the number of green carts as outlined below. In all cases the building owners are to ensure adequate number of green carts is provided.

a) single-unit building	I green cart per dwelling unit (140 or 240 litre
b) 2 unit building	1 green cart per each unit (140 litre or 240 litre
c) buildings of 3 to 5 units	2 green carts per building (240 litres
d) buildings of 6 to 10 units	3 green carts per building (240 litre)
e) buildings of 11 to 20 units	4 green carts per building (240 litre)

f) building of over 20 units — 5 green carts per building (240 litre)

g) senior's apts. of more than 20 units — 5 green carts per building (240 litre)

RESTRICTIONS:

28)

a) No person shall place, or cause to be placed, residual waste per any one eligible premises out for collection on any one collection day the cumulative weight of which, including containers, exceeds 100.0 kilograms (220.5 pounds) excluding bulky waste items.

b) No person shall place, or cause to be placed recyclables per any one eligible premises out for collection on any one collection day the cumulative weight of which, including containers, exceeds 100 kilograms (220.5 lbs.)

29) No person shall place, or cause to be placed, leaf and yard waste from any one eligible premise out for collection on any one collection day which exceeds a maximum of six (6) bags and/or bundles.

30) No person shall place, or cause to be placed, residual waste from any one eligible premise out for collection on any one collection day which exceeds a maximum of six (6) bags excluding bulky waste items.

31)

a) No person shall place, or cause to be placed for collection more green carts per any one dwelling unit than the number prescribed in section 27 above on any one collection day and the combined weight of a cart and its contents shall not exceed 110 kilograms (242.5 lbs.).

b) No person shall place or cause to be placed for collection more than one (1) green cart per any eligible premise which is not a dwelling unit on any one collection day and the combined weight of a cart and its contents shall not exceed 110 kilograms (242.5 lbs.).

32) Solid waste placed for collection:

a) shall not exceed 150 kilograms (330.7 lbs.) in total excluding green carts and bulky waste as set out herein per each eligible premise per week;

b) shall not exceed 2 cubic meters in total volume excluding green carts and bulky waste per each eligible premise per week;

c) shall not exceed a length of 900 mm (35.4 inches) for any single, individual piece of solid waste with the exception of bulky waste; and

d) for bulky waste shall not exceed 100 kilograms (220.5 lbs.) in total.

33) No person shall place, or cause to be placed, more than one (1) Non-Transparent Bag per any one eligible premise out for collection on any one collection day for residual waste.

34) No person shall place, or cause to be placed, residual waste out for collection on any one collection day in a "storage" container which is not a clear transparent bag, free from colour, in which its contents are not visible (except for authorized Non-Transparent Bags as outlined elsewhere in this Bylaw), provided that the bag may be placed inside a regulation container as referred to in Section 14 of this Bylaw.

35) Non-Transparent Bags

a) Notwithstanding Sections 33 and 34, residents who require more than one Non-Transparent Bag in order to dispose of medical and/or health related waste may make application to the Town Engineer by Application Form attached as Schedule A hereto, and the Town Engineer after considering the necessity therefor, may grant the resident approval to place, or cause to be placed, a greater number of Non-Transparent Bags per any one dwelling unit out for collection on any one collection day for a period of up to 2 years;

b) No person from that dwelling unit shall place, or cause to be placed, out for collection on any one collection day a greater number of Non-Transparent Bags than were authorized, upon application, by the Town Engineer.

c) No person shall place in a Non-Transparent Bag anything proscribed in the application form or in the approval granted by the Town Engineer

36) Notwithstanding Sections 33 and 34:

a) If a business has a public waste container on its property for mixed waste brought onto the premises by customers (and not generated on the premises) the owner or occupant may make application to the Town Engineer by Application Form attached as Schedule B hereto for the placement of additional Non-Transparent (black or dark green) plastic bag(s) for collection. The Town Engineer upon such Application, and after considering the necessity therefor, may grant the business approval to place or cause to be placed for collection on any one collection day, one (or a greater number) of Non-Transparent (black or dark green) plastic bags for mixed waste in addition to the Non-Transparent Bag authorized under this Bylaw.

b) No person from that business shall place or cause to be placed out for collection on any one collection day a greater number of mixed waste Non-Transparent (black or dark green) plastic bags than were authorized upon Application by the Town Engineer.

c) No person shall place in any such mixed waste bag anything proscribed in the Application Form or in the approval granted by the Town Engineer.

REJECTION OF WASTE:

37) Any type of waste which has been set out for collection is subject to inspection by the Town or its designated agent and any such waste found or deemed by same to be set out in violation of the requirements of this Bylaw may be rejected and not collected.

38) Any waste which is so rejected may have placed on it a Rejection Sticker indicating the reason or reasons for rejection and information as to how to rectify same or get direction to rectify the problem, (although the Town or any person designated by it may otherwise reject solid waste without affixing a rejection sticker).

39) Any rejected waste shall remain the property of the owner or occupier, and shall be disposed of as permitted by this Bylaw.

PROHIBITIONS SPECIFIC TO COLLECTIONS:

40) No person shall place, or cause to be placed, any collectible waste out for collection before 6:00 pm of the day immediately preceding the day scheduled for collection of that solid waste stream.

41)

a) No person shall place, or cause to be placed, any collectible waste out for collection after 6:00 a.m. of the day scheduled for collection.

b) Any waste placed out for collection after 6:00 a.m. may not be collected if the collection contractor has already passed that property.

c) If any waste is placed out for collection after 6:00 a.m. and it is not collected by the collection contractor, it shall be removed from the public street and properly stored on the private property from which the waste originated.

42) The two immediately preceding sections may be altered by written permission of the Town Engineer.

43) No person shall permit any empty or rejected regulation container or any rejected materials or waste to remain at the collection placement spot after 12:00 noon of the day following the day scheduled for collection.

44) No person shall place, or cause to be placed, any non-collectible waste out for collection.

45) No person shall place any garbage box or other container for holding waste between collection days on a street right-of-way.

COLLECTION OF BULKY WASTE:

46) No person shall place, or cause to be placed, bulky waste out for collection except in accordance with the following restrictions:
    a) It is recommended that any Freon or other refrigerant gas, coolant or CFC be removed from a refrigerator, freezer, dehumidifier or air conditioner prior to being placed out for collection and any refrigerator or freezer shall have its doors already removed.

47) No person shall place, or cause to be placed, bulky waste out for collection except in accordance with the following restrictions:

    a) such waste, when consisting of more than one article, shall be packaged, bundled or boxed so as to facilitate removal and handling in order to constitute one item; and

    b) the individual package, bundle or box shall not exceed 100 kilograms (220.5 lbs.) in weight; and

    c) the individual package, bundle or box shall not exceed 1.8 meters (5.91 feet) in any dimension.

48) No person shall place, or cause to be placed, bulky waste out for collection on any one day the total of which exceeds 2.0 m^3 in total volume.

49) No person shall permit any rejected waste to remain at the collection placement spot after 12:00 noon of the day immediately following the day designated by the Town Engineer for collection of same.

SPECIAL PROVISIONS FOR LEAF AND YARD WASTE:

50) No person shall place, or cause to be placed leaf and yard waste out for collection except on a day designated for organic waste and in accordance with the following restrictions:

    a) if not in a green cart, such waste shall (save for bundled branches/ limbs) be contained in securely tied paper bags of a dimension no less than 66.0 cm by 91.0 cm (26.0 inches by 36.0 inches) nor greater than 76.2 cm x 121.9 cm (30.0 inches x 48.0 inches) and shall not exceed a weight of 25.0 kg (55.1 pounds);

    b) bundled branches/limbs not exceeding 900.0 mm (3.0 feet) in length with individual limbs not exceeding 50 mm (2 inches) in diameter;

    c) each bag or bundle shall not exceed a weight of 25.0 kg (55.1 pounds); and

    d) the total of such waste shall not exceed 2.0 cubic meters (2.6 cubic yards) in total volume.

COLLECTION OF NATURAL CHRISTMAS TREES:

51) No person shall place, or caused to be placed, a natural Christmas tree out for collection except on a day designated by the Town Engineer for collection of same and in accordance with the following restrictions:

    a) It is to be unpackaged and undecorated, including the removal of all lights and any tree stand;

    b) It shall have no wires or nails attached; and

    c) It must not exceed 3.0 meters (9.8 feet) in length.

52) No person shall place, or cause to be placed, any natural Christmas tree out for collection before 6:00 pm of the day immediately preceding the day designated by the Town Engineer for collection of same.

53)

    a) No person shall place, or cause to be placed, any natural Christmas tree out for collection after 6:00 AM of the day designated for collection of same.

    b) Any natural Christmas tree placed out for collection after 6:00 a.m. may not be collected if the collection contractor has already passed that property.

    c) If any natural Christmas tree is placed our for collection after 6:00 a.m. and it is not collected by the collection contractor, it shall be removed from the public street and properly stored on the private property from which the Christmas tree waste originated.

54) No person shall permit any rejected natural Christmas tree to remain at the collection placement spot after 12:00 noon of the day immediately following the day designated for collection of same.

RESPONSIBILITIES OF OWNERS and OCCUPANTS:

55) Every owner and occupant shall:

    a) Ensure that collectible waste and clean-up waste is placed for collection in accordance with this Bylaw;

    b) Use only regulation containers for the storing and placement for collection of collectible waste;

    c) Provide a sufficient number of regulation containers to contain all of the collectible waste generated at the subject premises between regularly scheduled collection dates;

    d) Maintain such regulation containers in good repair, and in a clean and sanitary condition;

e) Take all reasonable measures to ensure that each regulation container is covered and secured

f) at all times except when being emptied or filled;

g) Clean up any type of collectible waste which has escaped from its container, package, bundle or box, (and any Clean-Up Waste which has escaped from its container, package, bundle or box) – whether it be a regulation container or not;

h) If collectible waste is stored outside the main building on the eligible premises it is to be stored in one or more secured regulation containers or an approved storage bin – in either case made inaccessible to pests, rodents, vermin, seagulls or animals;

i) Ensure that any approved storage bin serving that premise is maintained at all times in a neat and sanitary condition and in good repair;

j) Store any waste refrigerator or freezer either inside an enclosed and locked building or with the doors of the refrigerator or freezer removed;

k) Ensure the proper preparation of all collectible waste in accordance with this Bylaw; and

l) Abide by all lawful directives of the Town, or designated agents with regard to the handling of solid waste materials.

COMMERCIAL CONTAINERS:

56) The owner or occupier of any premises on which a commercial container is placed shall keep each commercial container behind, or beside, the building which it serves so as to reduce visibility from the street and adjacent properties.

57) Where the commercial container is placed on premises which are located in a residential zone pursuant to the Town's Land Use Bylaw or adjacent to a property which is zoned residential or contains a residential use, the commercial container shall be kept not less than 3.0 meters (9.8 feet) from the adjacent property lines.

58) Where the owner or occupier of any premises is unable to comply with the requirements of the two (2) immediately preceding sections because of the location of a building on the premises, which building was in existence at the time of the adoption of this Bylaw, the owner or occupier shall keep the commercial container at a location on the premises which is considered by the Town Engineer to not be unsightly and to cause neither a nuisance nor a health related problem.

59) Any temporary commercial container used during construction or repair work shall be subject to the following requirements:

a) no solid waste shall extend beyond the internal volume of the container;

b) the temporary commercial container shall be removed immediately upon completion of the construction or repair work; and

c) the temporary commercial container shall be emptied as often as required to avoid over-filling of the same.

60) An owner or occupier of any premises on which a commercial container is located shall not permit the commercial container to be loaded other than uniformly and ensure that no solid waste extends beyond the internal volume of the container.

61) An owner or occupier of any premises on which a commercial container is located:

a) shall place same only on a surface which is hard, level and weather-resistant;

b) shall keep the area surrounding the container free from litter and waste; and

c) shall cause the container to be emptied on a regular basis, as required.

62) Where a person proposes to locate a temporary commercial container within the right of way of a public street in the Town, that person shall submit a request for doing so, to the Town Engineer, outlining the exact proposed location and the estimated time that the container will be required to be there and any other details as requested by the Town Engineer. The person must receive permission from the Town Engineer, outlining the exact location to be used, and other salient details, and agree to pay a fee set by Resolution of Council if parking spaces are impeded, prior to so locating a commercial container.

HAULERS:

63) All private collections of solid waste shall be undertaken in compliance with relevant Federal/Provincial/Municipal statutes and regulations.

64) All private collection vehicles shall:

a) be maintained in good condition and be properly manned and equipped to ensure safe collection of solid waste;

b) comply with the Motor Vehicle Act and any other regulations or legislation in effect from time to time;

c) be designed so as to prevent any contents (including liquids) from falling out, being spilled, or scattering from the vehicle whether in motion or not;

d) if used in the collection of more than one type of waste, be constructed to prevent cross-contamination between the various waste streams;

e) be equipped with a tailgate or other restraining device; and

f) be closed-in or equipped with a tarpaulin or equivalent cover device which shall be used to cover solid waste while it is being transported.

65) All private collection of any solid waste shall be made directly to the private collection vehicle from the premises where the same was generated.

66) All solid waste collected through private collections, and which is to be delivered to a solid waste management facility, including but not limited to Kaizer Meadow, shall be in compliance with the Regulations promulgated by the operator of that site, regarding acceptance and receipt of solid waste at that site.

67) In the event of any spillage, the vehicle operator shall be responsible for the clean-up which shall be undertaken immediately.

DESIGNATED ELECTRONIC PRODUCTS:

68) No person shall place designated electronic products out for collection.

69) Every owner or occupant may deliver designated electronic products to a recognized electronics return collection facility in Nova Scotia for reuse or recycling.

HOUSEHOLD HAZARDOUS WASTE:

70) Every owner or occupant shall store any residentially-generated household hazardous waste in a safe and secure manner and place and shall deliver same, as soon as is reasonably possible, to the Household Hazardous Waste Depot ("HHW Depot") at Kaizer Meadow, (or to any other approved Household Hazardous Waste Depot which will accept same).

71) No person shall dispose of, or cause or permit the disposal of, household hazardous waste at any location within the Town.

CONSTRUCTION OR DEMOLITION MATERIALS:

72) Every owner or occupant shall deliver any construction or demolition materials – over and above those collected by the Town – to the appropriate area or site within Kaizer Meadow or an approved C&D debris disposal site.

73) No person shall dispose of construction or demolition materials by stock-piling, storing or any other method.

KAIZER MEADOW ENVIRONMENTAL MANAGEMENT CENTRE:

74) The Town Council has designated the Kaizer Meadow Environmental Management Centre ("Kaizer Meadow") as the receiving site for solid waste generated by its residents, within the restrictions as set in this Bylaw and other restrictions as set by the operator of Kaizer Meadow.

75) The operator or other authorized staff of Kaizer Meadow may refuse to accept a load of solid waste for the following reasons:

    a) solid waste other than that which Kaizer Meadow has been approved to accept; or

b) it is a load for which a tipping fee, whether set or negotiated, has not yet been paid to Kaizer Meadow; or

c) it is a load for which tipping fee payment arrangements satisfactory to the operator or other Kaizer Meadow authorized staff have not yet been agreed to, reduced to writing and signed by both parties.

76) No person shall dispose of, or cause or permit the disposal of, any type of solid waste outside, around or adjacent to Kaizer Meadow in the following circumstances:

a) when Kaizer Meadow is not open and operational; or

b) after the operator or authorized staff of Kaizer Meadow has refused to accept same.

77) All collection vehicles shall be equipped with a tailgate or other restraining device; and be closed-in or equipped with a tarpaulin or equivalent cover device which shall be used to cover solid waste while it is being transported from Kaizer Meadow front gates to the scale house.

LEGAL and ILLEGAL DISPOSAL:

78) With the exception of the placement of solid waste for collection in accordance with this Bylaw, and the delivery of designated electronic products or household hazardous wastes to depots or other disposals allowed for in this Bylaw, no person shall dispose of, or cause or permit the disposal of, collectible waste, clean-up waste or non-collectible waste at any location or manner in the Town except as follows:

a) backyard composting carried out in such a manner as to not constitute a nuisance;

b) subject to Federal or Provincial law to the contrary, the disposal of waste trees, brush or portions thereof or other organic farm or forestry waste on privately-owned forest or farm land in such a manner as to not constitute a nuisance;

c) subject to Federal or Provincial law or other Municipal Bylaws to the contrary, the disposal of aggregate, soil, bricks, mortar, concrete, asphalt pavement, porcelain or ceramic materials as fill in such a manner as to not constitute a nuisance.

79) No person shall dispose of, or cause or permit the disposal of, any solid waste in an approved storage bin unless that person is, or has the permission of, the owner of said bin and the bin is located on the property where the waste is generated.

80)

a) No person shall dispose of, or cause or permit the disposal of, any non-collectible waste or rejected solid waste on another private property or on public property.

b) No person shall dispose of or cause or permit the disposal of non-collectible waste within the Town.

c) waste shall be stored on the property where it was generated.

81) No person shall dispose of, or cause or permit the disposal of, construction or demolition materials at any location other than at Kaizer Meadow or an approved C&D debris disposal site.

82) Proof that any type of solid waste, which was disposed of in contravention of this Bylaw, originated from a particular person, from the residence of a particular person, or from a particular premise shall, in the absence of evidence convincing a court to the contrary, be evidence sufficient for a court to infer that the said person – or the owner or current occupant of said residence or premises– was the person who disposed of that solid waste, or a portion of same, or caused or permitted it to be disposed of.

GENERAL PROHIBITIONS:

83) Where an owner or occupier properly places any authorized form of solid waste out for collection by the Town's contractor the said solid waste becomes the property of the Town.

84) No person shall pick over, remove, collect, disturb or otherwise interfere with any type of solid waste or regulation container which has been placed out for collection.

85) No person shall pick over, remove, collect, disturb or otherwise interfere with any type of solid waste or regulation container which has been placed in an approved storage bin.

86) The prohibitions in the immediately preceding three sections do not apply to the following circumstances:

a) removal by authorized personnel when acting on behalf of the Town; or

b) waste wood material, appliances or furniture,; and any other materials placed out as bulky waste items;

c) leaf and yard waste.

87) In the event of any removal, collecting or disturbing by any person as authorized by the immediately preceding section, all remaining materials shall be left by that person in an orderly condition and placed so as to not interfere with pedestrian or vehicular traffic.

88) No person shall dispose of any type of solid waste by the burning of same.

89) No person shall place any solid waste generated from outside the Town for collection within the Town.

ENFORCEMENT and PENALTIES:

Illegal Dumping

90) Any person who disposes of, or permits the disposal of, any solid waste other than in accordance with this Bylaw is guilty of a summary offense and is liable, upon conviction, to a fine

of not less than Two Hundred Dollars ($200.00) and not more than Five Thousand Dollars ($5,000.00), and in default of payment to a term of imprisonment not to exceed ninety (90) days.

Other Provisions

91) Any person who violates any other provision of, or permits any other thing to be done in violation of, this Bylaw is guilty of a summary offense and is liable, upon conviction, to the following:

    a) for a first offense, a fine of not less than Two Hundred Dollars ($200.00) and not more than One Thousand Dollars ($1,000.00) and in default of payment thereof to a term of imprisonment not to exceed thirty (30) days;

    b) for a second offense, a fine of not less than Three Hundred Dollars ($300.00) and not more than Two Thousand Dollars ($2,000.00) and in default of payment thereof to a term of imprisonment not to exceed sixty (60) days;

    c) for each subsequent offense, a fine of not less than Five Hundred Dollars ($500.00) and not more than Five Thousand Dollars ($5,000.00) and in default of payment thereof to a term of imprisonment not to exceed ninety (90) days.

92) Any person who obstructs or hinders any person in the performance of their duties under this Bylaw is guilty of a summary offense and is liable, upon conviction, to a fine of not less than Two Hundred Dollars ($200.00) and not more than Five Thousand Dollars ($5,000.00), and in default of payment to a term of imprisonment not to exceed ninety (90) days.

93) Where a person is convicted of an offence under this Bylaw and the court is satisfied that, as a result of the commission of the offence, clean-up or site remediation costs were incurred, whether by the Municipality or by a person, the Court may order the offender to pay, in addition to all other fines and penalties, restitution to the Municipality or person in an amount equal to the said clean-up or remediation costs.

94) Pursuant to the provisions of the Municipal Government Act, in addition to a fine imposed for a violation of this Bylaw a judge may order the imposition of a penalty in relation to any fee, cost, toll, or charge associated with the conduct that gave rise to the offence.

95) Pursuant to the provisions of the Municipal Government Act, in addition to a fine imposed for violation of this by-law a judge may order compliance with this Bylaw within a specified time.

96) Each day that a person commits any offence under this Bylaw constitutes a separate offence.

97) Where a breach of this Bylaw is anticipated or is of a continuing nature, the Town may, pursuant to the provisions of the Municipal Government Act, apply to a judge of the Supreme Court of Nova Scotia for an injunction or other order and the judge may make any order that is appropriate under the circumstances.

ADMINISTRATIVE TICKETING:

98) In lieu of prosecution under this Bylaw the Town or its designated agent may issue to any person it believes, upon reasonable grounds, has committed an offence under this Bylaw a Notice of Alleged Violation allowing the person to whom it is directed to avoid possible prosecution by means of the voluntary payment of a sum of money.

99) Any person who receives a Notice of Alleged Violation in relation to this Bylaw and where the said Notice so provides, may pay a penalty in the amount of One Hundred Dollars ($100.00) to the office of the Town Clerk provided that said payment is made within fourteen (14) days of the date of issuance of the Notice and said payment shall be in full satisfaction thereby releasing the person named from prosecution for the said alleged violation.

100) Nothing in this Bylaw requires the Town to issue a Notice of Alleged Violation in lieu of initiating a prosecution in relation to an alleged violation.

MEASUREMENTS

101) All measurements in this Bylaw are given in metric, which shall govern for the purposes of interpretation and enforcement of this Bylaw. Imperial measurements are included in parentheses for ease of reference only, and in some instances are only approximate.

REPEAL:

102) The existing Solid Waste Collection Bylaw# 38, of the Town of Lunenburg (and all amendments thereto) are hereby repealed.

Clerk's Annotation for Official Bylaw Books Date of first reading:

Date of advertising of Notice of Intent to Consider:

Date of second reading:

Advertisement date of Bylaw passage and effective date:

Mailing date to Department of Municipal Affairs three (3) certified copies of Bylaw:

I certify that this Solid Waste Management Bylaw was adopted by Council and published as indicated above.

_____ _____

Clerk Date

SCHEDULE A
Town of Lunenburg Additional
Non-Transparent Bag Application

Residents may apply for additional Non-Transparent bag(s) for wastes generated due to medical or health-related issues. Non-Transparent bag(s) used for this type of waste disposal should be opaque (black or dark green) plastic bags. Approved applicants will be permitted to place additional Non-Transparent bag(s) out for collection on their collection day. Additional Non-Transparent bag(s) must be approved before placing them at the curb for collection. A Privacy Bag application must be completed every two years for continued use of additional Non-Transparent bags.

Please provide the following information:

Resident Name:_____Resident Phone Number: _____

Resident's e-mail address: _____

Types of wastes to be placed in Non-Transparent bags(s):_____

Number of additional Non-Transparent bag(s) being requested: _____

Resident's Civic Address:_____

Are you the property owner? [ ] Yes [ ] No

If you are not the owner, please provide the following information:

Property Owner's Name _____
Property Owner's Phone Number:_____

Property Owner's e-mail address: _____

Date of Application: _____

Please return the completed form in one of the following ways:

By mail: Town of Lunenburg, PO Box 129, Lunenburg, Nova Scotia, BOJ 2C0,

Attention: Town Engineer, 902 634 8992.

(See: next page for additional information)

Please note of the following:

All wastes including organics, recyclables, garbage, paper and cardboard must be sorted correctly in accordance with the Town's Solid Waste Bylaw even if have been approved for additional Non-Transparent bag(s).

Garbage bags (clear or opaque) cannot contain:

- Saturated, blood-soaked gauze and dressings (excess blood must be squeezed from dressings into toilet/sink, once squeezed, dressings are placed a garbage bag)
- Fluid-filled or blood-filled medical tubing or dialysis tubing (fluids must be emptied into toilet/sink, once emptied, tubing is placed in a garbage bag)
- Sharps, needles and lancets for blood testing (return to pharmacy for disposal)
- All unused medications (return to pharmacy for disposal)

Hazardous wastes must be taken to the Household Hazardous Waste Facility at Kaizer Meadow Environmental Management Centre which is located at 450 Kaizer Meadow Road, Chester, Nova Scotia, as such wastes cannot be collected with regular garbage.

Note: Non-Transparent bag(s) are subject to inspection by the collection contractor or curbside waste inspector.

SCHEDULE B

TOWN OF LUNENBURG
MIXED WASTE BAG APPLICATION – PUBLIC WASTE ON BUSINESS PROPERTY

[Businesses may apply to the Town Engineer for approval to place mixed waste opaque (black or dark green) plastic bags out for collection where the business has a public waste container on its property for mixed waste brought onto the premises by customers (and not generated on the premises). **The use of mixed waste bags must be approved by the Town Engineer before placing them at the curb for collection.** A mixed waste bag application must be completed every two years for continued use of mixed waste bags.]

Please provide the following information:

Business Name:_____Business Phone Number _____

Business e-mail Address: _____

Types of wastes to be place in mixed waste bag(s):

_____

_____

Location of Container receiving public waste: _____

Number of Mixed Waste bag(s) being requested: _____

Business Civic Address: _____

Are you the property owner? [ ] Yes [ ] No

If you are not the owner, please provide the following information:

Property Owner's Name: _____
Property Owner's Phone Number: _____
Property Owner's e-mail address: _____

Name of occupant of premises: _____

Name of Applicant (owner and/or occupant) _____

Please return the completed form in one of the following ways:
By mail: Town of Lunenburg, PO Box 129, Lunenburg, Nova Scotia, B0J 2C0, Attention: Town Engineer.

Please note the following: Waste which is prohibited pursuant to the Bylaw may not be placed in a mixed waste bag(s).

TOWN OF LUNENBURG

BY-LAW NO. 5

A BY-LAW RESPECTING RULES GOVERNING THE TOWN COUNCIL

Short title

1.1 This by-law shall be known as and may be cited as the "Council Procedure By-law".

Apply to Council, committees and boards

2.1 In all the proceedings had or taken in the Council the following rules and regulations shall be observed and shall be the rules and regulations for the order and discharge of the business of the Council and mutatis mutandis of its committees, boards and commissions.

Organization of Council

3.1 At the first meeting after a general election of councillors, or so soon thereafter as practicable, the date of which meeting shall be fixed by the outgoing Council, the Council shall be organized by administering the required oaths, if not previously administered, and the appointment to any vacancies in the offices of the Deputy Mayor, committees, boards and commissions and the further business hereinafter provided.

Adjournment

4.1 The Council shall adjourn at the hour of twelve o'clock midnight if in session at that hour, unless otherwise determined by a vote of two-thirds of the councillors present.

Opening of meeting

5.1 At or so soon after the hour of meeting as there shall be a quorum present, the Mayor shall take the chair and call the meeting or order.

If Mayor absent

6.1 In case the Mayor does not attend within fifteen minutes after the time appointed, the Deputy Mayor shall call the councillors to order and if a quorum be present, shall preside over the meeting or until the arrival of the Mayor.

Deputy Mayor also present

7.1 In case neither the Mayor nor the Deputy Mayor is in attendance within fifteen minutes of he appointed time, the Town Clerk shall call the councillors to order if a quorum be present, and the councillors shall choose a chairman who shall preside over the meeting or until the arrival of the Mayor or the Deputy Mayor.

Lack of quorum

8.1 If there be no quorum present within one-half hour after the time appointed for the meeting, the Town Clerk shall take down the names of the councillors then present and the Council shall stand adjourned until the same appointed time of the next day not being a holiday; provided always, that if all councillors remain present until a quorum is made up the meeting may proceed with business as long as the quorum remains.

Minutes

9.1 Minutes of the proceedings of every meeting of the Council shall be drawn up and fairly entered by the Town Clerk in a book kept for that purpose or cause the same to be done and such book shall be properly indexed.

Contents of minutes

9.2 Such minutes shall:

9.2.1 contain all resolutions and motions passed, with the names of the movers and seconders; and

9.2.2 mention reports, petitions and other papers submitted to the Council by their respective titles only, or by a brief description of their purport except reports accepted by Council, which shall be entered at length or attached to the minutes.

Approval of minutes

9.3 Unless objection is taken to the minutes when read or as circulated, they shall be deemed approved and shall be signed by the chairman. If any objection is made to the minutes, the councillor making such objection shall state his grounds without comment and if the Council agrees the minutes shall be amended accordingly. If all the councillors do not acquiesce in the proposed amendment, the motion must be made and seconded to amend the minutes in accordance with the objection which shall then be debatable and resolved by Council.

Duties of presiding officer

10.1 The Mayor shall preserve order and decorum and decide questions of order, subject to an appeal to the Council and in the absence of the Mayor, the presiding officer shall have the same authority while so presiding as the Mayor would have if present.

11.1 When the Mayor is called upon to decide a point of order, practice or procedure the point shall be stated without unnecessary comment and the Mayor shall cite as far as able the rules or authorities applicable to the case.

Decision by majority

12.1 All questions arising in the Council or one of its committees, boards or commissions shall be decided by a majority of the votes of Council, or the committee, board or commission, including the Mayor or other presiding officer who shall have a right to vote on all such questions, and in the event of a tie the motion shall be deemed to have been lost.

Mayor leaving chair

13.1 If the Mayor decides to leave the chair for the purpose of taking part in debate or otherwise, he shall call upon the Deputy Mayor, or in his absence, a councillor, to fill his place and discharge his duties until he resumes the chair.

Councillor speaking

14.1 Every councillor previous to speaking on any question or motion, shall rise from his seat and shall address himself to the Mayor.

Recognition of councillor

15.1 When two or more councillors rise to speak, the Mayor shall name the councillor who in his opinion first rose from his seat, but a motion may be made that any councillor who has risen, "be now heard" or "do now speak" and if such motion is carried such councillor shall then be heard.

Every councillor to vote

16.1 Every councillor who is present when a question is put, shall vote thereon unless the Council excuses him therefrom or unless he is personally interested in the question, provided that such interest is resolvable into a personal pecuniary profit, or is peculiar to that councillor and not in common with the interests of the citizens or Council at large and in such case he shall not be required to vote.

No disturbance

17.1 When the Mayor is putting a question, no councillor shall walk across the room or make any noise or disturbance nor when any councillor is speaking shall any other councillor pass between him or the chair or interrupt him except to raise a point of order.

Councillor called to order

18.1 A councillor called to order from the chair, shall immediately sit down but may afterwards explain his conduct, and, if an appeal is taken to Council it shall decide the case but without debate. If there be no appeal, the decision of the Mayor shall be final.

No offensive language or action

19.1 No councillor shall use offensive words in or against the Council or any councillor nor shall he speak outside the question in debate nor resist the rules of Council or disobey the decision of the Mayor or of the Council upon any question of order or practice or upon the interpretation of the rules of the Council, and in case any councillor so resists or disobeys, he may be ordered by the Mayor by order or resolution of the Council to leave his seat for that meeting, and in case of his refusing to do so he may on order of the Mayor be removed therefrom by a policeman, but in case of an apology being made by the offender he may by vote of the Council be permitted forthwith to resume his seat.

Reading of question

20.1 Any councillor may require the question or motion in discussion to be read at any time during the debate but not so as to interrupt another councillor while speaking.

Length and number of speeches

21.1 No councillor shall speak more than once on the same question without leave of the Council except in explanation of a material part of his remarks which may have been misconceived, and in so doing he shall not introduce new material. A reply is allowed to a councillor who has moved an amendment. No councillor shall speak, without leave of the Council, to the same question or reply for longer than ten minutes.

Recorded vote

22.1 Upon division of the Council the names of those who voted for and the names of those who voted against the question shall be entered in the minutes when any councillor shall have so requested.

Separate propositions

23.1 When the question before Council contains two or more distinct propositions upon request of any councillor a vote upon each proposition shall be taken separately in such order as determined by the Mayor.

Declaration of vote

24.1 After a question is finally put by the Mayor no councillor shall speak to the question nor shall any other motion be made until after the result of the vote has been declared and the decision of the Mayor as to whether the question has been finally put shall be conclusive.

Contrary motion

25.1 Whenever the Mayor is of the opinion that a motion is contrary to the rules and privileges of Council he shall advise the councillors thereof immediately without putting the question and shall cite the rules and authorities applicable to the case without argument or comment. If there be no appeal to Council or if the chair is sustained or appeal taken to Council, the question shall not be put.

Point of order

26.1 Any councillor may rise and call to order another councillor. In so doing the councillor must state the point of order clearly and distinctly and the Mayor shall decide whether the point is well taken.

Appeal

27.1 An appeal may be taken from the decision of the Mayor by any councillor. When an appeal is taken to Council the Mayor shall first give the terms of his decision appealed from and add "The question is now, shall the decision of the chair stand as a decision of Council?"

Consideration of order decided first

28.1 When any question of order, procedure or practice is raised it must be decided before the question then in discussion is proceeded with.

Privilege

29.1 When any matter of privilege arises it shall be immediately taken into consideration.

Right to be heard

30.1 Every councillor shall be heard in his place touching any charges brought against him as councillor or on any motion by which his private interests may be affected, but such councillor may withdraw from the Council Chamber before the Council proceeds to consider or decide on such charge or motion.

Not to leave

31.1 The councillors shall not leave their places on adjournment until the Mayor leaves the chair.

31.2 No councillor shall leave the Council Chamber during the transaction of business without the permission of the Mayor.

Motions in writing

32.1 All motions save 34.1.1 to 34.1.6 inclusive as set forth in Section 34.1 shall be in writing if so required by the Mayor or any councillor and all motions shall be seconded before being debated or put by the chair.

Reading of motion

33.1 When a motion is read by the Mayor it shall be deemed to be in the possession of Council, but may, with the permission of Council, be withdrawn by the mover and seconder at any time before voting thereon or amendment.

Priority motions

34.1 When a question is under consideration no other motion shall be received unless it is a motion to:

34.1.1 adjourn,
34.1.2 lay on the table,
34.1.3 postpone to a certain time,
34.1.4 refer,
34.1.5 amend; or
34.1.6 move the previous question

34.2 The motions referred to in subsection 34.1 shall have precedence in the order in which they are named therein.

34.3 A motion to adjourn shall always be in order except,

34.3.1 when a councillor is in possession of the floor,

34.3.2 when a vote is being conducted,

34.3.3 when a motion to adjourn was the last preceding motion; provided that a motion to adjourn Council or the debate to a day certain shall not come within this rule.

Question be now put

35.1 A motion that the question be now put, until it is decided, shall preclude all amendments to the main question and shall be put without debate in the following words: "That the question be now put." If this motion is resolved in the affirmative the original question shall be put forthwith without any amendment or debate; but if the said motion is resolved in the negative then the main question is superseded and a new subject or motion must be submitted to Council.

No debate

36.1 The following questions shall be decided without debate or amendment:

36.1.1 a motion to reconsider,

36.1.2 a motion as to priority of business or as to the suspension of the general order of the day,

36.1.3 application to speak more than the prescribed number of times or longer than the prescribed times,

36.1.4 a motion to allow any person other than a councillor to address the Council,

36.1.5 the previous question,

36.1.6 a motion to adjourn,

36.1.7 a motion to postpone to a day certain,

36.1.8 a motion to lay on the table.

Motions not dealt with

37.1 All motions called in pursuance of the general order of the day and not disposed of shall be placed at the foot of the list, unless otherwise ordered by Council, but where any order, resolution or question shall be lost by the Council breaking up for want of a quorum the order, resolution or question so lost shall be the first business proceeded with and disposed of at the next meeting of Council under that particular head.

Amendments

38.1 Amendments shall be put in the reverse order to that in which they are moved. Every amendment submitted shall be reduced to writing, if required by the Mayor or any councillor, and shall be decided or withdrawn before the main question is put. Only one amendment is to be allowed to an amendment and any amendment more than one must be to the main question.

Strike out and insert

39.1 On an amendment to "strike out and insert" the paragraph to be amended shall first be read as it stands. Then the words proposed to be struck out shall be read; then those to be inserted shall be read; and finally the paragraph as it would stand if so amended shall be read.

Appointments

40.1 On all motions for the appointment of any person to any office in the gift of Council, the candidates for such office shall be voted on separately in the order in which they are proposed.

Extraordinary expenditures

41.1 All resolutions involving "extraordinary expenditure" or an expenditure not specifically provided for in the estimates, shall be laid on the table as a notice of motion to be discussed and decided at a subsequent meeting, and no such resolution shall be voted upon at the same meeting at which it is introduced unless the Council, by a two-thirds vote of the councillors then present, shall deem it expedient to do so.

Reconsideration

42.1 After any question has been decided either in the affirmative or negative any councillor may move for a reconsideration thereof, but no discussion of the main question shall be allowed unless reconsidered, and there shall be no reconsideration at any subsequent meeting unless notice of such reconsideration be given at the meeting at which the main motion is carried, and after such notice is given no action shall be taken by Council upon the main motion until such reconsideration is disposed of.

42.2 No question shall be reconsidered more than once nor shall a vote to reconsider be reconsidered.

General order of the day

43.1 The following shall be the general order of the day, subject however, to suspension by the Council at any meeting as the exigencies of business may require:

43.1.3 reading or considering the minutes as circulated of the last regular meeting and of any special meeting held since such meeting,

43.1.2 hearing of delegations or individuals,

43.1.3 correspondence and other original communications,

43.1.4 receiving of accounts and dealing with same,

43.1.5 reading of memorials and petitions,

43.1.6 notices of motion,

43.1.7 presentation and consideration of committee reports,

43.1.8 motions,

43.1.9 unfinished business,

43.1.10 questions by members,

43.1.11 new business.

Material for councillors

44.1 The Town Clerk shall prepare for the use of councillors at regular meetings of Council all matters that are to come before the Council in the sequence in which such matters appear in the general order of the day.

Order of business

45.1 Business shall be taken up in the order in which it stands upon the general order of the day.

Special meetings

46.1 For all special meetings of Council the Town Clerk shall prepare for councillors, under the direction of the Mayor, a memorandum of the principal business to be transacted at any such meeting.

Petitions, etc.

47.1 Every petition, remonstrance or other written application to be presented to Council must be plainly written and signed.

Petition to be examined

47.2 Every such petition, remonstrance or written application must be presented to Council by a councillor or the Town Clerk, who shall examine the same and be answerable that it does not contain any impertinent or improper matter and that the same is respectful and temperate in its language.

Certification

47.3 When any report, by-law, petition, or other written application or communication is read in Council, the Town Clerk shall certify on the back thereof the reading and date for all orders passed with regard thereto.

Actions, petitions, etc. to be referred

48.1 All actions against the Town and all petitions or other communications on any subject within the competence of a standing committee shall on presentation, be considered as referred to the appropriate committee without any motion, unless otherwise ordered; and no councillor shall speak upon or shall debate be allowed upon the presentation of a petition or other communication; but a councillor may move in referring the petition or communication, that certain instructions be given by Council or that the petition or communication shall be referred to a select committee; and if the petition or communication complains of some present personal grievance requiring immediate remedy, the matter therein contained may be brought into immediate discussion and disposed of forthwith by Council.

Select committee

49.1 Every councillor who shall introduce a petition or motion upon any subject which may be referred to a select committee shall be one of the committee and shall, unless Council otherwise determines, be the chairman of such committee.

Person not to be heard without permission

50.1 No person, not a councillor, shall be heard in Council without the permission of the Council.

Presence within the bar

51.1 No person, except councillors and of the Council, shall be allowed within the bar during the sitting of the Council without the permission of the Mayor.

Police

52.1 One of the policemen of the Town may, on request of the Mayor or Council, attend all meetings of Council, and, if ordered by the Mayor or other presiding officer, on resolution of Council, such officer shall expel and exclude from the meeting any person who has been guilty of improper conduct at such meeting.

Voting

53.1 When a division on any question is requested the presiding officer shall call for the yeas and nays, that is, the councillors voting in the affirmative shall rise and be counted and then sit down, and then the councillors voting in the negative shall rise and be counted and then sit down, and the presiding officer shall then declare the result.

Secret ballot

53.2 When any two councillors so request, the yeas and nays shall be taken by secret ballot.

Rules of Parliament

54.1 In all cases not specifically provided for herein, the Rules of Parliament shall govern the proceedings of Council.

Suspend rules

55.1 No standing rule or order concerning the meetings of Council shall be suspended except by the unanimous vote of councillors present.

Repeal

56.1 All former Council Procedure By-laws of the Town are hereby repealed and this by-law substituted therefor.

Approved by Town Council: July 27, 1978
Approved by M.M.A. : January 16, 1979

TOWN OF LUNENBURG

BY-LAW NO. 6

COMMITTEES AND BOARDS BY-LAW

Short title

1.1 This by-law shall be known as and may be cited as the "Committees and Boards By-law".

Standing committees

2.1 The Council shall appoint annually, as soon after the election as is convenient, the following standing committees:

2.1.1 General Government Services Committee,

2.1.2 Protective Services Committee,

2.1.3 Transportation Services Committee,

2.1.4 Environmental Health Services Committee,

2.1.5 Public Health and Social Assistance Committee,

2.1.6 Environmental Development Services Committee,

2.1.7 Recreation, Cultural Services and Education Committee,

2.1.8 License Committee,

2.1.9 Tenders Committee,

2.1.10 Cemetery Committee,

2.1.11 Water Committee, and

2.1.12 Electric Light Committee.

Memberships

2.2 Each committee shall consist of three members or such other members as the Council directs.

Other committees

2.3 Council may appoint such other standing or select committees as from time to time it deems necessary.

Mayor ex officio member

3.1 The Mayor shall be an ex officio member of all standing and select committees.

Boards and committees

4.1 The Council shall also at the same meeting appoint such members of the following boards and committees as under the provisions of any statue or regulation it has power to appoint:

4.1.1 Board of Arbitration between Municipality of Chester and Municipality of Lunenburg and the Towns of Lunenburg, Bridgewater and Mahone Bay,

4.1.2 Board of School Commissioners,

4.1.3 Board of Fire Escapes,

4.1.4 Members of the District Planning Commission,

4.1.5 Housing Commission,

4.1.6 Industrial Commission,

4.1.7 Planning Advisory Committee,

4.1.8 Lunenburg War Memorial Community Centre Commission,

4.1.9 South Shore Regional Library Board,

4.1.10 Lunenburg Home for Special Care Corporation,

4.1.11 Common Lands Committee, and

4.1.12 Fishermen's Memorial Hospital Board.

Other boards, etc.

4.2 The council shall also at the same meeting appoint such members of such boards and commissions as it is authorized to do under any Act or regulation.

Duties of committees	5.1	Standing and other committees shall:
Reports and recommendations	5.1.1	Report to Council from time to time, whenever desired by Council and as often as the interests of the Town may require on all matters connected with the duties imposed on them respectively and recommend such action by Council in relation thereto as may be deemed advisable or necessary.
By-laws	5.1.2	Prepare and introduce into Council all such by-laws as may be necessary to give effect to such of their reports and recommendations as are adopted by Council.
Act on resolutions and by-laws	5.1.3	Give effect through the proper officers to all by-laws and resolutions of Council that relate to their duties.
Accounts	5.1.4	Examine all accounts connected with the discharge of their duties, for performance of any work or for the purchase of any materials or goods under their supervision.
Report on matters referred	5.1.5	Consider and report on any and all matters referred to them by the Council or the Mayor, and every such report shall be signed by the Chairman.
Annual report	5.1.6	Present to Council on or before the last regular meeting of Council in each and every year for the information of Council and of the citizens generally, as well as for the guidance of the committees of the following

year, a general report of the state of the various matters referred to them respectively during the year, the work or business done through or by each committee, and the expenditure made under their authority and superintendence and such report shall contain such suggestions in regard to the future action of the succeeding committees as experience may enable the reporting committee to make in respect to the matter embraced in their report.

Bonding — 5.1.7 See that the persons in office or appointed to office, connected with the department of each respective committee, have given or do give the necessary security for the performance of their duties, and in case of any new appointment, that the security is given before any such person enters upon his duties.

Meet monthly — 5.1.8 Hold a regular meeting for the transaction of the business of the department over which such committee presides at least once in each month.

Special committees — 6.1 The Council may from time to time appoint special committees as it deems necessary for the purpose or enquiring into and reporting upon any matter referred to any such committee.

Chairman — 6.2 The first named member of every committee shall act as its chairman.

Chairman absent — 6.3 In the absence of the chairman in any regularly called meeting a quorum of the committee present may appoint a chairman pro tempore.

Vacancy

7.1 If any councillor so appointed at any committee ceases to be councillor he shall thereupon cease to be a member of such committee, and the Council shall appoint another to fill the vacancy.

Removal

7.2 Where the appointment is held during pleasure, the Council may by majority vote remove any member or committee or any member of the board or commission which it has power to appoint.

Appointment without notice

7.3 A vacancy happening in any committee or in respect to any member appointed by Council in any board or commission, may be filled by resolution of the Council at any meeting, and without giving any notice of motion.

Report in writing

8.1 The report of every committee shall be in writing, signed by the chairman or majority of the committee. If the committee is not unanimous the minority may submit a separate report or reports.

Marked by Town Clerk

8.2 All reports of the committees, written resolutions, petitions and other original communications to Council shall be numbered and initialled by the Town Clerk and marked with the date of the meeting of the Council at which they are presented, and shall be referred to in the minutes in addition to any other designation by such numbering of all such reports and resolutions, petitions and other communications and shall be filed in convenient form by the Town Clerk and remain as part of the records of Council.

Proposed expenditures

9.1 It shall be the duty of all standing or other committees of Council to consider and report to Council on or before the first day of March in every year a general statement of its proposed expenditures for the forthcoming year giving as fully as may be the reasons which necessitated the same.

Appropriations

9.2 The report of the various committees on the proposed expenditures of their committee shall be typewritten and only considered by Council at the meeting next succeeding that on which the said report is made, except by a two-thirds vote of the whole Council, and the report of the said committee when agreed to or amended shall constitute the appropriations of Council for the several services to which that report relates.

Accounts to be referred

10.1 All accounts and claims against the Town and all proposed appropriations of money shall, unless otherwise specially provided for by-law or resolution of Council to be referred to and reported on by the proper committee or committees and the report thereon adopted by Council before being paid, and every such resolution and report and all other resolutions and reports relating to the Town expenditures and finances shall be duly entered in the minutes of Council at length.

General committee

11.1 The General Government Services Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

11.1.1 general legislative services, including meetings of Council and matters affecting the Mayor and councillors;

11.1.2 general administrative services, including officers, administrative staff and legal services;

11.1.3 financial management, including accounting, audits, budget control, purchasing, debt and sinking fund administration, pension fund administration and other financial management matters;

11.1.4 assessment, including liaison with provincial officials and assessment appeals;

11.1.5 taxation, including tax billing and collection, tax rebates and concessions, and matters concerning properties acquired for taxes;

11.1.6 common services, including multi-purpose building; and

11.1.7 general government services, including elections, plebiscites and public meetings; conventions and delegates; general accident and damage claims and public liability insurance; inter-governmental relations; and grants to organizations and individuals.

Protective Services Committee

12.1 The Protective Services Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

12.1.1 liaison and cooperation with the Town of Lunenburg Police Commission;

12.1.2 traffic planning and control;

12.1.3 police station and buildings;

12.1.4 administration of justice responsibilities of the Town, including courts, registry office, prosecutor, witnesses and jurors;

12.1.5 fire protection responsibilities of the Town including the fire fighting force; buildings and equipments; fire alarm systems; fire investigations and prevention; water supply and hydrants; and training of fire fighting personnel;

12.1.6 the Emergency Measures Organization of the Town and flood control; disaster control; and first aid and ambulance services;

12.1.7 consumer protection as far as it is a responsibility of the Town, including weights and measures and weigh scales;

12.1.8 protective inspection, including building inspection; electrical inspection; plumbing inspection; and other safety inspections;

12.1.9 animal and pest control, including dog and weed control.

Transportation Services Committee

13.1 The Transportation Services Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

13.1.1 general engineering services, including equipment, workshops, yards and buildings;

13.1.2 road transport, including planning and surveying, maintenance and supervision;

13.1.3 engineering planning and design;

13.1.4 roads and streets, including surfaces, allowances, intersections, approaches, sidewalks, ditches, storm sewers and storm drainage systems; street cleaning; and snow and ice removal;

13.1.5 street lighting;

13.1.6 traffic services, including street signs, traffic lane marking, house numbering, traffic signals and railway crossings;

13.1.7 parking, including meters and off-street parking;

13.1.8 water transport, including docks and port facilities; ship canals and channels; and

13.1.9 public transit, including research planning and design.

Environmental Health Services Committee

14.1 The Environmental Health Services Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

14.1.1 sewage collection, treatment and disposed systems;

14.1.2 comfort stations;

14.1.3 garbage and waste collection, disposal and use, including Town dumps, landfills and incinerators; and

14.1.4 environmental protection, including air pollution control; water pollution control; noise abatement and other environmental protection measures.

Public Health and Social Assistance Committee

15.1 The Public Health and Social Assistance Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

15.1.1 cooperation with provincial and federal health authorities and the Board of Health in cooperative or joint programs;

15.1.2 cooperation with provincial, federal and local health authorities in the provision of medical care (including care of indigents) and hospital services; and

15.1.3 social assistance and the provision of welfare services to the aged, unemployed, handicapped, disadvantaged, one-parent families and children.

Environmental Development Services Committee

16.1 The Environmental Development Services Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

16.1.1 environmental planning and zoning;

16.1.2 general land assembly; urban renewal; beautification; land rehabilitation and other community developments;

16.1.3 housing, either by construction, operation and maintenance, or by encouraging such through programs with or by other private or governmental authorities or otherwise;

16.1.4 natural resource development, including agricultural programs; water resource development and conservation; fisheries; forests; minerals and other natural resources;

16.1.5 assistance to regional development through cooperation with private or other governmental agencies;

16.1.6 industrial and commercial parks and commissions and assistance to industrial and commercial development;

16.1.7 the encouragement, development and promotion of tourism;

16.1.8 conventions and public receptions; and

16.1.9 markets.

Recreation and Cultural Services Education Committee

17.1 The Recreation and Cultural Services and Education Committee shall have the following services and matters under its charge and supervision and shall report to Council thereon:

17.1.1 cooperation and liaison with the Lunenburg War Memorial Community Centre Commission respecting recreational facilities including community centres and halls and arenas; swimming pools and beaches and marinas; golf courses; exhibitions; amusement parks and fairs; stadiums; and parks and playgrounds;

17.1.2 cultural buildings and facilities, including archives; historic sites; art galleries; museums; libraries; theatres; concert halls; zoos; aquariums and aviaries;

17.1.3 educational facilities and services, including adult retraining; nurseries and day schools; and

17.1.4 cooperation with and assistance to other private and government agencies providing educational services to the residents of the Town.

License Committee

18.1 The License Committee shall have under its charge and supervision the issuing of all licenses required by Council and shall perform such duties as may be required of them in reference to licenses by any Act, by-law or regulation, or committed to their charge by Council.

Tenders Committee

19.1 The Tenders Committee shall have under its charge and supervision and control of all Town tenders and shall perform such duties as may be required of them in reference to tenders by Council.

Cemetery Committee

20.1 The Cemetery Committee shall have under its charge and supervision the control of cemeteries, crematoriums and morgues and shall perform such duties as may be required of them in connection therewith.

Water Committee

21.1 The Water Committee shall have under its charge and supervision and control the source, purification, protection and treatment of the water supply; transmission and discussion of water; and customer billing and collection for water supply.

Electric Light Committee

22.1 The Electric Light Committee shall have under its charge and supervision and control the production and/or purchase and distribution of electric energy; customer billing and collection for electric energy supply.

Complaints

24.1 Any ratepayer of the Town may complain to or lay any grievance before the chairman of any standing committee of any service of the Town who shall bring the matter before the first regular meeting of the Council thereafter, with a statement of the complaint or grievance and of what has been done by the committee in respect of the same.

Repeal

25.1 All former Committees and Boards By-law of the Town are hereby repealed and this by-law substituted therefor.

Approved by Town Council: July 27, 1978
Approved by M.M.A. : January 16, 1979

2020 TOWN OF LUNENBURG EXTERNAL APPOINTMENTS

COMMON LANDS	2020/21 Proposal
Mayor Rachel Bailey (Lunenburg Town Council appointment)	Councillor_____
Laurence Mawhinney (Lunenburg Town Council appointment)	Councillor_____
Councillor Errol Knickle (Municipality of the District of Lunenburg appointment)	Councillor_____(Municipality of the District of Lunenburg appointment)
Eric Walters (Municipality of the District of Lunenburg Appointment)	Eric Walters (Municipality of the District of Lunenburg appointment)
Peter Tanner	Peter Tanner

(Membership is comprised of two Town of Lunenburg residents **annually** appointed by the Lunenburg Town Council; plus two residents of the Municipality of the District of Lunenburg east of the Town of Lunenburg appointed annually by Municipality of the District of Lunenburg Council; and one "selected by a County Court Judge of District #2".)

CULTURAL PLAN IMPLEMENTATION GROUP	2020/21 Proposal
	Deputy Mayor Mosher

LUNENBURG ACADEMY FOUNDATION	2020/21 Proposal
Councillor Ronnie Bachman	Councillor Ernst

LUNENBURG COUNTY SENIOR SAFETY ADVISORY PARTNERSHIP	2020/21 Proposal
_____	Councillor Birtles

LUNENBURG FISHERMEN'S MEMORIAL SOCIETY	2020/21 Proposal
Mayor Rachel Bailey	Mayor Risser
Councillor Peter Mosher	Deputy Mayor Mosher
Members of the Fishermen's Memorial Society Tribute Society Sub-Committee	Members of the Fishermen's Memorial Tribute Society Sub-Committee

LUNENBURG HARBOUR HEALTH ADVISORY GROUP — **2020/21 Proposal**

Membership

Two (2) Municipal Government representatives

Councillor Errol Knickle, MODL	Councillor _____
Councillor Matt Risser, Town of Lunenburg	Councillor _____

Four citizen representatives

Dr. David Maxwell, Municipality of the District of Lunenburg (preferably from the Garden Lots area)

David Friendly and Graham Pearson, Town of Lunenburg

Four (4) industry representatives, who have a footprint that impacts Lunenburg Harbour (i.e., either owns property adjacent to the harbour or operates adjacent to or within the harbour)

- Ed Snook, High Liner Foods
- John Kinley, Lunenburg Industrial Foundry & Engineering
- Donna Knickle, Lunenburg Harbour Authority
- Doug Langley, Lunenburg Waterfront Development Association

Two (2) business community representatives, who have a stake in the health of the harbour
- Sheila Woodcock, Lunenburg Board of Trade
- Ida Scott, Economic Spectrum Unlimited

Two (2) tourism/recreation representatives, who have a stake in the health of the harbour
- Ryan Tanner, Marine Biologist, Fisheries Museum of the Atlantic
- Ioan Ciente, Ashlea House B&B

Provincial Government
- Adam Langley, Development Nova Scotia (formerly Waterfront Development)

Resource Personnel

Bluenose Coastal Action Foundation
- Brooke Nodding, Executive Director
- Shanna Fredericks, Assistant Director
- Rick Welsford, Chair of Board of Directors

Town of Lunenburg
- Heather McCallum, Assistant Municipal Clerk
- Ian Tillard, Town Engineer

Municipality of the District of Lunenburg
- Stephen Pace, Staff Engineer

Provincial Government
- Mike MacDonald, NS Environment

Federal Government
- Environment Canada Water Quality Specialist – *will act as an advisor to the group as needed.*

TERMS OF REFERENCE

Definitions
1. **'Advisory Group'** or **'Group'** refers to the standalone Lunenburg Harbour Health Group.
2. **'Chair'** means the person elected by the Group to preside at meetings.
3. **'Vice Chair'** means the person elected by the Group to preside at meetings when the Chair is unavailable;
4. **'Director'** refers to the Executive Director or Assistant Director for Bluenose Coastal Action Foundation;
5. **'Members'** means members of the Lunenburg Harbour Health Advisory Group;
6. **'Quorum'** means 50% + 1 of the membership of the Group

Mandate of the Group
The Lunenburg Harbour Health Advisory Group is a standalone advisory entity facilitated by Bluenose Coastal Action Foundation (Coastal Action) for the purposes of protecting the health of Lunenburg Harbour through the identification of threats and development of feasible solutions.
Group Objectives
1. Provide a forum for discussion on issues affecting the health of Lunenburg Harbour.
2. Consult with, advise, and make recommendations pertaining to existing and potential threats to the health of Lunenburg Harbour. Resulting advice and recommendations could be directed at one or all levels of government, as well as industry, depending on the issue and jurisdiction.
3. Consult with, advise, and develop potential solutions for harbor health improvements. This will include recommendations based on the

results of the proposed harbor monitoring program.
4. Promote communication and collaboration between various stakeholders.
5. Assist with developing and delivering relevant communication and outreach tools and materials for public engagement.
6. Pursue funding opportunities for monitoring program and other potential solutions that result from the group.

Group Membership

1. The members of the Advisory Group shall consist of fifteen (15) members as well as resource personnel from Coastal Action, Town of Lunenburg, Municipality of the District of Lunenburg, Nova Scotia Environment, and Environment and Climate Change Canada. [See membership list above.]

Expectations of Group Members

Group members are expected to:

1. Understand the mandate of the Group.
2. Understand their role as a Group member.
3. Understand the role of the Group Chair.
4. Strive to attend all scheduled and special group meetings.
5. Prepare for meetings by reading agendas and any background information supplied.
6. Actively participate in the discussion and decision-making process.
7. Undertake any work assigned, including special projects, participation on sub-committees and research.
8. Be open-minded and allow for a variety of opinions to be heard.
9. Respect the individual worth and dignity of opinions of other Group members and maintain a high degree of decorum.
10. Refer to the Chair for questions and procedure.
11. Recognize the limitations on participation and inform the chair of your limitations.
12. Ask questions and seek clarification through the Chair or resource personnel.
13. Respect the decisions and finality of the Group.
14. Clearly identify and orally disclose any conflict of interest, and refrain from any discussion which could influence the opinions of Group members.
15. In a public forum, clearly identify when they are speaking in their capacity as a group member, or as an independent citizen, where appropriate.

Appointment of Sub-Committees

1. The Group may appoint a sub-committee from its members to investigate and report on any matters related to Group business, provided that:
    a. The sub-committee, reports directly to the appointing Group.
    b. The established sub-committee does not have the power to appoint a further committee nor shall it add to its membership without permission from the Group.

Membership Selection Process & Criteria

1. Prospective members of the Group will be required to submit a completed 'Invitation to Serve' application (Schedule A) to the committee, if stakeholder interest exceeds that of the available positions.
2. The call for the invitation to serve process shall, at minimum, include one notice in the local newspaper and on Coastal Action's website / social media platforms, and provide a minimum of two weeks for responses.
3. All applications received will be reviewed by the Group and decisions on appointments will be done by consensus.
4. Where a vacancy occurs on the Advisory Group, other than by reason of the expiration of the term of a member, the Group upon response to a call for an Invitation to Serve, and review and input from the Group, shall appoint a person to fill the vacancy as soon as possible; and that person shall hold office for the remainder of the term of the member in whose place that person is appointed.

Calling Meetings

1. Meetings will be held three (3) times a year (January, April, and September) unless decided otherwise by the Chair.
2. Special meetings and sub-committee meetings can be called as needed.
3. Regular meetings of the Group shall be held on at least seven (7) days' notice, but emergency meetings may be called by the Chair on one day's notice.

Absenteeism

1. If a member is absent without good reason or prior acknowledgement from meetings of the Group for two (2) out of the three (3) meetings in any one (1) year, the Group may declare the position vacant and ask for a replacement member.
2. Should a member of the Committee Group not be able to attend a regular meeting of the Group, the member shall advise the Chair at least one (1) day prior to the meeting unless there are extenuating circumstances.

Meeting Procedures

Procedurally, the following shall be followed:

1. The Group makes recommendations based on general consensus.
2. Quorum shall be a simple majority (50% + 1) of the Group members.
3. Non-quorum meetings shall be permitted, but may not contain any actions to be taken, or recommendations.
4. If the Chair is not present at the group meeting, the Vice Chair shall preside. If the Vice Chair is not present at the group meeting, the members present shall appoint, by consensus, an acting Chair, who will preside for the duration of the meeting.

Administration

1. Proposed agenda items should be submitted to the Director for consideration by the Chair.
2. The Chair is responsible for meeting agenda content and shall review proposed agenda items with the Director before each meeting.
3. No Group member shall instruct or give direction to, either publicly or privately, any resource personnel involved in the group.

LUNENBURG COUNTY JOINT ACCESSIBILITY COMMITTEE

2020/21 Proposal

Councillor Sanford
Councillor Duggan

Councillor Matt Risser (alternate)

Lunenburg County Accessibility Advisory Committee Terms of Reference

1.0 PURPOSE

The Lunenburg County Accessibility Advisory Committee's (AAC) role is to assist the five municipal units (the Districts of Chester and Lunenburg and the Towns of Bridgewater, Lunenburg and Mahone Bay) in Lunenburg County develop an Accessibility Plan in accordance with "An Act Respecting Accessibility in Nova Scotia, 2017 (The Act). The AAC provides advice to the five municipal councils on identifying, preventing and eliminating barriers to people with disabilities in municipal programs, services, initiatives and facilities. The Committee plays a pivotal role in helping the five municipalities become barrier-free communities and ensuring the obligations under the Act are met.

2.0 SCOPE

These Terms of Reference are applicable to all members appointed to the Lunenburg County Accessibility Advisory Committee (ACC).

3.0 REFERENCES

3.1 Bill No. 59 – Accessibility Act, Chapter 2 of the Acts of 2017

4.0 DEFINITIONS

4.1 **Barrier** means anything that hinders or challenges the full and effective participation in society of persons with disabilities including a physical barrier, an architectural barrier, an information or communication barrier, an attitudinal barrier, a technological barrier, a policy or a practice.

4.2 **Council(s)** means the Councils for the Districts of Chester and Lunenburg and the Towns of Bridgewater, Lunenburg and Mahone Bay.

4.3 **Disability** includes a physical, mental, intellectual, learning or sensory impairment, including an episodic disability (long-term conditions that are characterized by periods of good health interrupted by periods of illness or disability); that, in interaction with a barrier, hinders an individual's full and effective participation in society.

5.0 POLICY

5.1 Membership

5.1.1 The Committee shall consist of ten (10) voting members who serve without pay, except for associated expenses. Five (5) community members and five (5) Council members. Each Council will appoint their own Council member representative. The five (5) community representatives are to be appointed by all five (5) municipal units.

5.1.2 Applications for the community members will be sent to the Lunenburg County Accessibility Nominating Committee. This Committee will be comprised of the Mayors/Wardens of the five municipal units **or their designate**. The Nominating Committee will send a recommendation to all five councils concerning the appointment of the community members.

5.1.3 Councils shall appoint each of the five (5) community representatives' members as follows: Two members (2) to a three (3) year term; two members (2) to atwo (2) year term; and one-member (1) to a one (1) year term. Once a member has completed their term all new terms will be for three (3) years.

5.1.4 Councils shall appoint a Council representative and an alternate from each of their respective municipal units. Council members' terms will be for two years.

5.1.5 At least one half of the members (community and council representatives) of the AAC must be persons with disabilities or representatives from organizations representing persons with disabilities.

5.1.6 If a community member vacates the Committee for any reason at any time before that member's term would normally expire, the Councils shall appoint promptly a new member to the Committee to hold office for the unexpired term.

5.1.7 If a Council member vacates the Committee for any reason at any time before that Council member's term would normally expire, the Council that the member represents shall appoint promptly a new Council member to the Committee to hold office for the unexpired term.

5.1.8 Applications for the appointment of community representatives to the Committee shall be invited by public advertisement.

5.1.9 The Chair and Vice-Chair will be appointed annually by the Committee.

5.2 Qualifications

5.2.1 Any member of the Committee is eligible for reappointment.

5.2.2 Any member of the Committee, who is absent from three (3) consecutive meetings of the Committee, forfeits office, unless the absence is caused by illness or authorized by resolution of the Committee and noted in the Committee minutes. Any member who forfeits office is eligible for reappointments following the remainder of the unexpired term.

5.3 Mandate of Responsibilities

The Committee has the following responsibilities:

5.3.1 Advise the five Councils in the preparation, implementation and effectiveness of an Accessibility Plan. In accordance with the Act, the Plan must include:

a. A report on measures the five (5) municipal units have taken and intend to take to identify, remove and prevent barriers;

b. Information on procedures the five (5) municipal units have in place to assess the following for their effect on accessibility for persons with disabilities:

i. Any of its existing and proposed policies, programs, practices and services, and

ii. Any existing and proposed enactments or bylaws it will be administering; and

c. Any other prescribed information.

5.3.2 Advise all five (5) Councils on opportunities to promote the full participation of persons with disabilities, in accordance with the Act;

5.3.3 Identify and advise on the accessibility of existing and proposed municipal services and facilities;
5.3.4 Advise and make recommendations about strategies designed to achieve the objectives of the five (5) municipal units Accessibility Plan;
5.3.5 Receive and review information directed to it by all five (5) municipal Councils and their committees, and to make recommendations as requested;
5.3.6 Monitor federal and provincial government directives and regulations; and
5.3.7 Host public consultations related to accessibility
5.3.8 Provide input and advice to all five (5) councils with respect to updating the Accessibility Plan every three years.
5.3.9 Provide an annual budget for the five (5) Councils consideration in order for the Committee to carry out their mandate.

5.4 Rules of Engagement:

5.4.1 Committee meetings will be called by the Chair as required to fulfill the duties outlined. Meetings of the ACC shall be open to the public and advertised no less than one week in advance.
5.4.2 A majority of the appointed voting members of the Committee constitutes a quorum.
5.4.3 Subject to the principles set out in the **Municipal Conflict of Interest Act,** all committee members present including the person presiding shall vote on a question.
5.4.4 Subject to section 22 of the **Municipal Government Act**, meetings of the committee are open to the public
5.4.5 The Committee may receive presentations from the public upon the approval of the Chair.
5.4.6 The Committee may establish Working Groups to explore specific issues related to the Accessibility Plan and/or other responsibilities. Members of the Working Group may consist of additional members of the community. A member of the AAC shall chair the Working Group.

5.5 STAFF RESOURCES

5.5.1 The Committee will be supported by municipal staff and consulting resources as required.
5.5.2 Staff appointed by the five (5) municipal units will attend meetings as a resource to the Committee.
5.5.3 The Municipalities will provide administrative support services to the Committee to aid in agenda preparation, minute taking, and other administrative duties as required.

6.0 POLICY REVIEW

6.1 These Terms of Reference will be reviewed by each of the five (5) Councils at least every four years from the effective/amended date.

LUNENBURG HOME FOR SPECIAL CARE CORPORATION	**2020/21 Proposal**
	Councillor Birtles
Jenise Brouse	Jenise Brouse
John Donaldson	John Donaldson
Diane Johnson	Diane Johnson
Jackie Moore	Jackie Moore
Virginia Uhlman	Virginia Uhlman
Ellen Wathen	Ellen Wathen

LUNENBURG WATERFRONT ASSOCIATION	**2020/21 Proposal**
Mayor Rachel Bailey	Mayor Risser

REGION 6 SOLID WASTE MANAGEMENT COMMITTEE	**2020/21 Proposal**
Mayor Rachel Bailey	Councillor Halverson
Councillor Danny Croft (alternate)	Mayor Risser (alternate)

REGIONAL EMERGENCY MANAGEMENT ORGANIZATION (REMO)	**2020/21 Proposal**
Mayor Rachel Bailey	Mayor Risser
Deputy Mayor John McGee	Deputy Mayor Mosher

SOUTH SHORE HOUSING ACTION COALITION	**2020/21 Proposal**
	Councillor Duggan

WESTERN REGIONAL HOUSING AUTHORITY	**2020/21 Proposal**
Helen Lanthier	Helen Lanthier

Section 22(1) of the Housing Act - The Governor in Council may constitute a body corporate to be a regional housing authority, prescribe its membership and manner of appointment.

SOUTH SHORE REGIONAL LIBRARY BOARD	**2020/21 Proposal**

Section 10 of the Libraries Act = 1 x member of Council or public for a period as determined by the Council making the appointments.

Document No: 7 (b) (i)
Meeting: Council, November 24, 2020
Circulate: Council, IT, DMP, LD
File: WWTP

M E M O R A N D U M

TO: **TOWN COUNCIL**

FROM: **IAN TILLARD, TOWN ENGINEER CONSULTANT**

DATE: **NOVEMBER 19, 2020**

RE: **WASTEWATER TREATMENT PLANT AND OUTFALL EXTENSION PROJECT UPDATE**

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1. BACKGROUND STUDIES AND INVESTIGATIONS

ABL Outfall Extension Report 2014
Extend the outfall, three options, each further apart

ABL Environmental Engineering Report 2017

- Headworks; screening problems
- DAF
    - Level and flow control upgrades
    - Foaming from salt water
    - Some recommendations on potential mechanical improvements related to effectiveness
- MBBR; aeration system upgrade (since completed)

CBCL Evaluation and Options Identification Final Report, 2018

- Headworks; screening problems and odour problems (ventilation upgrade completed since this report was issued)
- MBBR; aeration system upgrade (since completed)
- DAF
    - Level and flow control and other control upgrades needed
    - Salt water
    - Polymer system controls
- Ultraviolet Disinfection system
    - Capacity is inadequate for the flow
- General Asset Condition; varying conditions, some elements at the end of life and need upgrading, considerable corrosion and metals need to be upgraded to stainless for some elements and some elements are ok.

- Performance of the entire plant; occasional exceedances above regulatory limits for BOD, Coliforms and Total Suspended Solids
- Wastewater flow and quality
    - Salt water infiltration
    - Effluent out of compliance
- Proposed WWTP solution options:
    1. Option 1
        - Upgrade screen in headworks
        - Replace MMBR with a fixed media reactor system. Repairs were completed to the MBBR and additional media added in 2020 which has improved performance. Any further upgrades TBA.
        - Instrumentation upgrade
        - DAF optimization
        - New polymer make down system
        - UV system upgrade
        - Emergency generator
        - Other repairs based on condition assessment of all buildings and equipment
    2. Option 2
        - Upgrade screen in headworks
        - MMBR upgrade. Repairs were completed to the MBBR and additional media added in 2020 which has improved performance. Any further upgrades TBA.
        - Instrumentation upgrade
        - DAF replacement including polymer make down system
        - UV system upgrade
        - Emergency generator
        - Other repairs based on condition assessment of all buildings and equipment
    3. Option 3
        - Upgrade screen in headworks
        - Change bio-reactor to activated sludge system.
        - Instrumentation upgrade
        - Change DAF's to a membrane system including blowers pumps etc. and to be installed in a new building
        - UV system upgrade
        - Emergency generator
        - Other repairs based on condition assessment of all buildings and equipment
- The cost indications for the options are lowest to highest going from 1 to 3
    1. $4.0 M
    2. $7.5 M
    3. $10.0 M

- The ease of operation for the options are better for options 1 and 2 and more intense for option 3. This is reflected in the cost as well of operations with options 1 and 2 being lowest and higher for option 3.
- The amount of disruption and plant bypass are lowest to highest going from 1 to 3
- For all WWTP options, there are some basic upgrades required to replace other worn out elements
- The report deals with the sewer outfall as a separate section and suggests that an extension would be needed for option 1 at a cost of under $1.8 M.

Dillon Peer Review Report, 2019

The Dillon letter report reviews and provides comments on the entirety of the CBCL report. They recommend a variation of Option 1, referred to as “Option 4”, which is to upgrade the existing plant as follows:

- Upgrade headworks if deemed beneficial by the town
- Install emergency generator if deemed beneficial to the town
- Retaining and topping up the existing MBBR media (This has since been successfully completed)
- Replacing the aeration system piping (This has also been successfully completed)
- DAF operational assessment, including polymer salinity trials (Dalhousie study ongoing);
- DAF upgrades, or new DAF units
- UV upgrade if required following DAF upgrades;
- Proceed with sewer outfall extension and suggests that the cost estimate should be $3 M.

The Dillon report details a step by step approach in pursuing Option 4;

1. Identify WWTP upgrades that are associated with worker safety (e.g. grating, handrails, air quality). Consider a H2S sensor/alarm in the headworks building (completed);
2. Proceed with next engineering steps and initiate regulatory discussion for outfall extension;
3. Perform microscopic examination of MBBR reactors to determine if filamentous bacteria are present;
4. Replace MBBR aeration system. Consideration should be given to material selection, life expectancy, and life cycle cost. Estimate media volume when tanks are drained;
5. Top up MBBR media;
6. Engage Suez (DAF manufacturer) to explore options;
7. Perform regular polymer trials as part of DAF optimization. Testing should include an evaluation of salinity effects and limitations for different chemical products;
8. Based on DAF study, proceed with DAF modifications, or consider new DAF units;

9. Evaluate adding capacity of UV disinfection following DAF optimization, when a new baseline for plant UVT is established;
10. Assess optional instrumentation upgrades using a cost-benefit approach. Consider the likelihood of whether the operations' team will use the additional data for operational optimization, operational cost savings, or risk reduction;
11. Rigorous testing and enforcement of sewer bylaw, coupled with a public awareness program;
12. Continue to collect influent, effluent and flow data to better support future operations and design effort; and
13. Implement or increase annual capital maintenance budgeting to account for more routine "wear and tear" upkeep.

These recommendations were subsequently reviewed and supported by CBCL as further described below. This formed the basis of the Request for Proposals for engineering pre-design services for issuance as reported at the July 9, 2020 Council meeting. Staff were recently asked to place the issuance of the RFP on hold until this report could be prepared and reviewed by the new Council for further direction.

CBCL Collection Inflow & Infiltration Report, 2019

The report indicates that there is about 60% more flow going into the collection system as guidelines would be used for designing a system and that is significant. The two aspects are:

1. Infiltration. The chief culprit of this is salt water and that is subject to an ongoing study. The early results of the study indicate that there are clearly a number of areas to address to reduce this.
2. Intrusion. An extensive part of the collection system is a Combined Sewer System. What this does mean is that rainfall and snow melt can enter the system via the catch basins and then gets pumped to the WWTP to be treated. The solution is to separate storm and sewer whereby on the sewer inflows get to the WWTP for treatment. This is a significant effort to achieve this. The steps that are being undertaken are:
    a. Four separation projects have been identified as a part of other studies and will be incorporated in the public works plan for future work. The first of these is planned for next year, pending funding.
    b. A Master Plan of the entire system needs to be developed to provide the data needed to model the storm flows and then determine what measures are needed to reduce these inflows. This is in the Public Works plan for future work.
    c. An initiative to separate roof storm water from direct drains to the collection system would be beneficial. This is in early stages of discussion within Public Works staff on how to develop a program to promote and enforce this within the town.

Lift Station Review

The lift stations were all inspected and repairs identified which have been made. At the same time an ongoing maintenance plan was developed and has been put in place. The plan consists of:

- Semi-annual and Annual checks to be done by a technical rep from the supplier.
- Weekly and monthly checks will be done in-house by PW forces.

2. WORK PLAN

Subsequent to the engineering reviews and recommendations an investigative program and other initiatives were put in place. The recommended options by CBCL (Option #1) and Dillon (Option #4) describe very similar scopes with the main difference being the approach to the project and whether it would be undertaken as a single large project or a project with incremental steps.

Of note is that the aeration project upgrade was completed after the reports were issued and the results demonstrate a marked improvement in the MBBR performance. This does mean that the specific recommendations for the biological reactor have evolved and when the full analysis is complete, there will likely be a hybrid solution – hybrid in the sense that engineered solution may have elements of CBCL's Option #1 and Option #2.

The recommendation for further data collection and assessment was essentially identical for the two engineering reports.

As a result, the program of investigation that is being undertaken was designed to follow the recommended steps to produce the information required for the next steps to upgrade the plant and outfall as recommended in the reports.

MBBR upgrade
This project was completed in 2020. Results are very positive.

Ongoing investigations

1. DAF Review. Suitability assessment and operations improvements. Ongoing discussions with the manufacturer.
2. Flood Study. Assessment of anticipated flood levels and measures needed for new plant. Work is complete and solutions will be incorporated in preliminary design phase. Temporary solution in place.
3. Salt Water Intrusion Study. Determine causes and propose concept solutions and estimates. Ongoing. Initial results indicate that there are some good achievable targets
4. Continuous flow trial of DAF's. Adjustments to process controls to try to improve effectiveness. Work is complete. Does not work with existing control equipment. Control upgrades required.
5. UVT testing. Test UVT regularly. Ongoing and results will be used in preliminary design.
6. Process testing. This work is ongoing with Dalhousie University and CBCL. Will be a part of inputs to the preliminary engineering phase. Scope includes depth assessment of:
    - Phase 1; MBBR assessment and salinity effects on DAF and Aeration
    - Phase 2; Optimization of DAF and UV effectiveness.

Other Initiatives

1. Sewer Discharge Bylaw awareness and enforcement. This is in ongoing effort, with the initial awareness program was started pre-COVID with notices to businesses in town and a request to submit reports. Next steps are to follow up on the initial notices and to determine possible enforcement methods.
2. Storm Water separation. This is an ongoing internal discussion on how to promote and to enforce having residential buildings separate roof rain water leaders from the collection system, e.g., divert the rain water leaders out of the building sewer lines.
3. Master Plan for the collection system. This is a future initiative with multiple steps and the intent is to have essentially a model of the entire wastewater system, based on GIS data and watershed data. The initial step of collecting GIS data is a project that has now been approved and will be completed in 2021.

3. KEY PRESENTATIONS TO COUNCIL

Dec 17, 2019
Dillon presentation of the Dillon Peer Review Report of the CBCL Final Report. The Dillon recommended was described as Option #4, as per notes above.

Mar 10, 2020
CBCL response to the Dillon report. There was general concurrence by CBCL with the conclusions in the Dillon report. CBCL re-iterated their recommendation that Option #1 is the preferred option from their point, which is very similar to the Dillon Option #4

July 09, 2020
Staff presentation to Council on the status of the WWTP project. The presentation consisted of a review of the PW execution plan which consisted of a step by step approach as noted above in the Work Plan. The Town Engineer highlighted that the next steps he was undertaking were a focus on the outstanding unknown issues; salinity reduction, DAF and UV optimization, accommodation of potential future increase in loads and issuance of an RFP with a Terms of Reference for the preliminary engineering design for the upgrades required. The scope of the Preliminary Engineering scope would be laid out to ensure that the work would be done within the budget and within the timeframes set by the funders.

4. NEXT STEPS

To quickly review the current status;

- The MMBR upgrades are complete and the results are outstanding.
- The salt water intrusion study is near completion
- The other investigative work on the DAF units and UV system are well underway
- All results will be available as inputs to the Preliminary Engineering phase within the time frame required to complete the Preliminary Engineering within the timeframe set by the funders.

- An RFP has been prepared for the Preliminary Engineering work based on following the recommended option. It has not been released yet pending Council's review of this report as requested.

The scope of work for this RFP includes:

- WWTP Capital Work
  - Headworks.
  - Aeration Blowers, and separate air header into two zones.
  - Compressor pipework.
  - Instrumentation and service water supply in Bioreactor building.
  - DAF polymer make down equipment
  - DAF level control and other modifications
  - Additional UV disinfection bank and retrofit of UV wiper system.
  - Standby Generator for critical equipment
  - HVAC systems
  - Flood control gates at the Highway 332 culvert
  - Identification of possible future expansion
- Condition assessment of the WWTP and updates required to determine:
  - Component condition and assessment of remaining life
  - Equipment obsolescence,
  - Current design problems and deficiencies
  - Compliance with Codes
  - Compliance with local Bylaws,
  - Confirmation of regulatory testing,
  - Functionality/Serviceability Assessment
  - Accessibility Standards.
  - Work required to maintain the facility in operating condition during the next 25 years for all of the facility elements:
    - Structural
    - Architectural
    - Electrical
    - Mechanical
- Outfall Extension
  - Identify and investigate a minimum of two options for outfall extension, each to a minimum of 1m submergence below LLWLT, and 100 m from shoreline at LLWLT:
    - Extending outfall from its current outfall location.
    - Building new outfall around the Front Harbour by land to a more suitable location.
  - Prepare conceptual dispersion model of the inner Lunenburg Front Harbour to do scenario analysis of the options and the impacts on the Harbour.
  - Open preliminary discussions with all relevant regulators

Time sensitivity

- The funding that has been approved for this work is time sensitive with a completion date of March 31, 2021 (see: Section 5 for additional financial background information). An extension has been requested to June 30, 2021 but approval has not yet been given for which there is no assurance. With just

over four months to issue the RFP, award and possibly complete the engineering work it is essential that the RFP be issued as soon as possible. If not, funding could be at risk should an extension not be granted.

5. FINANCIAL IMPACT

In September 2019 the Town received notification that our Provincial Capital Asset Program (PCAP) application to engage an engineering firm to develop the predesign for the Waste Water Treatment Plant (WWTP) upgrades was successful. The application approval included predesign work for outfall upgrades as well, if required, based on the various WWTP upgrade options being considered by Council. These funds were to be expended by March 31, 2020. In March 2020, the Town requested and was approved for an extension to March 31, 2021. We are seeking an additional extension to June 30, 2021 given this ongoing options review, however, the approval of same has not yet been received from the province.

The total budget for the predesign work is $270,000, funded 50% from PCAP and 50% from the Town's Gas Tax Fund allocation. A portion of these funds were allocated for the background studies described above, preparation of the RFP document and contingency funds. There is an upset limit for the RFP award of $200,000 plus HST.

6. STRATEGIC PLAN RELEVANCE

The Wastewater Treatment Plant predesign engineering work outlined in this report addresses a central component of the Town's Comprehensive Community Plan Strategic Direction Goals – 3. Servicing and Facilities.

7. RECOMMENDATON TO COUNCIL

It is recommended that Council approve the following draft motion:

Motion: moved and seconded that Public Works issue an RFP for the Preliminary Design of the WWTP and sewer outfall upgrades based on the scope and timelines as outlined in this report and to be tendered and awarded by Council in 2020 if possible.

Acknowledged only by:

Bea Renton
Town Manager/Clerk

Attachments - CBCL Power Point
- Dillon Consultant Report
- CBCL response to Dillon Report

Schedule "A"

Lunenburg WWTP Upgrade Options

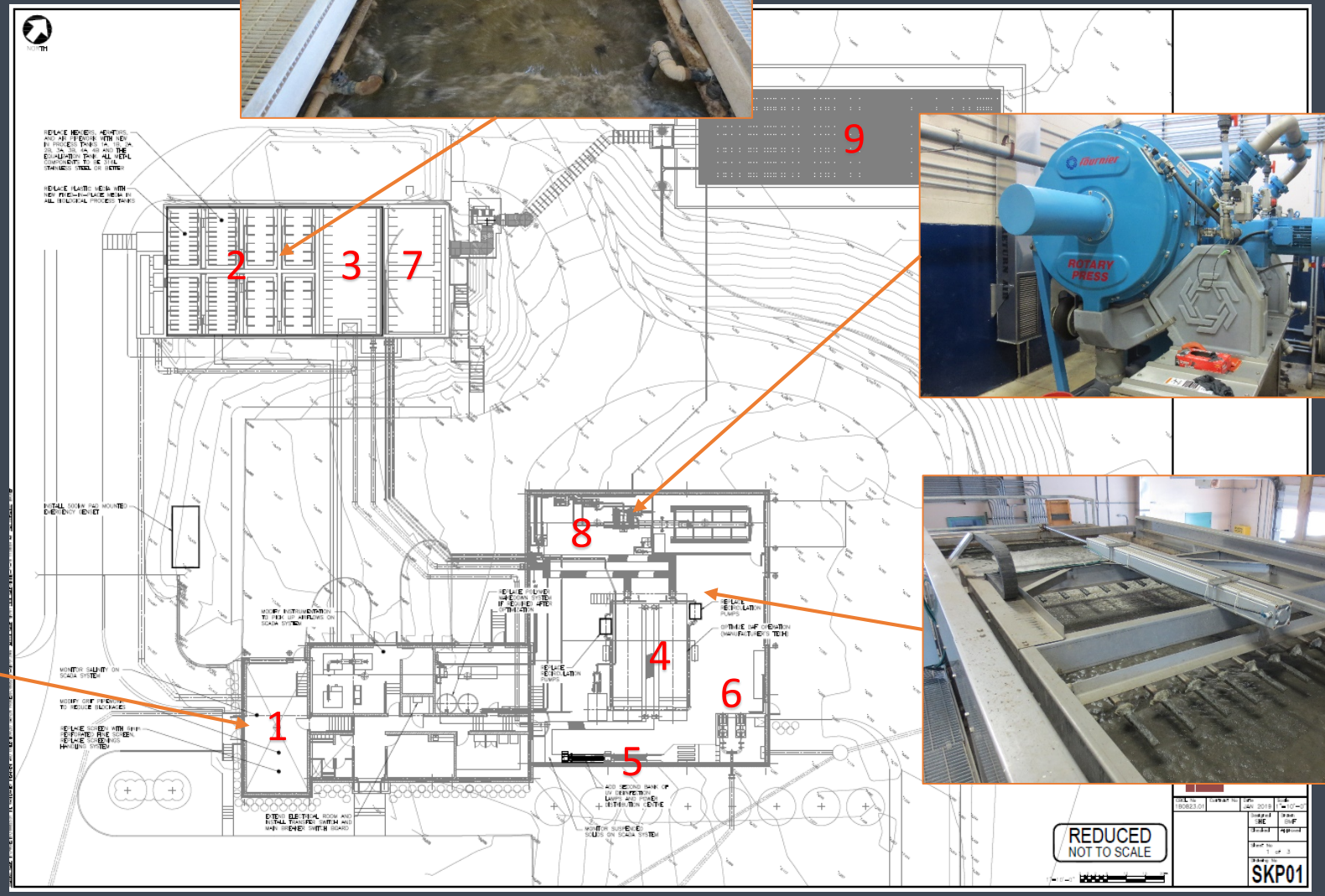
Presentation
May 23, 2019

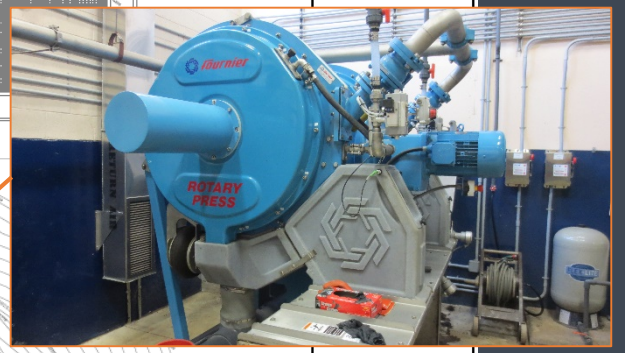
Outline

- Options for WWTP Upgrade
- Revised Cost Estimates
- Next Steps
- Discussion

Overview of WWTP

1. Headworks
2. Bioreactor Tanks
3. Equalization Tanks
4. Dissolved Air Flotation
5. Ultraviolet Disinfection
6. Effluent Pump Station
7. Sludge Holding Tanks
8. Sludge Dewatering
9. Biofilter





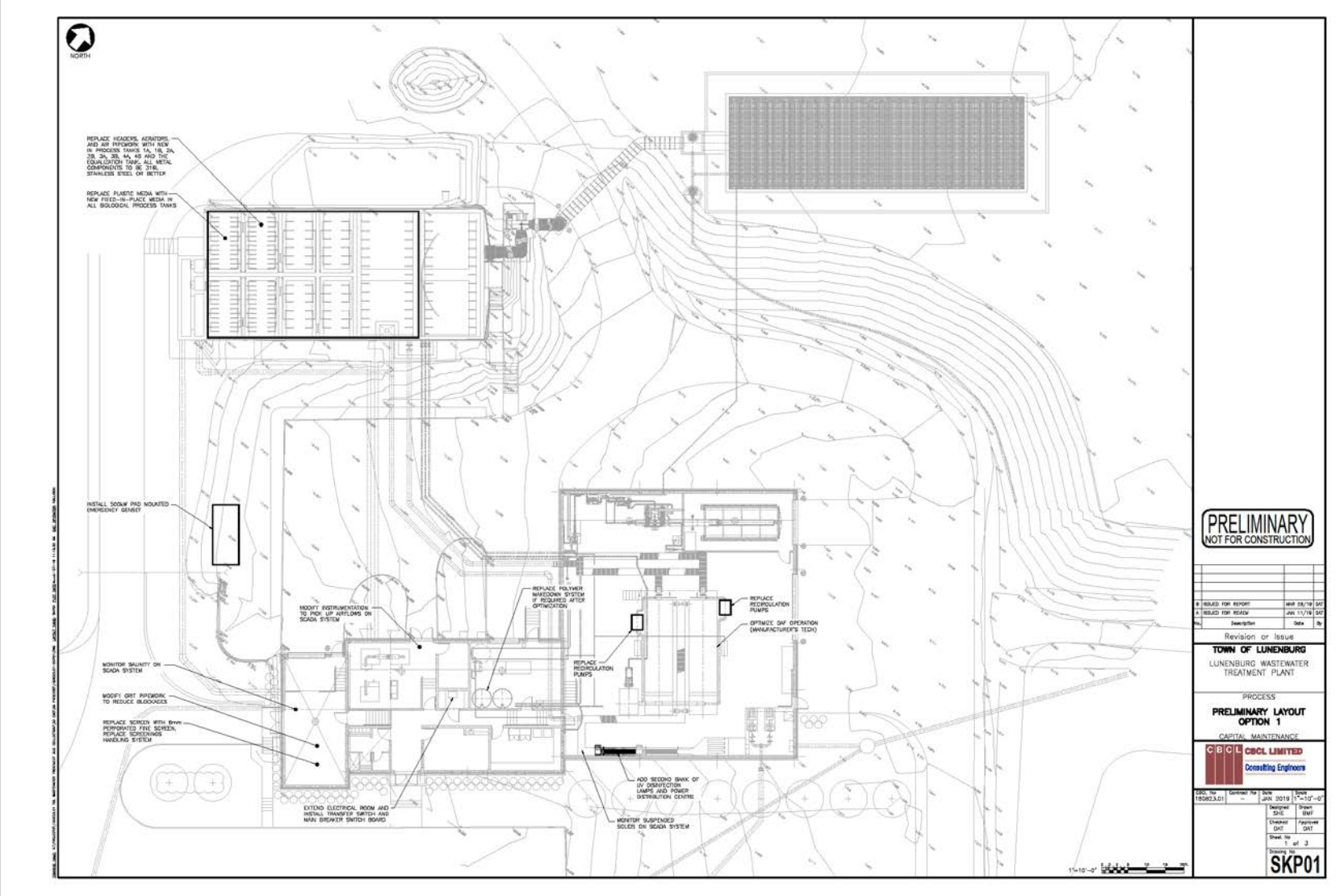
Summary of Existing Issues

- Debris gets past screen
- Bioreactor media is very worn
- Aeration system is in poor condition
- DAFs have polymer and solids carryover, as well as foaming
- UV system doesn’t have enough bulbs to disinfect at low UVT%
- No backup generator
- Outfall is too close to shore and in an inadequately mixed location

Options Identification

- Option 1 – Capital Maintenance of Existing Process
- Option 2 – Upgrade Existing Process
- Option 3 – Replace with MBR Process
- Supplementary Option A – Extend Existing Outfall

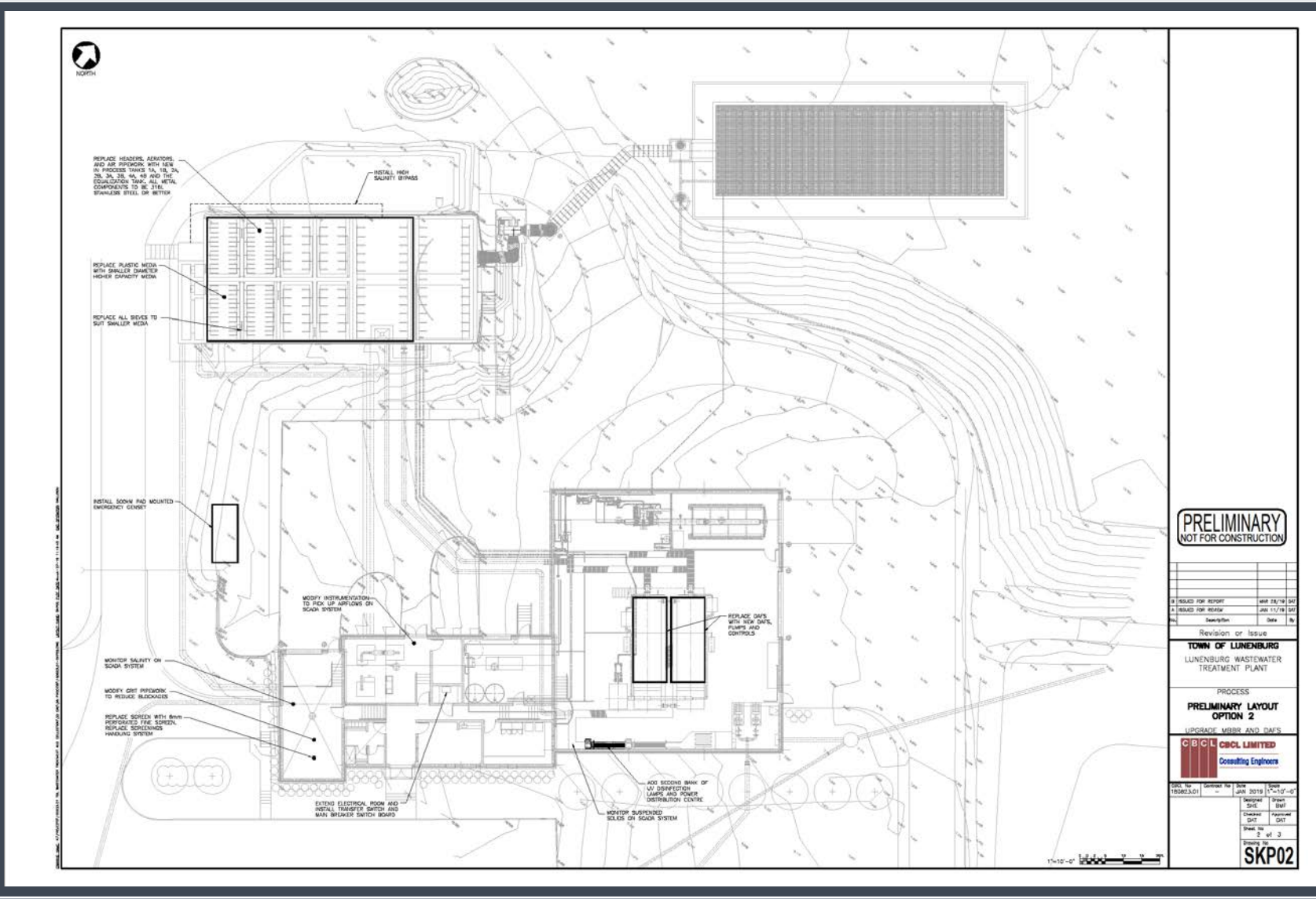
Option 1 – Capital Maintenance of Existing



Summary

- Replace screen/compactor
- Replace in-tank aeration system
- Replace media with fixed media
- Upgrade process instrumentation
- Replace DAF recirculation pumps
- Replace polymer dosing system (optional)
- Add bank of UV lights
- Add emergency generator

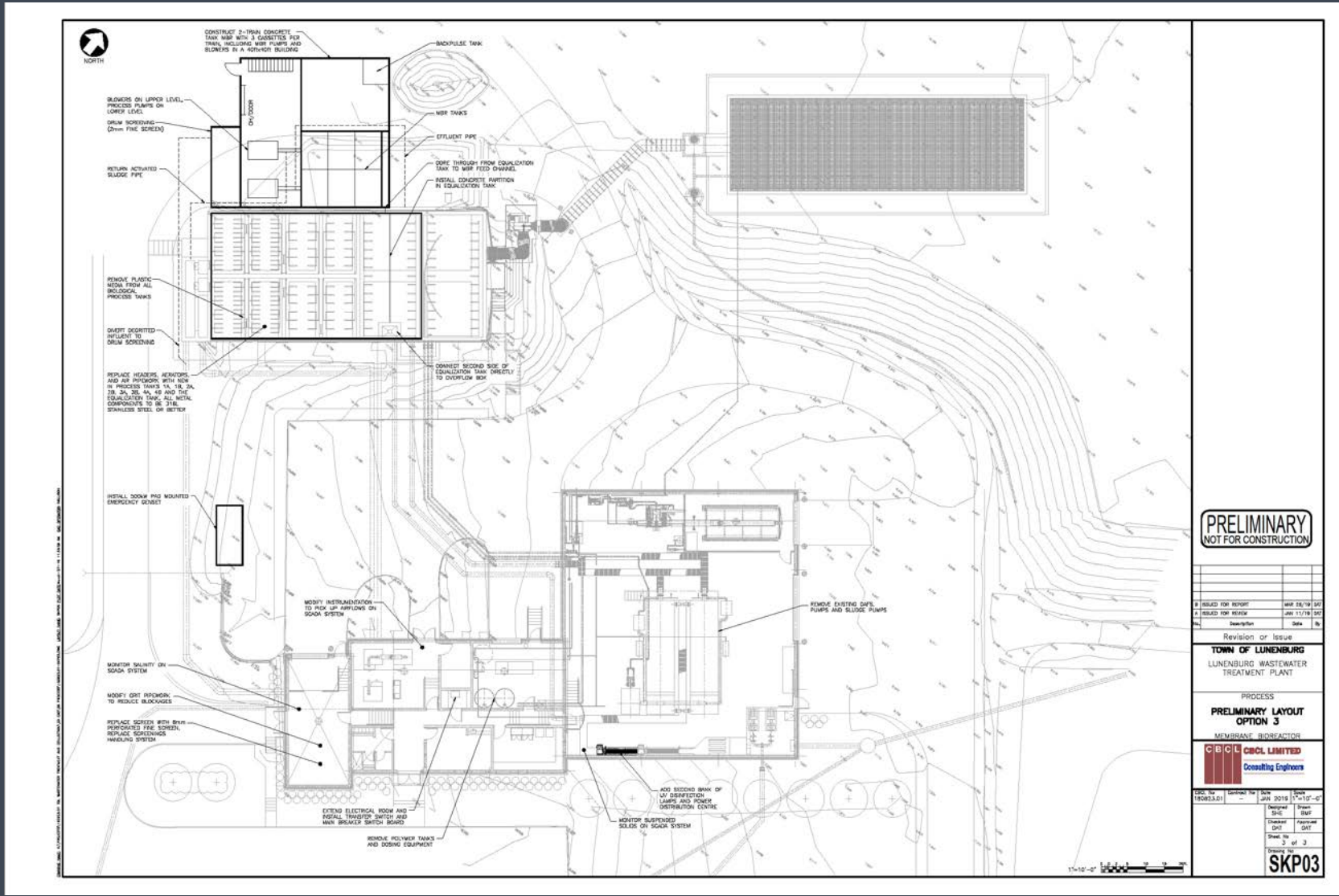
Option 2 – Upgrade Existing Process



Summary

- Replace screen/compactor
- Replace in-tank aeration system
- Replace MBBR media
  Upgrade process instrumentation
- Replace DAFs and polymer dosing system
- Add bank of UV lights
- Add emergency generator

Option 3 – Replace with MBR Process



Summary

- Replace screen/compactor
- Add 2mm drum screen
- Replace in-tank aeration system
- Remove media
- Upgrade process instrumentation
- Remove DAFs and polymer dosing system
- Add new building with membrane tanks and MBR process equipment
- Add bank of UV lights
- Add emergency generator

Opinion of Probable Costs

Category	Option 1 Capital Maintenance	Option 2 MBBR Upgrade	Option 3 MBR	Option A Outfall Extension
Site Works	$69,000	$177,000	$377,000	$1,125,000
Concrete	$0	$0	$526,000	$0
Buildings	$30,000	$40,000	$576,000	$0
Process Equipment	$811,000	$2,285,000	$2,025,000	$0
Mechanical	$890,000	$1,630,000	$2,056,000	$0
Electrical	$599,000	$854,000	$1,134,000	$0
Contractor Overhead	$192,000	$250,000	$335,000	$169,000
Subtotal	**$2,591,000**	**$5,236,000**	**$7,029,000**	**$1,294,000**
Design Development Contingency	$518,000	$1,047,000	$1,406,000	$259,000
Construction Contingency	$259,000	$524,000	$703,000	$129,000
Engineering	$259,000	$524,000	$703,000	$129,000
Total Capital Costs	**$3,627,000**	**$7,331,000**	**$9,841,000**	**$1,811,000**

Lifecycle Costs

Category	Option 1 Capital Maintenance	Option 2 MBBR Upgrade	Option 3 MBR	Option 1A Capital Maintenance & Outfall	Option 2A MBBR & Outfall
Annual Operations Cost	$454,000	$443,000	$582,000	$456,000	$445,000
Operations Cost Present Value*	$4,846,000	$4,729,000	$6,213,000	$4,868,000	$4,750,000
Capital Cost**	$3,627,000	$7,331,000	$9,841,000	$5,438,000	$9,142,000
Net Present Value	**$8,473,000**	**$12,060,000**	**$16,054,000**	**$10,306,000**	**$13,892,000**

* Present Value is the value of the Annual Operations Costs calculated over 25 years and discounted at 8% per year

** Includes allowances/contingencies for Design Development (20%), Construction (10%), and Engineering (10%)

Options Weighting

Each Option was scored and the scores were weighted according to priorities from Town staff, where a higher weighting means it is more important, and a higher score is better. Option 1 does not have a score on its own because it is unlikely to be a feasible option without an outfall extension.

Factor	Weight	Option 2	Option 3	Option 1A	Option 2A
Operations Cost	20%	1.00	0.40	0.80	1.00
Capital Cost	20%	0.60	0.20	0.80	0.20
Process Performance	25%	0.75	1.25	0.25	0.75
Ease of Operations	20%	1.00	0.80	0.40	1.00
Ease of Implementation	15%	0.15	0.45	0.60	0.15
Total	100%	**3.50**	**3.10**	**2.85**	**3.10**

Next Steps

- Preliminary Design
- Detailed Design
- Project Implementation

Wastewater Treatment & Collection System Study

Presentation
May 23, 2019

Thank you for your time

Questions?

Kelly Jardine

Subject: Town of Lunenburg WW Treatment & Collection System Study - Final WW Report

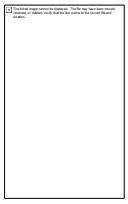
Morning Lee,

Follow-up to our earlier conversations, please see attached FINAL Report on the Wastewater Treatment System.

With respect to the Collection System Study, we are now in receipt of information provided by ABL (dwgs) and Sansom (PS reports). Municipal is in the process of reviewing.

Should you have any questions, or want to talk further on the matter, please do not hesitate to contact me.

Regards,



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"Solving Today's Problems with Tomorrow in Mind"

Town of Lunenburg
Wastewater Treatment Plant
Evaluation and Options Identification
Final Report

180823.01 ● Final Report ● March 2019

Prepared for:

Town of Lunenburg
A World Heritage Site

Prepared by:

CBCL LIMITED
Consulting Engineers

Issued as Final	D. Trudel	27-Mar-2019	D. Trudel
Issued as Interim Draft Report	D. Trudel	11-Jan-2019	D. Trudel
Issue or Revision	***Reviewed By:***	***Date***	***Issued By:***

CBCL LIMITED
Consulting Engineers

REGISTERED PROFESSIONAL ENGINEER
DATE 27/03/19
D. Trudel
9146
PROVINCE OF NOVA SCOTIA

Final Report: 180823.01

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Solving today's problems with tomorrow in mind

March 27, 2019

Mr. Lee Fougere, P.Eng.
Town Engineer
Town of Lunenburg
119 Cumberland Street
Lunenburg, NS B0J 2C0

Dear Mr. Fougere:

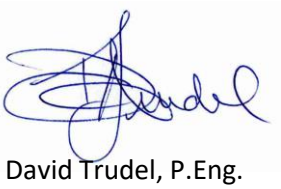
RE: Wastewater Treatment Plant Evaluation and Options Identification Report

Please see attached Wastewater Treatment Plant Evaluation and Options Identification Report, revised following comments from the Town.

Please do not hesitate to contact the undersigned with any questions.

Yours very truly,

CBCL Limited



David Trudel, P.Eng.
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Project No: 180823.01

CANADA'S BEST MANAGED COMPANIES

Contents

Appendices

CHAPTER 1 INTRODUCTION

1.1 Background

The Town of Lunenburg Wastewater Treatment Plant (WWTP) was constructed in 2003. The plant services a population of approximately 2,600 within the Town of Lunenburg (the Town) and adjacent serviced areas. Major elements of the system include the WWTP, gravity sewers (many of the combined type), sewage pumping stations, and associated force mains. While the plant is relatively new, much of the collection system infrastructure dates back to the early 1900s.

The Lunenburg WWTP was originally developed as a secondary treatment facility having a nominal hydraulic capacity of 0.5 USmgd. Unit processes within the plant include screening; grit removal; biological treatment using Moving Bed Bioreactors (MBBR); Dissolved Air Flotation (DAF) secondary clarification; Ultraviolet (UV) disinfection; and effluent pumping.

In order to address known and suspected problems in the Town's wastewater system, CBCL Limited (CBCL) was retained to investigate and assess the existing collection system and WWTP and develop upgrade options for each. The following report addresses the Town's Wastewater Treatment Plant.

CHAPTER 2 WASTEWATER TREATMENT PLANT

2.1 Overview and History

The existing Lunenburg Wastewater Treatment Plant (LWWTP) was built in 2003, as an innovative Moving Bed Bioreactor (MBBR) and Dissolved Air Flotation (DAF) plant. At that time, the collection system was rerouted from direct discharge to the harbour to being pumped to the plant via a series of pumping stations.

Since construction, the original sludge digestion system was replaced with a sludge dewatering press due to severe odour problems, but the other unit processes have stayed largely the same. A biofilter was installed in 2018 to address ongoing odour problems. In recent years, the plant has struggled seasonally with meeting some effluent criteria, in particular the bacterial criteria. This has come under public scrutiny due to increased bacterial testing in the harbour. The plant generally meets the solids and BOD (Biochemical Oxygen Demand) criteria, but there are occasional discharges of treated solids and polymer that look unsightly and lead to public dissatisfaction with plant performance. A description of the unit processes in the plant, the flow path taken through the plant, and the current asset condition is provided below. A process schematic of the existing secondary treatment process is shown in the figure below:

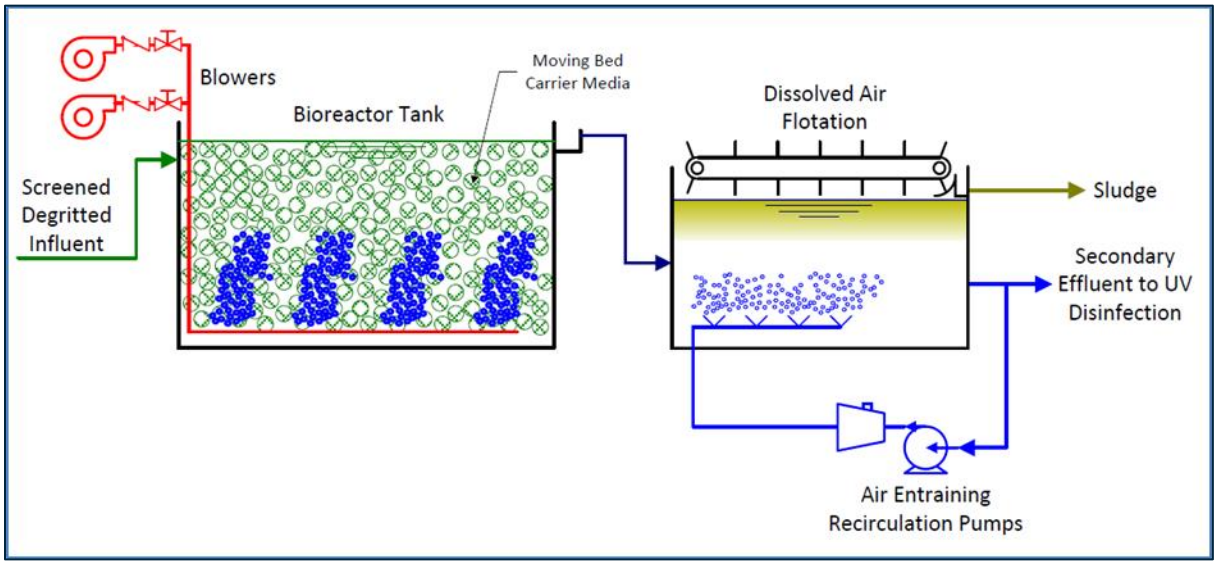

Figure 2.1: Schematic of Existing Secondary Treatment Process

2.2 Description of Plant

The existing plant is comprised of the following unit processes:

- Bar Screen.
- Aerated Grit Chamber.
- Dual-Train Moving Bed Bioreactor (MBBR) with Large Plastic Media.
- Equalization Tank.
- Dual-Train Dissolved Air Flotation (DAF) System.
- Ultraviolet (UV) Disinfection.
- Effluent Pump Station.
- Aerated Sludge Holding Tank.
- Fournier Rotary Press.

All flow to the plant is pumped from one of a number of pumping stations in the Town. Flow entering the plant passes through the headworks screen, then the aerated grit chambers in series, then flows by gravity to the bioreactor building. Here it flows through one of two treatment trains in parallel where soluble BOD is removed, and then enters a common equalization tank. It is batched in the equalization tank until the level rises to the point that the valve to one of the DAF units opens. Flow to the DAFs is by gravity. Polymer is dosed proportional to the flow rate into the flow stream upstream of the DAF units, and mixes in the remaining pipework before the DAF. The DAF provides additional mixing and the recirculation pumps produce tiny air bubbles which float the solids to the top where they are scraped to one end and over a weir to the sludge box. The underflow passes forward to an open channel leading to the UV disinfection system. The treated wastewater passes through one bank of UV lamps in series, then flows over a weir into the effluent pump station. The effluent pump station has two self-priming pumps which pump the effluent to the Front Harbour for discharge through a short outfall on the waterfront.

Sludge is pumped from the sludge boxes to the sludge holding tank. There it is aerated with coarse bubble aerators until it is dewatered using a rotary sludge press. The sludge press is used nearly every weekday to dewater sludge that is conditioned with polymer. The dewatered sludge is conveyed to a sludge cake storage bin in a separate room. Sludge is hauled offsite for disposal about once a week.

2.3 Assessment of the Existing Plant

A site visit to the plant was carried out by CBCL staff on August 15, 2018 to determine the condition and performance of the existing LWWTP assets. The plant operators John Lohnes and Taylor Rombaut gave a tour of all areas of the plant and discussed the overall performance. Several follow up visits were held to gather more data about particular items. During the initial site visit, samples were taken at a number of points in the treatment train and sent for analysis at a certified laboratory. Subsequent samples were taken by plant operators in order to calculate the current plant loads.

2.4 Existing Condition of Assets

The condition of the existing assets is described in the following subsections:

2.4.1 Headworks

Flow enters the plant in the headworks, flows in an open channel to the screen, and then to the grit chambers which are located under the floor. The headworks contains one fine screen (bar screen with 3mm spacing), one screenings dewatering unit, two aerated grit chambers, two grit pumps and one grit classifier. The condition of the existing screen and screenings dewatering unit (both original to the plant) appear to be acceptable although some wear is visible. The operators noted that debris larger than 3 mm in size regularly bypasses the screen and that equipment downstream gets blocked.

The original grit pumps were recently replaced. These have allowed grit removal to be brought back online after a significant period of time with no grit removal, but there are still some problems with blockages in the grit removal pipes due to the current piping layout. This problem could be exacerbated by poor performance by the screen. No notable issues were identified with the performance of the grit chambers themselves, nor with the grit classifier.

The headworks area has recurring problems with hydrogen sulfide concentrations in the air, which cause corrosion and environmental concerns. The ventilation system for the headworks was recently connected to the biofilter, and once this upgrade is complete, the conditions within the headworks should be significantly improved.

2.4.2 Bioreactor Tanks

The bioreactor is in a building with an FRP cover located behind the main plant. Similar to the headworks, the ventilation system has also recently been connected to the biofilter. This building contains widespread evidence of corrosion, due to problems with hydrogen sulfide build up and high salinity in the wastewater. The grating in this building shows signs of deterioration and is getting to the point that it may no longer be safe to walk on.

The bioreactor consists of two trains of four tanks each, all containing large plastic media that is mixed and aerated by the submerged aerators. The first two tanks in each train have fine bubble aerators, and the second two tanks have coarse bubble aerators. Each train of the bioreactors can be isolated for maintenance.

The current condition of the aeration piping, aerators, and media in the bioreactor tanks appears poor. A number of issues with the bioreactor equipment were identified, including worn-down media (approximately 50% of original size, and sometimes smaller), and uneven aeration patterns in the concrete basins, indicating that the aerators were not working properly. The aeration pipework had visible holes in it and the control valves could not be operated because the handles were no longer strong enough to turn the valves. There was widespread evidence of corrosion visible. The aerators, pipework, and media are all original to the process. The heavy wear visible on the media indicates that this media may not suitable for this application. The corroded nature of the metal throughout this building indicates that the typical materials of construction used were not sufficiently corrosion-

resistant for this application, dealing with high concentrations of salinity (discussed in more detail below), in combination with inadequate ventilation.

2.4.3 Equalization Tank

A common equalization tank follows the two bioreactor trains, which is aerated with coarse bubble aerators. The equalization tank has a high level overflow which bypasses the DAF and rejoins the flow prior to UV disinfection. Since the tank is common to both bioreactor treatment trains, the equalization tank can only be isolated by bypassing the bioreactor altogether.

The equalization tank aerators and pipework are in similarly poor condition to the bioreactor tanks. The backup level switches for high level alarm in the equalization tank are not functional.

2.4.4 Dissolved Air Flotation Units

The partially treated flow leaves the equalization tank and flows by gravity to the two parallel DAF units. Each DAF unit has a design capacity of 1040 USgpm, for a combined total capacity of 2080 USgpm. The DAF units consist of two open-top tank clarifiers, and use dissolved air for separation of suspended solids.

As the equalization tank effluent flows to the DAF units, polymer is dosed proportionally to the inlet flow. The polymer and flow mix with the recycled air-water mixture prior to the inlet compartment.

The recycled stream is transferred through a proprietary recirculation pump, and flows through an air saturation system to generate microbubbles, ranging in size from 30 – 50 µm in diameter. The microbubbles adhere to the suspended solids and flocs. Fast-rising particles rise to the top of clarifier and attach to the sludge blanket, to eventually be skimmed off. Heavy particles settle in the hopper at the bottom of the clarifier and are removed by an intermittent drain that conveys the settled solids to the sludge holding tank. Slow-rising particles are separated out by the proprietary corrugated plates located in the clarifier. The clarified water is discharged via effluent channels and flows through open channels to the downstream UV disinfection unit. A portion of the clarified water is recirculated through the recirculation pumps to produce the air-water mix.

The DAF clarifier tanks are in reasonably good shape; however, the proprietary recirculation pumps require frequent rebuilding and pressure setting adjustments by operators. The pumps are currently producing turbulent air-water mixtures and potentially discharging poor quality microbubbles. The corrugated plates located inside the clarifier have been reported to be a maintenance issue as solids accumulate between the plates and reduce the clarifier's capacity, limiting treatment efficiency.

The polymer makedown system uses dry polymer and potable dilution water to mix the solution. The makedown system has limited automation and control; therefore, it is difficult to verify the activation of the solution. Currently, the DAF clarifiers are dosing large volumes of polymer, likely contributing to suspended solids and floc formation downstream of the DAF units and at the outfall. Research indicates that increased salinity (discussed below) can hinder the efficacy of polymer activation and floc formation, which could also contribute to the increased polymer dosage concentrations.

Currently, the treated DAF effluent discharges to an open channel flowing to the downstream UV disinfection unit. The turbulent mixing of the effluent as it drops from the discharge weir in the DAF to the open channel generates foam containing suspended solids that regularly overtops the channel and accumulates on the process room floor. This issue is a significant maintenance item, as the channels require vacuum-truck cleaning frequently. Elevated polymer dosages and the piping configuration of the DAF clarifier discharge are likely the cause of the open channel foaming.

2.4.5 Ultraviolet Disinfection

The effluent from the DAF units flows in an open channel to an ultraviolet (UV) disinfection system with a single bank containing a total of 32 bulbs. Following disinfection, the effluent flows over a weir to the effluent pump station.

This unit is in good condition, and is designed to disinfect the peak flow at 65% UVT to an average of 200 count fecal coliforms/100 mL of effluent. The operators report problems meeting the fecal coliform effluent requirements periodically. The requirements are that 80% of samples meet 1000 count/100 mL, with no sample exceeding 2000 count/100 mL. In 2017, a total of 11 samples exceeded 2000 count/100 mL, beginning in June 2017, and the overall percentage of samples passing was 74%. In 2018, a total of 9 samples exceeded 2000 count/100 mL, and the overall percentage of samples passing was 79%. Investigations showed that the UVT% of the effluent is often less than 40%, and at this value, the existing unit is not capable of emitting enough UV light to disinfect the effluent to the levels required.

There is no cleaning area for the bulbs, so they are cleaned near the UV equipment. This area has noticeable damage to the concrete floor due to the application of Lime-away here.

2.4.6 Effluent Pump Station

Effluent from the plant is pumped to the outfall in the Front Harbour by two self-priming pumps in the effluent pump station. These appear to be in good condition, and no significant issues are noted.

2.4.7 Outfall

The effluent is pumped up the hill towards the Outfall, which is located in the Front Harbour by the Inshore Fishermen's Wharf. This is a very public and visible location for the outfall. The treatment process uses substantial amounts of polymer which can cause foaming in the plant and at the outfall. The solids/polymer mixture may sometimes look like sludge and leads to complaints and misunderstanding from the public, some of whom believe that raw sewage is still being released from the outfall under normal operating conditions. Although the effluent quality is typically good (secondary effluent quality, in line with both federal and provincial standards), the outfall has low potential for mixing and dispersion, and direct public contact with the undiluted effluent is possible.

2.4.8 Sludge Holding Tank

The sludge holding tank is located in the bioreactor building adjacent the equalization tank. Sludge is pumped to the tank using a pair of progressive cavity pumps. There is a macerator on the suction line from the sludge collection tanks on the DAFs to the pumps. The macerator was installed in 2017 to prevent blockages in the sludge return line from hair and rags. The operators report that the macerator produces too much head loss and starves the pumps, so the macerator is routinely bypassed.

The aerators in the sludge holding tank were replaced last year after significant problems were encountered with corrosion within the rotary sludge press. The original coarse bubble aerators were unable to deliver enough air to maintain aerobic conditions in the sludge tank. There were problems in the summer with the pH of the sludge dropping from acid formation in the anaerobic sludge holding tank, as well as many odour complaints. The acidic sludge destroyed the screens in the rotary sludge press, which then required replacement. Following the aerator replacement, the pH in the sludge tank was controlled, and the sludge could be dewatered without damage to the sludge press. The sludge return line has not suffered blockages since the aerators were replaced.

2.4.9 Rotary Sludge Press

The sludge dewatering system consists of polymer makedown and injection into the sludge stream, followed by a flocculation tank and a rotary sludge press. The rotary sludge press receives sludge from the holding tank, conditioned with polymer, and presses out the excess water. This equipment was installed following the removal of the two original Auto-thermal Thermophilic Aerobic Digesters (ATADs). The ATADs resulted in unacceptable odours at the plant. The rotary sludge press works well, according to the operators, and they appear to be in very good condition. They are used nearly every weekday, but there is still capacity to dewater additional sludge if necessary. The capacity of the unit installed is upgradeable by 50% by installing one new channel.

2.4.10 Odour Control Equipment

The odour control system includes a ventilation fan that draws odorous air from the headworks, sludge cake room and bioreactor building to supply the biofilter bed, a high-pressure humidification pump, and a large biofilter bed covered with root mulch, which slowly breaks down as the bacteria feed on it. This equipment was installed in 2018 and is in very good condition, although there are still some outstanding construction deficiencies. It is anticipated to require major maintenance in about 5 to 7 years when the root mulch will need to be replaced.

2.4.11 Asset Condition Summary

The condition of existing assets in the plant is mixed. Some areas have assets in good condition, while others are in need of capital maintenance, which is the selective replacement of assets or pieces of assets at the end of their useful life. A number of items of existing equipment shows significant signs of wear, and replacement of this equipment is required to keep it performing at a satisfactory level into the future. Without a significant level of capital maintenance, the performance of the plant is likely to continue to drop until it can no longer meet the effluent requirements. When a plant is new, as it was in 2003, there is often a “honeymoon” period where very little maintenance beyond routine periodic maintenance is required. After 10–15 years, more substantial capital maintenance to mechanical and electrical assets is typically required to keep the plant running as originally intended.

2.5 Current Wastewater Treatment Performance

The wastewater treatment plant is required to meet the following effluent criteria, under Provincial Approval to Operate 2012-082710-A01 and the Federal Wastewater Systems Effluent Regulations (WSER):

Table 2.1: Effluent Requirements

Description	Provincial Limit	Federal Limit
Effluent BOD	20 mg/L	25 mg/L
Effluent TSS	20 mg/L	25 mg/L
Effluent Fecal Coliforms	1000 MPN/100 mL	N/A
Effluent pH	6.5–9	N/A
Effluent Un-ionized Ammonia	N/A	1.25 mg/L

Compliance with the provincial effluent criteria requires that 80% of annual samples are within the limit, and that no sample be more than twice the limit. The permit currently reads that the Fecal Coliform limit is 200 MPN/100 mL, but correspondence with NSE indicates that this was changed inadvertently when the permit was renewed in 2012, and that there was no intent by NSE to tighten this limit beyond 1000 MPN/100 mL, which would require replacing the UV system with a much larger one compared to the original design criteria. The Town has applied for an amendment to this Approval which would revert the text to 1000 MPN/100 mL, at 80% compliance. This limit is statistically similar, in terms of equipment required, to a limit where the average must be 200 MPN/100 mL.

In addition to the provincial requirements, the Federal limits apply. Compliance with the Federal regulations requires that the quarterly average for each of BOD and TSS is less than or equal to the numeric limits. The un-ionized ammonia limit may not be exceeded.

The Lunenburg WWTP complied with the Federal regulations in 2017. The Provincial limits were met for pH and TSS in 2017, but not for BOD due to one sample more than twice the numerical limit, and also not for Fecal Coliforms, due to not meeting the percentage limits (74% of samples in compliance) and also having multiple samples at more than twice the numerical limit (using 1000 MPN/100 mL, as agreed with NSE to be the appropriate limit notwithstanding the text of the Approval. Data examined for 2018 appears to follow a similar pattern, with a non-compliant BOD sample, multiple non-compliant Fecal Coliform samples, and a non-compliant TSS sample, all of which were more than twice the numerical limit.

CHAPTER 3 WASTEWATER TREATMENT OPTIONS

3.1 Design Criteria

Flow and load data were collected and analysed in order to determine the design criteria for the upgrade options, as well as to compare the current conditions to the original design capacity. The design flows and loads were developed based on the following information:

- Flow data for the past year from flow meters on the DAF feed pipes.
- Influent samples during August and September 2018.
- Salinity measurements taken at the plant by the operators.
- Effluent UVT% measurements taken by CBCL staff.

The flow data from the flow meters on the DAF feed pipes was used because this is the only location in the plant where there are flow meters for the main wastewater flow. The SCADA system also stores a calculated flow value from the level measurement in the Equalization tank. The formula by which it is calculated does not clearly relate to the physical conditions on site, but the values are very similar, so the flow meter data was selected. The flow data is shown in Figure 3.1 below.

The flow data, when reviewed in conjunction with rainfall data, shows clear evidence of infiltration. Nonetheless, the peak day flow is lower than the design peak day flow, and has been for all years between 2011 and 2018, for which we were able to review the data. The average day flow is higher than the design average day flow, but investigation of the tank capacities and blower air available indicates that the plant has adequate capacity to treat current average day flow to the required levels.

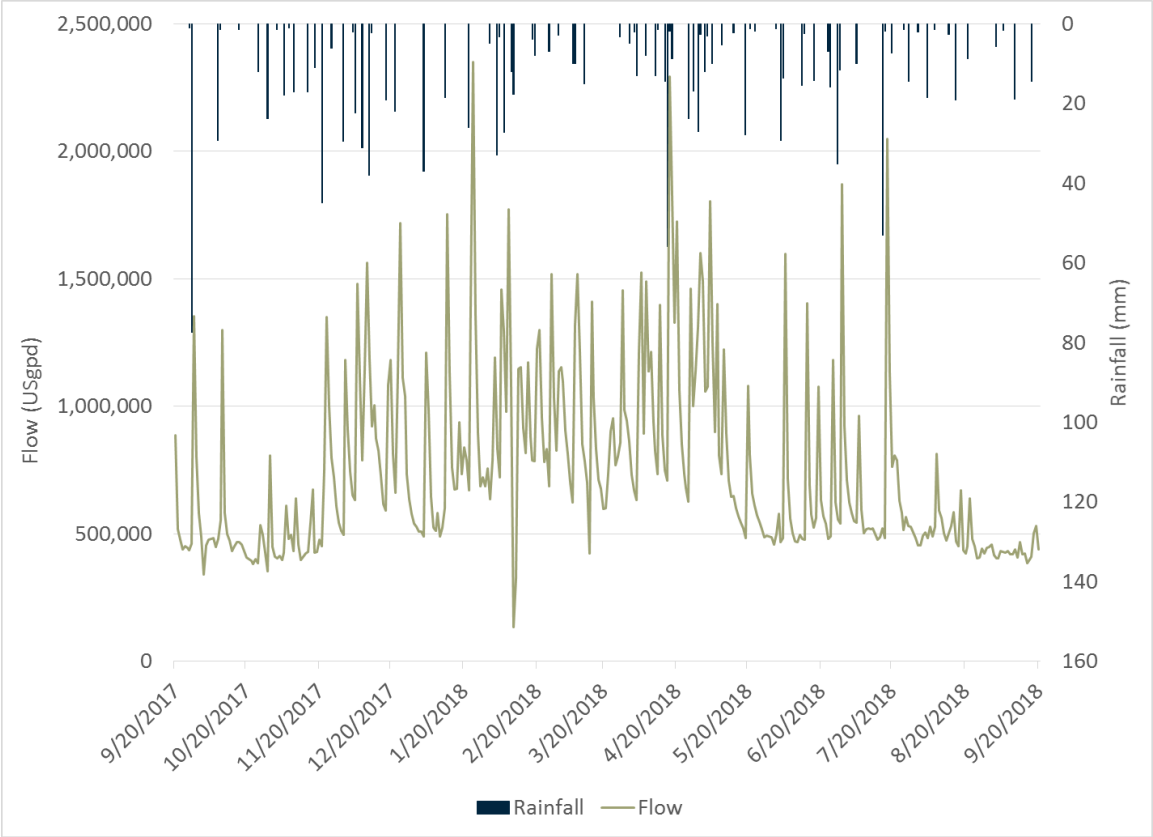

Figure 3.1: Lunenburg WWTP Flow Records and Rainfall Data

Influent samples from the plant were collected in August and September 2018, and tested for CBOD, TSS and Ammonia (NH_3). The sample data were used to calculate the current loading to the plant. The table below shows the current flows and loads from which the options were sized. The full design peak flow was selected even though recorded peaks are lower than this so as not to reduce the available hydraulic capacity. Average plant flows appear to be falling over time, not rising, so we have not included an allowance for growth. Furthermore, reduction of inflow would be a very beneficial way to lower flows if there is the possibility to do this.

Table 3.1: Design Flows and Loads

Parameter	Average	Peak
Flow	759,500 USgpd (2,900 m^3/day)	3,000,000 USgpd (11,400 m^3/d)
BOD Load	160 kg/d	320 kg/d
TSS Load	300 kg/d	600 kg/d
NH3 Load	38 kg/d	75 kg/d

Inflow is significant at the plant, and causes some operational and maintenance challenges. Some of the inflow is suspected to be seawater, and the plant has high concentrations of salinity in the influent and the effluent, compared to typical wastewater, which averages less than 1 part per thousand (ppt). The plant salinity averages 3 ppt, and spikes occasionally, at times correlated with high tides. Furthermore, the size of the spike is also correlated with the height of the tide: higher concentrations occur during higher-than-typical high tides. For reference, seawater has a salinity of 35 ppt. The salinity data from the plant is shown in the following figure:

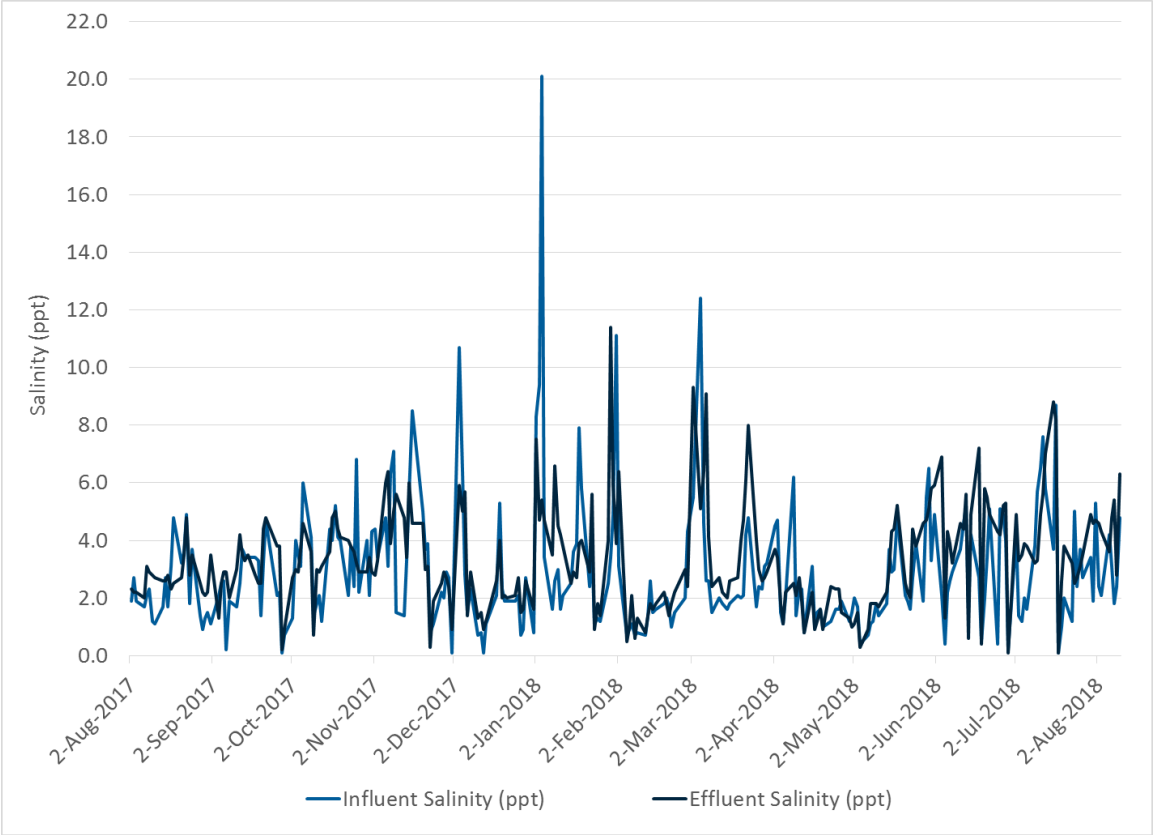

Figure 3.2: Lunenburg WWTP Influent/ Effluent Salinity

If the salinity of the wastewater can be lowered, the life of the components in the plant would be extended and the process would also benefit from improved performance and stability. Varying salinity has a negative effect on the microbes within the bioreactor. When salinity rises 50%, research shows that about 30% of the bacteria are typically inactivated or killed, and when it rises more than 100% (above 6–8 ppt, which happened at least 8 times between August 2017 and Aug 2018) the majority of the biomass would likely be negatively affected, and the treatment capacity would be significantly reduced for a period of time until it could regenerate. There are also effects on the DAF train when salinity is high, because the effectiveness of the polymer is likely reduced.

In addition to salinity measurements taken by the plant operators, UVT% was monitored by CBCL staff over a period of several months to provide design data for the UV disinfection system. The data indicated that seasonally, the UVT% is much lower than the design value of 65%. This means that the effluent does not transmit UV light well enough to achieve the design disinfection rates, and this is reflected in the poor performance of the disinfection system during the period when the UVT% measurements were low. In order to achieve the required permit disinfection rates, either the capacity of the system must be increased to allow the required dose to be maintained even when the transmissivity of the effluent is low, or the component of the effluent that is causing the low UVT% must be identified and prevented from entering the wastewater. This may be possible but the problem has not yet been pinpointed. It may result from coffee and/or brewery by-products entering the sewer. These can contribute to lower UVT%, and are likely to be present within the Town's wastewater. As the flow through the system increased, the UVT% increased significantly until it met the design UVT%, resulting in effluent samples than met or exceeded regulatory requirements.

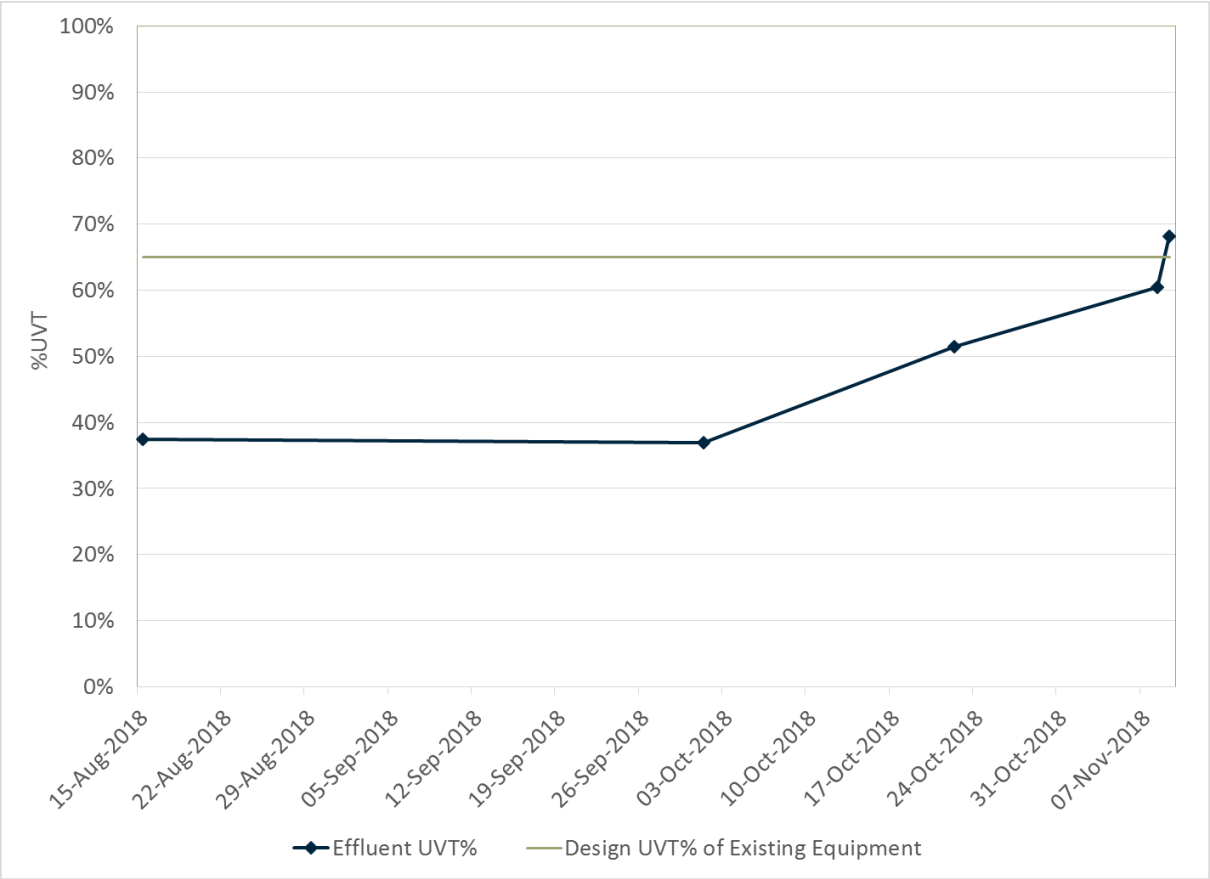

Figure 3.3: Lunenburg WWTP Effluent UVT%

3.2 Upgrade Options

There are several options for upgrading the plant to allow it to perform more reliably. These include capital maintenance (replacement of items that are at the end of their useful life), replacing the equipment with improved equipment, and replacing the equipment with a different type of process. These are each described in more detail below.

Due to the high salinity of the incoming wastewater, the material selected for each option is recommended to be highly corrosion resistant. A minimum of 316L stainless steel is recommended for all exposed metal in the headworks and bioreactor building, whether above or below the waterline. Alternatively, cathodic protection may be used for large, static structures such as tanks.

It is recommended that the selected option is assembled in a complete package instead of being done piecemeal, in order to ensure a concerted effort, be as efficient as possible, and confirm that all process benefits are achieved in the short term rather than upgrading slowly and continuing to experience operational challenges extending into the future.

3.2.1 Option 1: Capital Maintenance Of Existing Process

This option would replace or improve the most critical items in the plant which are causing performance and maintenance issues. The most cost-effective way to replace the media in the bioreactor tank is use

fixed-in-place (stationary) media and change the process from an MBBR into a Fixed Activated Sludge (FAS) process. The existing media type is still available but has not worn well so far and is not recommended for reuse. Stationary media is less subject to wear and would be installed in the existing tanks. The plant would continue to use the existing DAF solids removal downstream. This is anticipated to generally meet the existing effluent quality objectives with regard to BOD and TSS (less than 20 mg/L each for BOD and TSS, less than 1000/100 mL for fecal coliforms), with polymer use possibly reduced. A process schematic for this option is shown in the figure below:

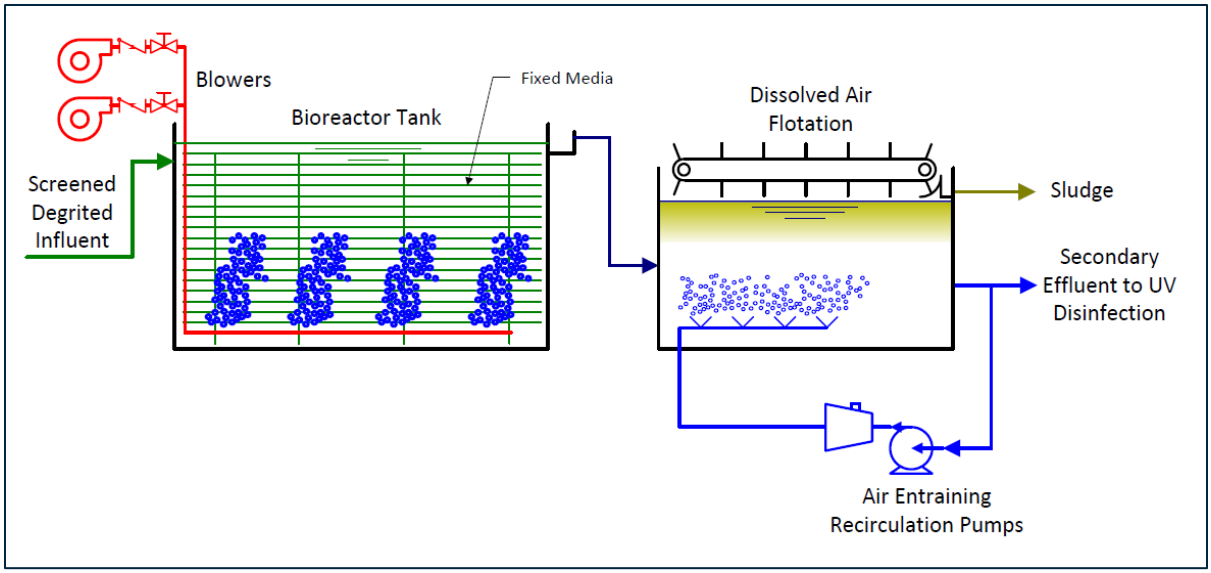

Figure 3.4: Process Schematic of Option 1 Capital Maintenance Secondary Treatment Process

The recommended scope of work is for this option is listed below:

- Replace screen and screenings handling with a new 316L stainless steel 6 mm perforated plate screen (with improved capture ratio compared to the existing bar screen) and washer-compactor, in order to improve the screenings removal and dryness, and to prevent large debris from passing the screen which jams the grit-removal pipework and clogs pumps.
- Replace the plastic media, air pipework and aerators in the bioreactor tanks with new, fixed-in-place media and stainless steel pipework and aerators, to provide additional surface area for biomass and improved aeration performance and control, within existing concrete tanks.
- Add or upgrade instrumentation to provide measurement of air flows, influent salinity, and effluent suspended solids, all connected to SCADA system, as well as a handheld UVT meter, in order to provide improved process monitoring.
- Replace both DAF recirculation pumps with new.
- Process optimization of DAF system by manufacturer Poseidon, to reduce polymer use and prevent solids and polymer carryover.
- Replace polymer makedown system with more efficient system that can automatically adjust polymer dose according to performance (this may not be required depending on the results of the optimization process).
- Add an additional bank of UV disinfection lamps to disinfect properly during low-UVT events as documented during the summer of 2018.

- Add an emergency generator, including enlarging the electrical room, to run critical process equipment and prevent untreated discharges of wastewater to Back Harbour.

3.2.2 Option 2: Upgrade Existing Process to Increase Capacity and Flexibility

This option would replace the main components of the existing process with new, in order to improve the performance and provide better operational controls. This is anticipated to reliably meet the existing provincial effluent requirements for BOD, TSS, and Fecal Coliforms (less than 20 mg/L each for BOD and TSS, less than 1000/100 mL for fecal coliforms), with polymer use significantly reduced. A process schematic for this option is shown in the figure below:

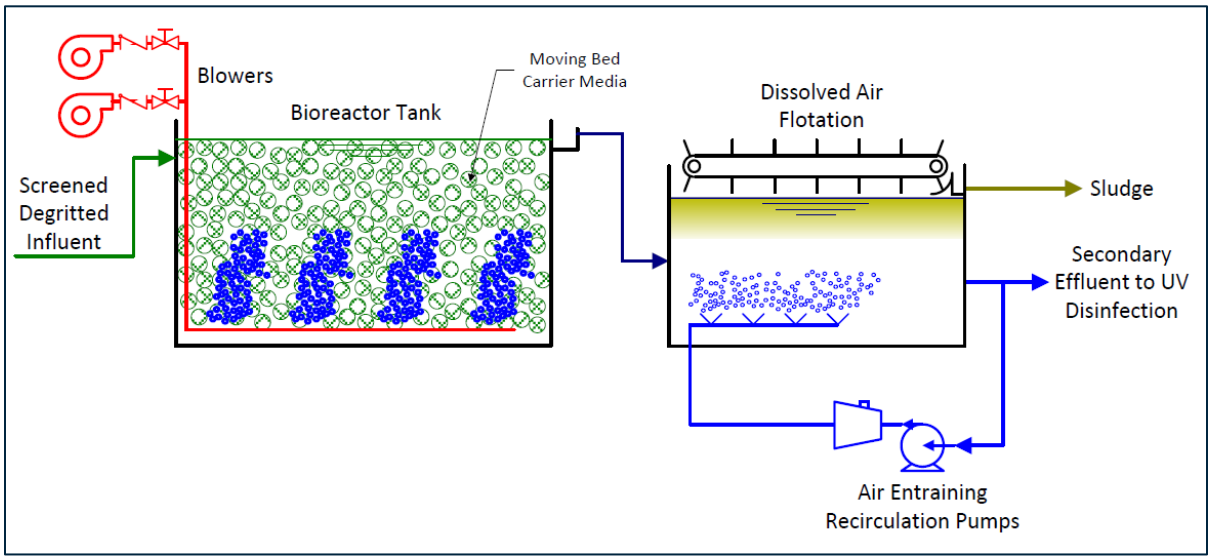

Figure 3.5: Schematic of Option 2 MBBR Secondary Treatment Process

The recommended scope of work is for this option is listed below:

- Replace screen and screenings handling with a new 316L stainless steel 6 mm perforated plate screen (with improved capture ratio compared to the existing bar screen) and washer-compactor, in order to improve the screenings removal and dryness, and prevent large debris from passing the screen which jams the grit-removal pipework and clogs pumps.
- Replace the plastic media, air pipework, aerators, and sieves in the bioreactor tanks with new moving bed media, stainless steel pipework, aerators and sieves, to provide additional surface area for biomass and improved aeration performance and control, within existing concrete tanks.
- Add or upgrade instrumentation to provide measurement of air flows, influent salinity, and effluent suspended solids, all connected to the SCADA system, as well as a handheld UVT meter, in order to provide improved process monitoring.
- Replace both DAF tanks and recirculation pumps with new units with improved flocculation, including replacement of the polymer makedown system with one that only runs during high flow events, in order to reduce polymer use.
- Add an additional bank of UV disinfection lamps to disinfect properly during low-UVT events as documented during the summer of 2018.
- Add an emergency generator, including enlarging the electrical room, to run critical process equipment and prevent untreated discharges of wastewater to Back Harbour.

The existing MBBR/DAF process can be upgraded using the same general concept, concrete tank capacity, and blowers, but with additional biological capacity, improved controls flexibility, and a single source design and equipment supply for the MBBR/DAF process in order to access single-point ongoing process support from the supplier.

3.2.3 Option 3: Replace with MBR Process

This option would replace the main components of the existing process with an MBR (Membrane Bioreactor) process, in order to significantly improve the effluent quality. This would include changing the process in the bioreactor tank from an MBBR into an Activated Sludge (AS) process, with membrane solids removal downstream. This is anticipated to exceed the existing provincial effluent requirements for BOD, TSS, and Fecal Coliforms (approximately 5–10 mg/L each for BOD and TSS, less than 1000/100 mL for fecal coliforms), with polymer use eliminated. A process schematic for this option is shown in the figure below:

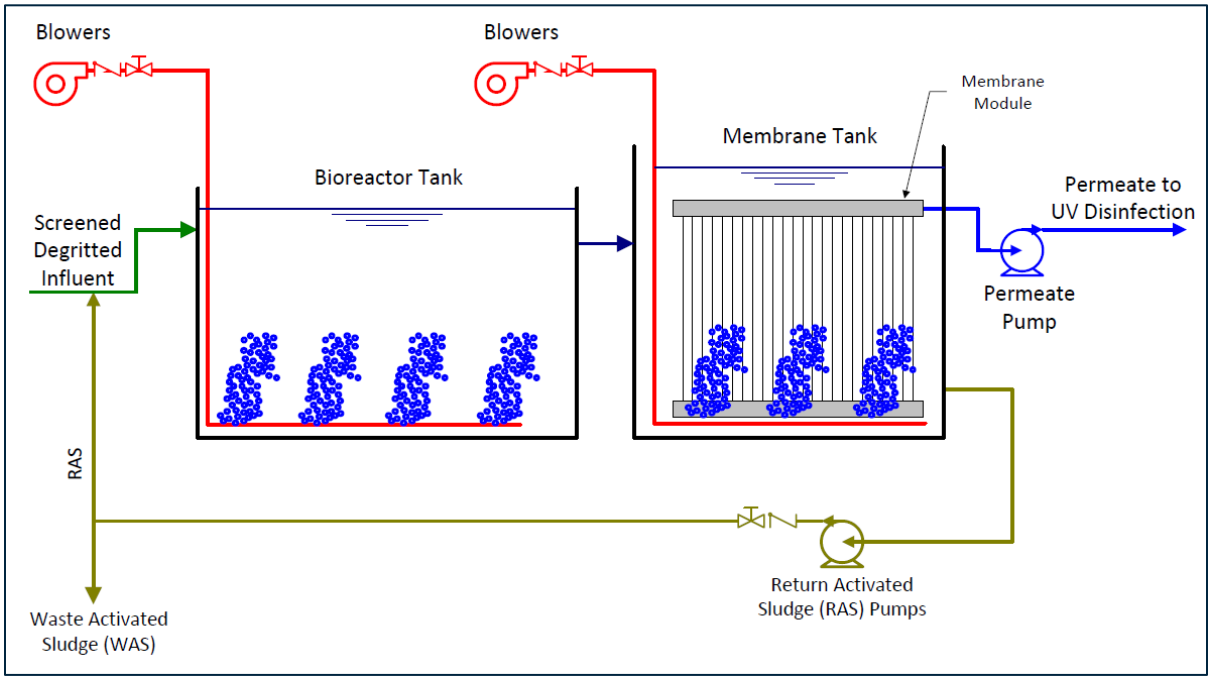

Figure 3.6: Schematic of Option 3 MBR Secondary Treatment Process

The recommended scope of work is for this option is listed below:

- Replace screen and screenings handling with a new 316L stainless steel 6 mm perforated plate screen (with improved capture ratio compared to the existing bar screen) and washer-compactor, and install a new 316L stainless steel 2 mm drum screen in the MBR building, in order to improve the screenings removal and dryness, and prevent large and intermediate debris from passing the screen which could damage the membranes.
- Remove the media, and replace the air pipework and aerators in the bioreactor tanks with new stainless steel pipework and aerators, to transform the process to activated sludge (no carrier media), within existing concrete tanks.

- Add or upgrade instrumentation to provide measurement of air flows, influent salinity, and effluent suspended solids, all connected to the SCADA system, as well as a handheld UVT meter, in order to provide improved process monitoring.
- Remove both DAF tanks and recirculation pumps and add membrane tanks for clarification in a new building, including additional process blowers, membrane cleaning equipment, and Return Activated Sludge (RAS) pumps.
- Add an additional bank of UV disinfection lamps to disinfect properly during low-UVT events as documented during the summer of 2018.
- Add an emergency generator, including enlarging the electrical room, to run critical process equipment and prevent untreated discharges of wastewater to Back Harbour.

3.2.4 Supplementary Option A: Extend Existing Outfall

The existing outfall is located under the Inshore Fishermen's Wharf, which is a very public location, and one that does not have appear to have good mixing. There are occasional discharges of suspended solids and polymer that look unsightly. The wastewater does not currently reliably meet the provincial bacterial effluent requirements with the existing UV system capacity. In addition to improving the effluent quality, particularly the disinfection performance, by implementing one of the three options above, it is possible to extend the outfall to a location with less public contact. This is not a standalone option.

The outfall extension would consist of about 920 m of HDPE pipe laid on the harbour floor adjacent the dredged channel, weighted with concrete collars and fitted with diffuser ports at the end to aid in mixing. The head losses associated with the extension would need to be evaluated and the effluent pumps could be affected. This is a very preliminary assessment of the outfall extension. Additional work on the dilution and mixing available will need to be done to determine the optimal length of outfall. A permit must be obtained, and this may require an Environmental Impact Assessment, and possibly mitigating steps as well.

An outfall extension is recommended if Option 1 is chosen. If Option 3 is chosen, it is unlikely that outfall extension would be required, since the overall effluent quality would be significantly improved, and the polymer use would be eliminated. In the case of Option 2, the WWTP improvements could be implemented first, and the outfall extended only if it still seemed necessary after the disinfection was improved and polymer use was reduced. Outfall extension alone does not help with maintaining regulatory compliance, and would not receive approval on its own.

3.3 Comparison of Options

There are considerable differences between the options outlined above, in terms of performance, ease of operations, and operations cost (including chemicals, replacement items, and sludge disposal). These will be discussed in the section below.

3.3.1 Process Performance

In terms of performance, the best effluent quality would be produced by Option 3, the MBR process. This process can produce tertiary quality effluent, and is the gold standard for effluent quality in wastewater treatment. The effluent from this process would contain no polymer, and would

consistently be below 10 mg/L for both BOD and TSS, since all effluent must pass through a membrane. MBR effluent is readily disinfected and would meet and exceed all provincial and federal standards. This option would not require extension of the existing outfall, due to the high quality effluent and the fact that polymer would no longer be required, the two main factors that cause issues at the moment.

Option 2 would provide effluent quality reliably meeting provincial and federal requirements. It would be easily disinfected. It would require polymer use less often, and would therefore pose less risk of releasing polymer to the harbour, which is not a regulatory issue but appears to add to public perception issues. With this option, the Town could take a phased approach to the effluent outfall, upgrading the plant first and extending the outfall only if and as much as needed.

Option 1 would produce effluent which meets federal requirements, and usually meets provincial requirements, except during peak month conditions when it might occasionally not fully meet provincial requirements. An outfall extension would be recommended in tandem with the plant upgrades to remove the possibility of direct public contact with the effluent, and reduce the occurrence of public perception issues, as well as providing good dilution. The plant could produce better quality effluent than it currently does, but the possibility will remain of solids and/or polymer carry over from the existing DAFs. The risk of bacterial standards not being met would be greatly reduced with an expansion of the UV system.

3.3.2 Ease of Operations

Option 1 would be somewhat easier than the existing plant to operate and maintain, but would not have the additional outside process technical support potential of Option 2 (completely integrated package). Both of these would be fairly similar in tasks and required staffing to current operations.

Option 3 operation would be considerably different than the existing procedures. It might require an operator with Class III certification, and it might also require an additional maintenance person. Its operation would have some similarities to the Town's Water Treatment Plant, including scheduled membrane cleans, and periodic membrane replacements. It would also require more frequent monitoring of the bacterial populations in the bioreactor. There would be less risk of solids release from the system, and no need to use polymer except for sludge dewatering. The dewatering of sludge might be somewhat more difficult, because waste activated sludge from an MBR system has greater volume to start with and won't dewater to the same extent as DAF sludge.

3.3.3 Ease of Implementation

The construction of any of these options would require close coordination and ongoing communication between the contractor and operators. A "Temporary Authorization" must be obtained from Environment Canada under the terms of the WSER legislation, and an Approval to Construct and Operate must be obtained from NSE before beginning. Both should be applied for well in advance of construction. The contractor will be required to develop a thorough construction plan in consultation with the operators, with the intent of minimizing service disruptions. The plan will account for operational flexibility within the current system, scheduling (i.e., periods of low flow), as well as mitigation of longer-term interruptions with mobile treatment equipment. Some interruptions are inevitable during construction, and regulators recognize this.

In order to minimize interruptions, it may be beneficial to add additional pipework, etc. during construction, to allow more specific bypass methods both during and after construction. For example, a connection could be made from the overflow at the head of the bioreactor tank to the DAF supply pipework, in order to bypass only the biological processes while maintaining flows to the DAFs. A duplicate pipe from the EQ tank to the DAFs could be constructed to allow the control valve for each DAF to be taken out of service without affecting the feed to the other DAF.

Option 1 would involve the fewest changes, and therefore would be relatively straightforward to implement. The UV system expansion would require temporary bypass pumping of the effluent for a short period of time while the unit was fitted into the existing channel. Similarly, the replacement screen would fit into the existing channel, and should be installed and commissioned before replacing the media in the bioreactor. The DAF recirculation pumps could be replaced with little difficulty, one at a time, and then the optimization work on the DAFs could take place. Additional instrumentation could be installed with little or no interruption to the existing process. Replacing the aeration equipment and the media can be done one train at a time. Replacing the aeration system in the equalization tank also requires temporary bypass pumping for a period of time, in order to pass bioreactor effluent forward to the DAFs. Installing the backup generator requires expanding the electrical room to provide space for the transfer switch, and relocating the equipment on the back wall. This work can be managed by the contractor without having to bypass parts of the treatment process for more than limited periods of time. Commissioning would be relatively straightforward, because most of the items are familiar to the operators.

Option 2 is more complex to implement, because in addition to the work outlined in Option 1, it includes the replacement of the DAFs, as well as the replacement of significant parts of the control system of the plant. Coordination would be required with the Town's system integrator (monitoring and trending of vendor control cabinets).This would require careful management by the contractor, in consultation with NSE, and could be scheduled so as to reduce negative effects on the receiving water. Commissioning would be less straightforward than Option 1, due to some changes in the systems that the operators would need to gain familiarity with, but the additional automation and remote monitoring and support available from the suppliers would aid in this transition.

Option 3 requires the screen replacement and UV system expansion, along with the backup generator and instrumentation installation, as outlined in Option 1. The MBR processes are mostly built off-line, except for work in the equalization tank, which would require temporary bypass pumping and careful management by the contractor. This option would also include the replacement of significant parts of the control system of the plant. Coordination would be required with the Town's system integrator (monitoring and trending of vendor control cabinets).

Overall, this option is likely similar in construction complexity to Option 2, but would involve more substantial commissioning effort because the process, though highly automated, is less familiar to the operators.

CHAPTER 4 COST ESTIMATES

4.1 Conceptual Capital Cost Estimates

The Class D estimated capital costs for each of the options is provided in the table below. These estimates have been updated based on supplier quotations for the major equipment.

The estimated costs include contingencies for Design Development (20%) and Construction (10%), as well as an allowance for engineering fees (10%). A Design Development Contingency is to allow for growth of quantities, increase material costs as the work is better defined in the future. A Construction Contingency is intended to allow for the cost of additional work that is over and above the original construction contract price. This estimate excludes taxes.

Table 4.1: Conceptual Capital Cost Estimates

Category	Option 1 Capital Maintenance	Option 2 MBBR Upgrade	Option 3 MBR	Option A Outfall Extension
Site Works	$69,000	$177,000	$377,000	$1,125,000
Concrete	$0	$0	$526,000	$0
Buildings	$30,000	$40,000	$576,000	$0
Process Equipment	$811,000	$2,285,000	$2,025,000	$0
Mechanical	$890,000	$1,630,000	$2,056,000	$0
Electrical	$599,000	$854,000	$1,134,000	$0
Contractor Overhead	$192,000	$250,000	$335,000	$169,000
Subtotal	**$2,591,000**	**$5,236,000**	**$7,029,000**	**$1,294,000**
Design Development Contingency	$518,000	$1,047,000	$1,406,000	$259,000
Construction Contingency	$259,000	$524,000	$703,000	$129,000
Engineering	$259,000	$524,000	$703,000	$129,000
Total Capital Costs	**$3,627,000**	**$7,331,000**	**$9,841,000**	**$1,811,000**

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgement. It has been prepared in accordance with acceptable principles and practices. Market trends, non-competitive bidding situations, unforeseen labour and material adjustments and the like are

beyond the control of CBCL. As such we cannot warrant or guarantee that actual costs will not vary from the opinion provided.

4.2 Operational Costs

Operational cost estimates for each option are shown in the table below. These are not exhaustive, but include estimated costs for power, labour, replacement of consumable items including UV bulbs and membranes, sludge disposal, and chemicals.

Table 4.2: Operation Cost Estimates

Category	Option 1 Capital Maintenance	Option 2 MBBR Upgrade	Option 3 MBR
Power	$199,000	$199,000	$241,000
Labour	$137,000	$137,000	$205,000
Sludge Disposal	$61,000	$61,000	$84,000
Supplies/ Equipment/ Parts	$28,000	$28,000	$49,000
Chemicals	$29,000	$18,000	$3,000
Annual Operations Cost	**$454,000**	**$443,000**	**$582,000**
Increase in Operations Costs	**$16,000**	**$5,000**	**$144,000**

Option 1 has operations costs slightly higher than existing. There might be power savings from the new aerators, but there would be an increase in UV power costs. There would likely be some increase in pumping costs from implementing a long (~900 m) outfall extension.

Option 2 has the lowest operation costs, which are estimated to be very similar to current operations costs. Labour, power, periodic maintenance, and sludge disposal would be similar to existing costs, while polymer costs would likely go down. There might be power savings from the new aerators, but there would be an increase in UV power costs. There would likely be some increase in pumping costs if an outfall extension were necessary.

Option 3 would have operations and maintenance costs significantly higher than existing, due to increased power, labour, periodic maintenance, and sludge disposal (more sludge that doesn't dewater as well).

4.3 Life-Cycle Costs

Discounted present value calculations were carried out to estimate the Net Present Value of the treatment plant options. This is the standard method for calculating the relative costs of different options. Net Present Value (NPV) is calculated using Equation 4.1, where "Cost in period n" is the net cost in a given year, "n" is the year from 1 to 25, and "rate" is the real discount rate. This cost is calculated for each year in question and the yearly costs are summed.

Equation 4.1 Net Present Value

$$\text{NPV}=\sum \frac{Cost \text{ in period n}}{(1+rate)^n}$$

The effect of this calculation is that costs which occur soon are weighted more heavily than costs which occur farther down the road, based on the idea that a dollar today is worth more than a (more uncertain) dollar next year. The calculations in the report were carried out without applying an assumed inflation rate. This is called a real NPV. If inflation is used (called nominal NPV), it is applied to both the costs (which are higher by inflation) and the discount rate (nominal discount rate equals real discount rate plus inflation, therefore higher) so that the higher costs are discounted faster, and the two effects cancel each other out, giving the same result whether the real or nominal NPV is calculated. The real discount rate used in these calculations is 8%, and the time period over which it is calculated is 25 years, starting in 2018. The net present value is carried out on the capital costs before taxes. These calculations do not account for the revenue from users.

The options for which the life-cycle costs are shown in the table below include the three options described above, including Option 1, Capital Maintenance; Option 2, MBBR Upgrade; and Option 3, MBR. They also include two of these options combined with an outfall: Option 1A, Capital Maintenance and Outfall; and Option 2A, MBBR and Outfall.

Table 4.3: Life-cycle Cost Estimates

Category	Option 1 Capital Maintenance	Option 2 MBBR Upgrade	Option 3 MBR	Option 1A Capital Maintenance & Outfall	Option 2A MBBR & Outfall
Annual Operations Cost	$454,000	$443,000	$582,000	$456,000	$445,000
Operations Cost Present Value	$4,846,000	$4,729,000	$6,213,000	$4,868,000	$4,750,000
Capital Cost	$3,627,000	$7,331,000	$9,841,000	$5,438,000	$9,142,000
Net Present Value	**$8,473,000**	**$12,060,000**	**$16,054,000**	**$10,306,000**	**$13,892,000**

It is necessary to add an allowance to account for construction cost escalation if the plant is constructed several years in the future. This does not affect the relative net present value ranking, but increases costs for all options in order to inform funding applications. We recommend that capital costs be inflated by approximately 3% per year from the 2019 values given to the intended year of construction.

CHAPTER 5 SCORING OF OPTIONS

5.1 Evaluation Matrix

The three options were scored from 1 to 5, where 5 is excellent, and 1 is very poor. These scores are shown in Table 5.1. Option 2 has the highest score, followed by Options 1A, 2A and 3, which have equal absolute scores. Option 1 was not scored because it does not appear to meet the Town's objectives on its own.

Table 5.1: Scoring of Options

Factor	Option 2	Option 3	Option 1A	Option 2A
Operations Cost	5	2	4	5
Capital Cost	3	1	4	1
Process Performance	3	5	1	3
Ease of Operations	5	4	2	5
Ease of Implementation	1	3	4	1
Total	17	15	15	15

These factors were then weighted by holding discussions with Town staff to determine the relative importance of each factor. The weights and the weighted scores (where each factor score is multiplied by the weighting for that factor) are shown in Table 5.2. Option 2 once again has the highest weighted score, followed by Options 3 finally Option 1, which are similar.

Table 5.2: Weighted Scoring of Options

Factor	Weight	Option 2	Option 3	Option 1A	Option 2A
Operations Cost	20%	1.00	0.40	0.80	1.00
Capital Cost	20%	0.60	0.20	0.80	0.20
Process Performance	25%	0.75	1.25	0.25	0.75
Ease of Operations	20%	1.00	0.80	0.40	1.00
Ease of Implementation	15%	0.15	0.45	0.60	0.15
Total	**100%**	3.50	3.10	2.85	3.10

Based on the scoring, Option 2 appears attractive to be carried forward to the predesign stage; however, this option retains the risk of requiring an outfall extension, at which point the additional capital cost incurred would push the weighted score of Option 2A down to 3.10, which is equal to Option 3. The net present value of Option 2A is still lower than Option 3 because of the higher operating costs required with Option 3.

APPENDIX A

Sketches of Proposed Options

NORTH

REPLACE HEADERS, AERATORS, AND AIR PIPEWORK WITH NEW IN PROCESS TANKS 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B AND THE EQUALIZATION TANK. ALL METAL COMPONENTS TO BE 316L STAINLESS STEEL OR BETTER

REPLACE PLASTIC MEDIA WITH NEW FIXED-IN-PLACE MEDIA IN ALL BIOLOGICAL PROCESS TANKS

INSTALL 500kW PAD MOUNTED EMERGENCY GENSET

MODIFY INSTRUMENTATION TO PICK UP AIRFLOWS ON SCADA SYSTEM

REPLACE POLYMER MAKEDOWN SYSTEM IF REQUIRED AFTER OPTIMIZATION

REPLACE RECIRCULATION PUMPS

OPTIMIZE DAF OPERATION (MANUFACTURER'S TECH)

REPLACE RECIRCULATION PUMPS

MONITOR SALINITY ON SCADA SYSTEM

MODIFY GRIT PIPEWORK TO REDUCE BLOCKAGES

REPLACE SCREEN WITH 6mm PERFORATED FINE SCREEN, REPLACE SCREENINGS HANDLING SYSTEM

EXTEND ELECTRICAL ROOM AND INSTALL TRANSFER SWITCH AND MAIN BREAKER SWITCH BOARD

ADD SECOND BANK OF UV DISINFECTION LAMPS AND POWER DISTRIBUTION CENTRE

MONITOR SUSPENDED SOLIDS ON SCADA SYSTEM

1"=10'-0" 2 0 2 5 10 15 20ft.

PRELIMINARY
NOT FOR CONSTRUCTION

No.	Description	Date	By
B	ISSUED FOR REPORT	MAR 26/19	DAT
A	ISSUED FOR REVIEW	JAN 11/19	DAT

Revision or Issue

TOWN OF LUNENBURG

LUNENBURG WASTEWATER TREATMENT PLANT

PROCESS

PRELIMINARY LAYOUT OPTION 1

CAPITAL MAINTENANCE

CBCL LIMITED
Consulting Engineers

CBCL No	Contract No	Date	Scale
180823.01	–	JAN 2019	1"=10'-0"

Designed	Drawn
SHE	BMF
Checked	Approved
DAT	DAT

Sheet No 1 of 3

Drawing No **SKP01**

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NORTH

REPLACE HEADERS, AERATORS, AND AIR PIPEWORK WITH NEW IN PROCESS TANKS 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B AND THE EQUALIZATION TANK. ALL METAL COMPONENTS TO BE 316L STAINLESS STEEL OR BETTER

INSTALL HIGH SALINITY BYPASS

REPLACE PLASTIC MEDIA WITH SMALLER DIAMETER HIGHER CAPACITY MEDIA

REPLACE ALL SIEVES TO SUIT SMALLER MEDIA

INSTALL 500kW PAD MOUNTED EMERGENCY GENSET

MODIFY INSTRUMENTATION TO PICK UP AIRFLOWS ON SCADA SYSTEM

REPLACE DAFS WITH NEW DAFS, PUMPS AND CONTROLS

MONITOR SALINITY ON SCADA SYSTEM

MODIFY GRIT PIPEWORK TO REDUCE BLOCKAGES

REPLACE SCREEN WITH 6mm PERFORATED FINE SCREEN, REPLACE SCREENINGS HANDLING SYSTEM

EXTEND ELECTRICAL ROOM AND INSTALL TRANSFER SWITCH AND MAIN BREAKER SWITCH BOARD

ADD SECOND BANK OF UV DISINFECTION LAMPS AND POWER DISTRIBUTION CENTRE

MONITOR SUSPENDED SOLIDS ON SCADA SYSTEM

1"=10'-0" 2 0 2 5 10 15 20ft.

PRELIMINARY
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Revision or Issue

TOWN OF LUNENBURG

LUNENBURG WASTEWATER TREATMENT PLANT

PROCESS

PRELIMINARY LAYOUT OPTION 2

UPGRADE MBBR AND DAFS

CBCL LIMITED
Consulting Engineers

CBCL No	Contract No	Date	Scale
180823.01	–	JAN 2019	1"=10'-0"

Designed	Drawn
SHE	BMF
Checked	Approved
DAT	DAT

Sheet No 2 of 3

Drawing No SKP02

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NORTH

CONSTRUCT 2-TRAIN CONCRETE TANK MBR WITH 3 CASSETTES PER TRAIN, INCLUDING MBR PUMPS AND BLOWERS IN A 40ftx40ft BUILDING

BACKPULSE TANK

MBR TANKS

EFFLUENT PIPE

CORE THROUGH FROM EQUALIZATION TANK TO MBR FEED CHANNEL

INSTALL CONCRETE PARTITION IN EQUALIZATION TANK

CONNECT SECOND SIDE OF EQUALIZATION TANK DIRECTLY TO OVERFLOW BOX

BLOWERS ON UPPER LEVEL, PROCESS PUMPS ON LOWER LEVEL

OH/DOOR

DRUM SCREENING (2mm FINE SCREEN)

RETURN ACTIVATED SLUDGE PIPE

REMOVE PLASTIC MEDIA FROM ALL BIOLOGICAL PROCESS TANKS

DIVERT DEGRITTED INFLUENT TO DRUM SCREENING

REPLACE HEADERS, AERATORS, AND AIR PIPEWORK WITH NEW IN PROCESS TANKS 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B AND THE EQUALIZATION TANK. ALL METAL COMPONENTS TO BE 316L STAINLESS STEEL OR BETTER

INSTALL 500KW PAD MOUNTED EMERGENCY GENSET

MODIFY INSTRUMENTATION TO PICK UP AIRFLOWS ON SCADA SYSTEM

REMOVE EXISTING DAFS, PUMPS AND SLUDGE PUMPS

MONITOR SALINITY ON SCADA SYSTEM

MODIFY GRIT PIPEWORK TO REDUCE BLOCKAGES

REPLACE SCREEN WITH 6mm PERFORATED FINE SCREEN, REPLACE SCREENINGS HANDLING SYSTEM

EXTEND ELECTRICAL ROOM AND INSTALL TRANSFER SWITCH AND MAIN BREAKER SWITCH BOARD

REMOVE POLYMER TANKS AND DOSING EQUIPMENT

ADD SECOND BANK OF UV DISINFECTION LAMPS AND POWER DISTRIBUTION CENTRE

MONITOR SUSPENDED SOLIDS ON SCADA SYSTEM

1"=10'-0" 2 0 2 5 10 15 20ft.

PRELIMINARY
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TOWN OF LUNENBURG

LUNENBURG WASTEWATER TREATMENT PLANT

PROCESS

PRELIMINARY LAYOUT OPTION 3

MEMBRANE BIOREACTOR

CBCL LIMITED
Consulting Engineers

CBCL No	Contract No	Date	Scale
180823.01	–	JAN 2019	1"=10'-0"

Designed	Drawn
SHE	BMF
Checked	Approved
DAT	DAT

Sheet No 3 of 3

Drawing No SKP03

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Schedule "A"

Wastewater Treatment Plant Options Assessment – Peer Review

Town of Lunenburg

17 December 2019

DILLON CONSULTING

Introduction

- Presenters:
  - Dave McKenna, M.Eng., P.Eng. – Technical Service Lead, Water/Wastewater Engineering
  - Kyle MacIntyre, P.Eng. – Process Engineer, Water/Wastewater Engineering
- Goal:
  - Provide a peer technical review of CBCL's Wastewater Treatment Plant (WWTP) March 2019 Evaluation Report
  - Comment on their assumptions, findings, cost estimates and recommendations

Background

- Plant built in 2003
- Historical effluent quality issues
- Public concern over discharges to the harbour
- Odour complaints (largely addressed)
- Corrosion in plant
- CBCL Limited completed a report in 2019, Dillon was hired to complete a peer technical review

1 Headworks

First point where waste water enters the plant and solids are separated from the waste water.

2 Aeration Building

Air is added to the waste water to stimulate biological growth.

3 Blower Room

Air needed for the different stages of the treatment process is generated in this room.

4 Chemical Room

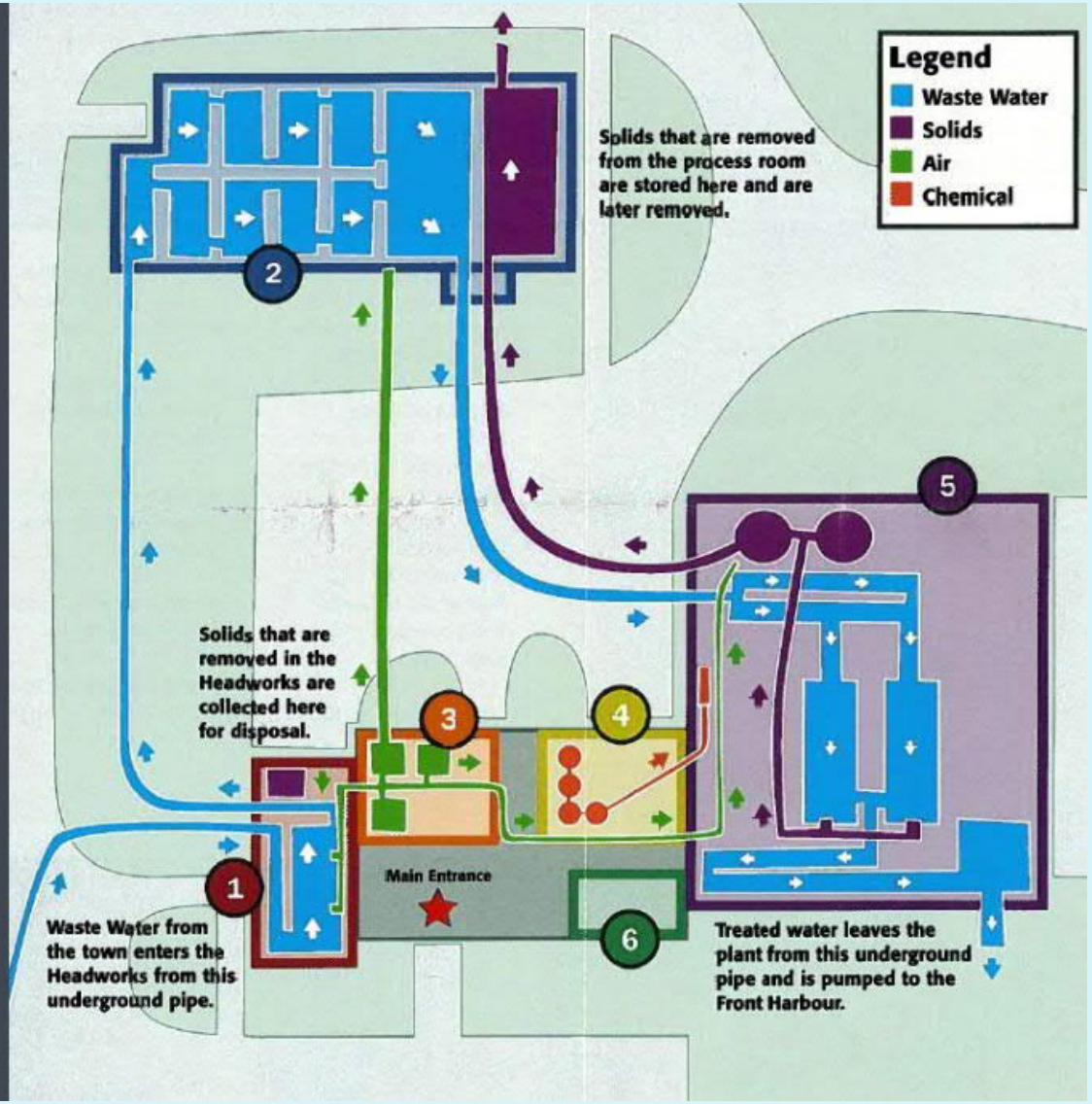
Chemicals are mixed here and added to the process when necessary.

5 Process Room

The final stages where the remaining solids are removed and the waste water is disinfected before exiting the plant.

6 Laboratory

Water is tested at various stages during the treatment process and before it is released to the environment.



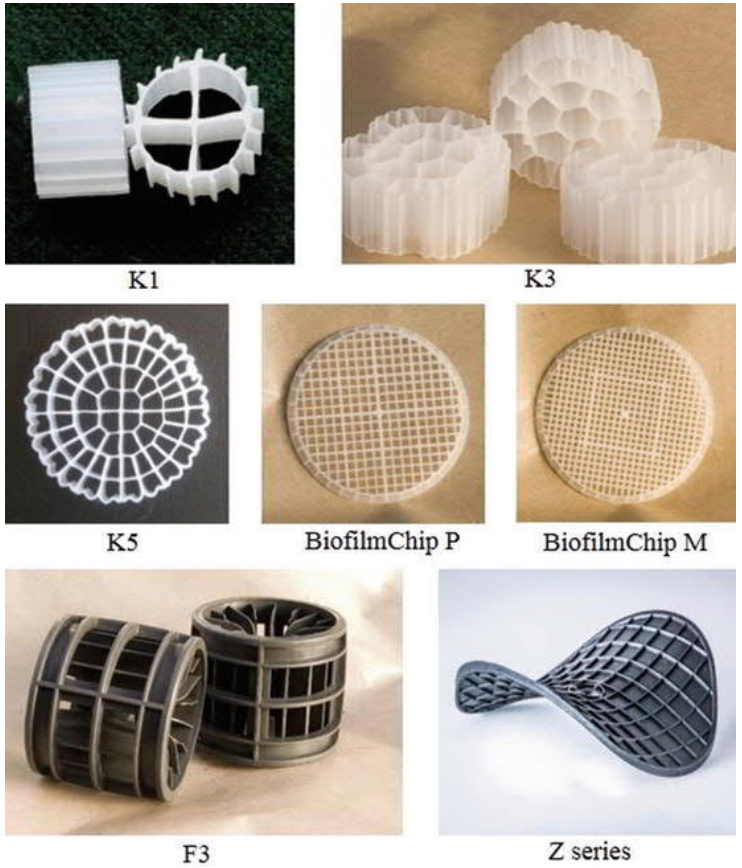
Main Treatment Processes

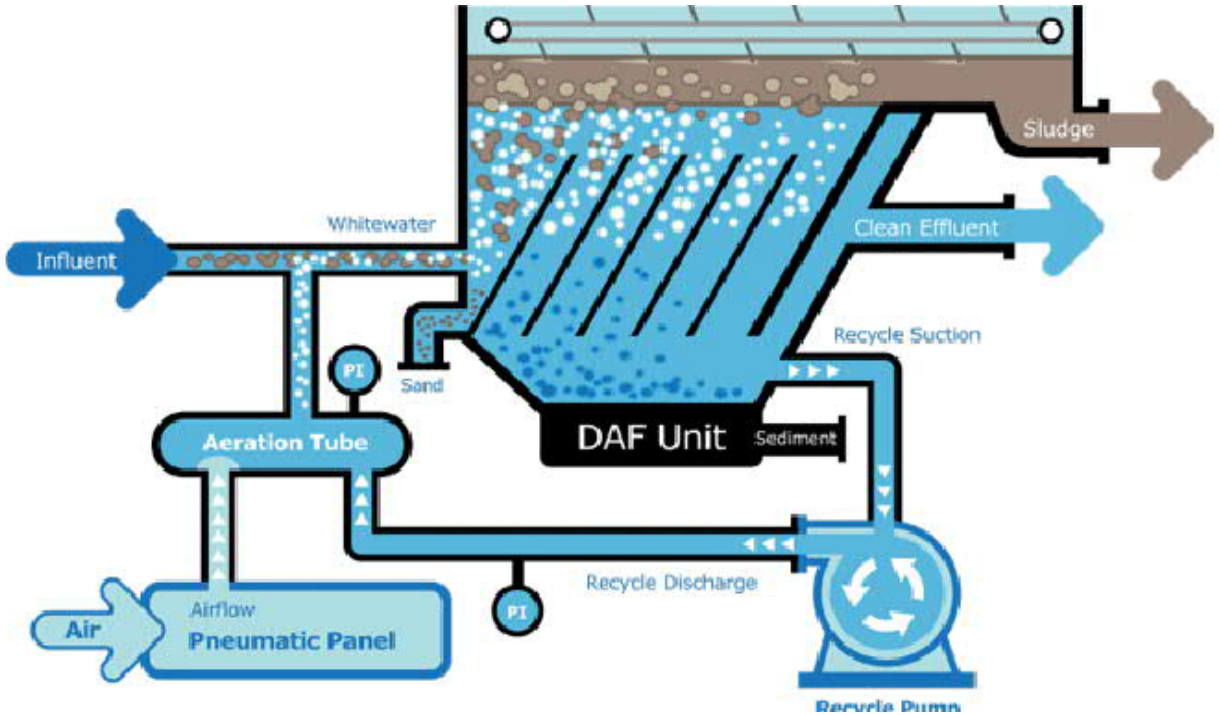
- "Moving Bed Biofilm Reactor" (MBBR)
  - Very low footprint
  - Floating "discs" provide a surface for attached bacteria (biofilm)
  - Air from the blowers keep the media "floating" in the tanks and satisfy biological demand
  - Typically provides a high degree of treatment, including nitrification

- "Dissolved Air Flotation" (DAF)
  - Process to remove particles from the treated wastewater
  - Particles mix with chemicals to form flocs before the DAF
  - Micro bubbles are created in the DAF that stick to the flocs and float them to the surface where they are skimmed. Heavier/larger particles sink to the bottom and are collected
  - Typical operation vs. Town's operation

DILLON CONSULTING

Town MBBR Media (Left) vs. Newer Media (Right)



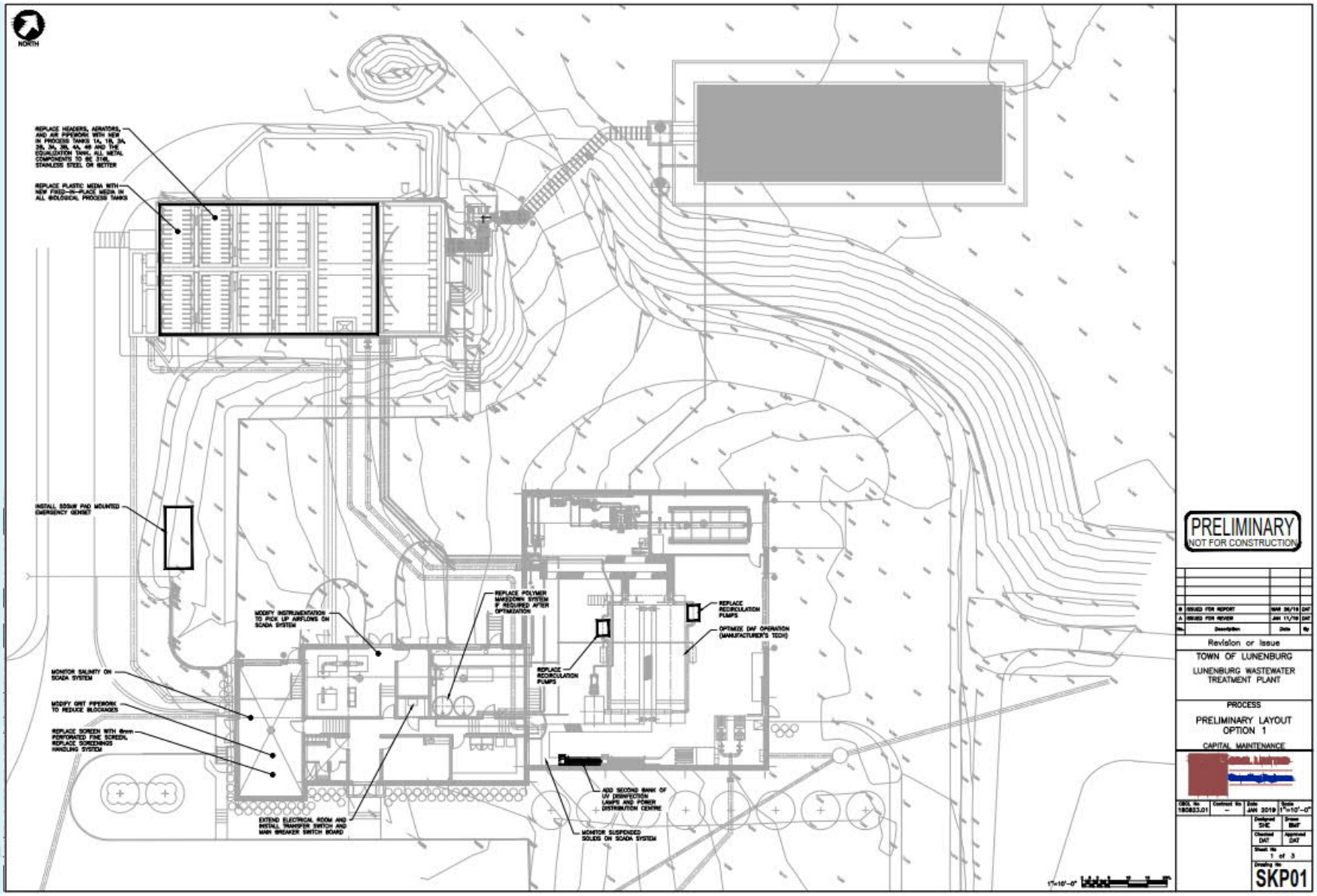


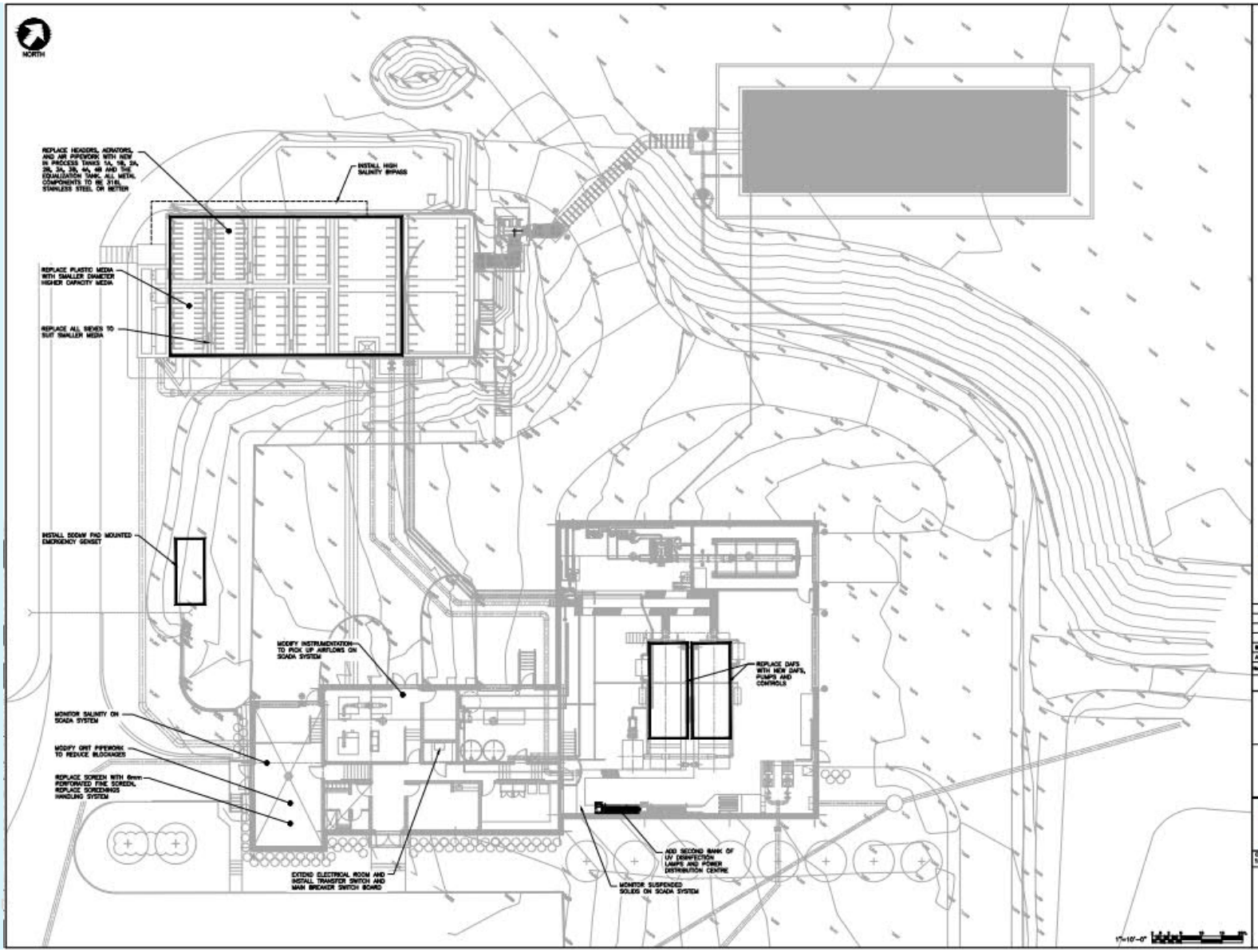
Typical DAF Process

Options Considered

CBCL Option 1:	CBCL Option 2:	CBCL Option 3:	Dillon Option 4:
Replace MBBR Media with Fixed-in-Place Media Optimize DAF Operation New screen, aeration $3.63M Capital	New MBBR media Replace DAF Units New screen, aeration $7.33M Capital	Replace MBBR & DAF with MBR Process ("Cadillac") New screen, aeration, drum screen $9.84M Capital	"Top up" existing MBBR, New aeration DAF Assessment/optimiz'n Outfall Extension Screen maintenance Estimated $5M Capital

Note: Option 1 – 3 Cost Estimates are typically in the +/- 30% range





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A	ISSUED FOR REVIEW	JAN 11/19	DAT

Revision or Issue

TOWN OF LUNENBURG

LUNENBURG WASTEWATER TREATMENT PLANT

PROCESS

PRELIMINARY LAYOUT OPTION 2

UPGRADE MBBR AND DAFS

DBCL No. 18D823.01	Contract No. –	Date JAN 2019	Scale 1"=10'-0"
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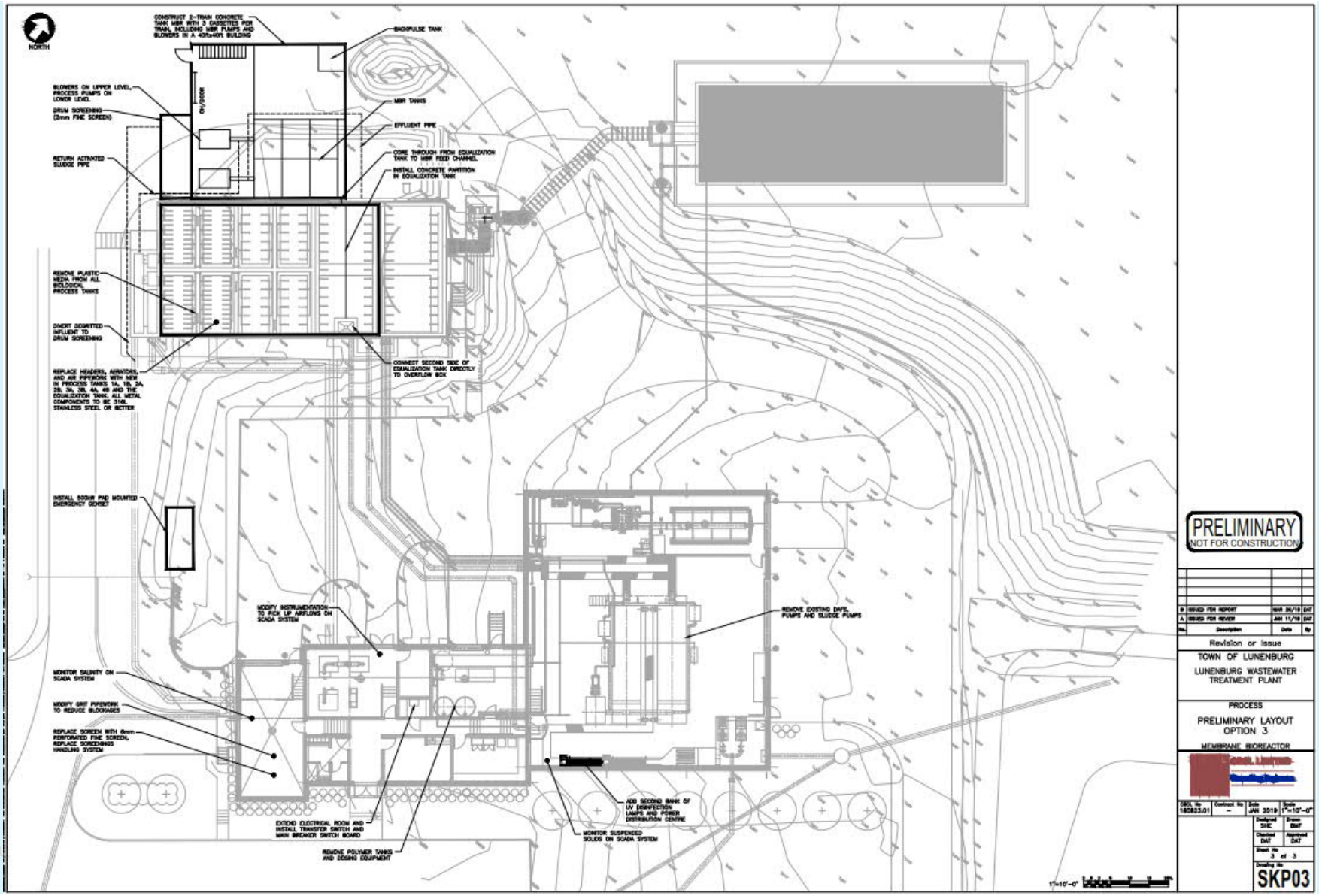

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TOWN OF LUNENBURG

LUNENBURG WASTEWATER TREATMENT PLANT

PROCESS

PRELIMINARY LAYOUT OPTION 3

MEMBRANE BIOREACTOR

CBCL No. 182803.01	Contract No. –	Date JAN 2019	Scale 1"=10'-0"
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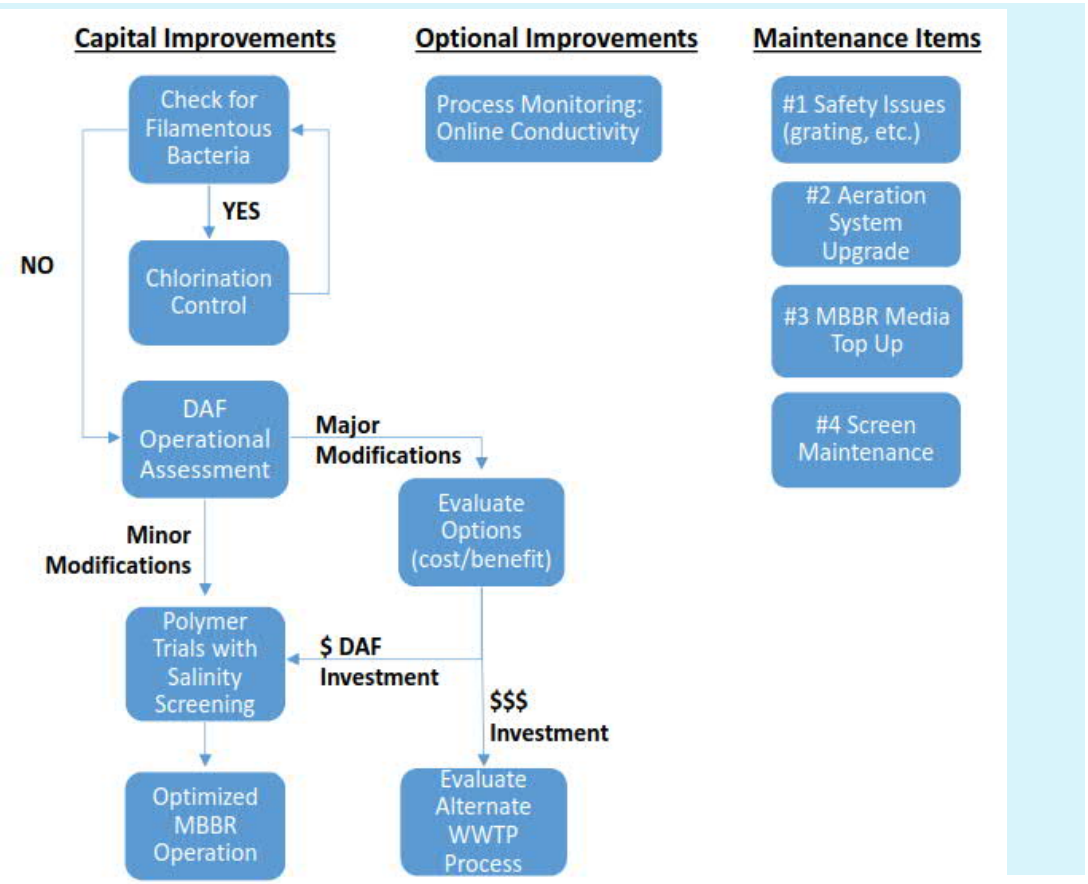
Checked DAT	Approved DAT		
Sheet No. 3 of 3			
Drawing No. SKP03			

Discussion & Recommendations



- Cost vs Benefit
- Availability of funding
- Worker safety #1 priority in upgrades
- Outfall extension a priority regardless of the path forward
- DAF assessment and improvements are critical for existing MBBR
- If DAF issues are resolved:
  - Operational & maintenance upgrades (aeration system corrosion, screen repairs)
  - New CAPEX is reduced to outfall extension

Thank You

Questions?

December 11, 2019

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Town of Lunenburg
177 Cumberland Street
Lunenburg, Nova Scotia
B0J 2C0

ATTENTION: Bea Renton
Chief Administrative Officer

Lunenburg Wastewater Treatment Plant Report – Peer Review

Dillon Consulting Limited (Dillon) is pleased to submit this report summarizing the findings of our peer technical review of the Town of Lunenburg Wastewater Treatment Plant – Evaluation and Options Identification, Final Report, March 27, 2019 prepared by CBCL Limited.

Background & Introduction

The Town operates a WWTP that was built in 2003 and utilizes the moving bed biofilm reactor (MMBR) and dissolved air flotation (DAF) process. The plant has been experiencing issues with meeting Provincial regulatory effluent requirements, generally as follows:

- 2017 BOD: average of quarterly samples met the federal criterion (25 mg/L), but failed the provincial criterion because one sample exceeded the Federal limit by a factor greater than 2.0;
- 2017 Fecal Coliforms: only 74% of samples met the 1000 MPN/100 mL criterion, versus a provincial minimum of 80%;
- 2017 Fecal Coliforms: Multiple samples exceeded the provincial limit of 2000 MPN/100 mL;
- 2018 BOD: One sample exceeded the federal limit by a factor greater than 2.0, which failed the provincial criterion;
- 2018 TSS: One sample exceeded the federal limit by a factor greater than 2.0, which failed the provincial criterion;
- 2018 Fecal Coliforms: Multiple samples exceeded the provincial limit of 2000 MPN/100 mL;
- 2019 Results (January – August Data): With the exception of some of the BOD and TSS results in January 2019, the plant was generally in compliance until June where there was one exceedance of fecal coliforms, which Town staff believed was due

to an illegal substance entering the sewer system. Over half of the July and August sampling showed exceedances above provincial/federal guidelines, however a "milky-greyish" substance was observed throughout the plant and is suspected of causing process upsets. Town staff believed they have identified the source of the unknown sewer discharge, and it has not occurred since.

Sampling of the plant effluent for reporting purposes is performed by weekly grab samples analyzed at the plant's lab and independently verified by accredited external laboratories. In addition to the above permit compliance exceedances, the Town is also challenged with respect to periodic visible wastewater characteristics at the effluent discharge point in the Town harbor, which is easily observed from the commercial wharf by residents and tourists. The cause of the visible plume is discussed by CBCL as resulting from excess polymer and TSS carryover from the DAF unit. This visible plume causes public outcry and poses a reputational risk to the Town.

CBCL Limited was retained in 2018 to complete an assessment report and identified three potential options for the Town to consider to improve their WWTP performance:

1. Replace the existing MBBR media with fixed-in-place media;
2. Upgrade the existing MBBR process and replace the DAF units; and
3. Replace the MBBR and DAF process with a new membrane bioreactor (MBR) process.

Dillon was retained to provide commentary on CBCL's assessment of the existing treatment system, review assumptions, general assessment, cost estimates and recommendations.

Peer Review Methodology

Process engineers from Dillon met with Town staff in October 2019. Following a meeting with the Town's Interim Engineer, CAO and Director of Public works, Dillon met with one of the plant operators and was given a detailed walkthrough of the plant's main processes, and discussed the operational challenges that the plant has been experiencing. These generally focused on:

- Inert solids (i.e. rocks) depositing in front of the influent screen with some passing the screen and plugging downstream processes;
- Severe corrosion of the aeration system piping inside the MBBR building;
- Work MBBR media;

- Solids carry over through the DAF to the treated effluent;
- Low treated effluent ultraviolet light transmittance (UVT) below the UV disinfection system design value, resulting in inefficient disinfection
- Odours throughout plant process areas (largely improved through the addition of a biofilter in 2019);
- Residual polymer levels in the plant effluent discharged to the harbour; and
- Aeration issues and low dissolved oxygen levels in the MBBR tanks.

At the time of the Dillon facility visit, the plant was restarting full operations after completing repairs associated with flooding damage caused by Hurricane Dorian in September 2019.

The following sections provide Dillon's peer review comments on the CBCL report. For organizational purposes, the chapter headings in this report reference the corresponding chapter numbers in the CBCL report.

Report Discussion & Peer Technical Review

Chapter 1: Introduction

No Dillon comments.

Chapter 2: Wastewater Treatment Plant

2.4.2: Bioreactor Tanks

The report comments that wear of the MBBR media in the bioreactor indicates that the media may not be suitable for this application. However, the bioreactor appears to be meeting the BOD reduction targets after 15 years of operation, and MBBR treatment performance is typically associated with a minimum media surface area in the treatment tank. In Dillon's opinion, media attrition over a 15 year period is acceptable based on life cycle cost, and annual replacement of a portion of the media as an operation expense to maintain treatment performance is a reasonable investment. Condition of the media and replacement media costs should be explored with the media supplier.

Dillon has assumed that the existing MBBR has adequate remaining media surface area to support biological treatment. Periodic microscopic examination of the MBBR reactor should be performed to determine if suspended filamentous bacteria are present in the MBBR tanks. Regular sludge volume index (SVI) testing of the DAF feed using an Imhoff Cone is a recommended approach to monitor biological solids; increasing SVI may suggest filamentous bacteria are present. If filamentous bacteria

are observed in the system, they may have an adverse effect on downstream DAF performance. Chlorine dosing of the MBBR would be required to control filamentous bacteria.

2.4.4: Dissolved Air Flotation Units

It is stated that the DAF recirculation pumps are causing turbulent conditions in the DAF, and potentially discharging poor quality micro bubbles. However, the DAF is currently operating using an on/off operation, where batches of wastewater are periodically released by gravity from the equalization tank (similar to the analogy of flushing a toilet). While Dillon observed similar turbulent DAF conditions, it cannot be concluded that this is caused by DAF recirculation pumping and/or periodic batch operation. Dillon observed ongoing release of micro bubbles at the channel surface (UV channel) downstream of the DAF unit, suggesting that micro bubbles are being successfully generated by the DAF system, but turbulent conditions in the DAF are affecting their ability to properly separate with attached suspended solids within the DAF tank.

The report comments that foam observed downstream of the DAF is caused by excess polymer and the weir drop inside the effluent box. While this may be a contribution to the foam, carryover of micro bubbles from the DAF to the effluent channel is likely also contributing to the observed foam.

Chapter 3: Wastewater Treatment Options

3.1: Design Criteria

In general, the design average and peak daily flow presented by CBCL are appropriate for the level of study completed. However, as the project proceeds through preliminary and detailed design, the average and peak daily flows should be based on a more rigorous statistical analysis of flow data, and compared to per capita loadings recommended by the Atlantic Canada Guidelines. Based on our analysis of CBCL's graphical data, this may result in a minor reduction in design flow, but is considered conservative for this stage.

The data in Table 3.1 represents a snapshot of the August – September 2018 operational period, and the title should be modified to reflect this limitation. Design flows and loads should be established at the following stages of engineering based on multiple years' worth of data.

The design basis for the original 2003 construction have been referenced by CBCL, but not included in the report. These 2003 design values should be included in Table 3.1 for comparative purposes.

Earlier in the report it is stated that carbonaceous biochemical oxygen demand (cBOD) was measured during the 2018 sampling events; however Table 3.1 reports the organic loading in terms of BOD. cBOD excludes oxygen consumption attributed to nitrification activity, while BOD considers all biochemical oxygen requirements; BOD is a five-day test, where a portion of the ammonia is typically nitrified. Using BOD and Ammonia (NH_3) loading for biological treatment design, versus cBOD and ammonia, is potentially double accounting for a portion of the oxygen consumption associated with nitrification. It is recommended that when biological treatment upgrades are being designed, a consistent approach to organics is used.

In the discussion regarding salinity effects on bacteria, a distinction should be made regarding the type of treatment and negative effects (inactivation) on bacteria due to salinity changes. The inactivation versus salinity change data presented is related to observations from activated sludge (suspended bacteria) systems, including MBR; however, biofilm based treatment systems (MBBR and fixed film processes) may have a much higher tolerance to salinity changes, based on observations made with oxidizing chemicals (disinfectants). This should be investigated, because it may suggest that biofilms have an advantage over activated sludge systems (Option 3) in this instance. This can be validated by observing any step changes in effluent cBOD following peak salinity events, and the durations of subsequent recovery periods. It should be noted that routine WWTP performance does not appear to be impacted at the average 3,000 mg/L salinity level. We agree that the Town should investigate areas of the collection system where significant inflow of seawater may be occurring at high tide events.

We are in agreement that salinity will have an effect on polymer performance; however, it is not quantitatively established what the performance impacts are relative to the salinity peaks observed at the WWTP. As part of the DAF assessment process, polymer trials should be conducted to identify salinity threshold levels for DAF performance, and/or alternative polymers that perform better in higher salinity wastewaters.

Low ultraviolet transmittance (UVT) is discussed briefly and the impact of potential industrial discharges. While the data suggests that the typical effluent UVT is well below the existing UV system design value, there appears to be only a limited number (five) of data points taken over a relatively short time span. The Town should monitor UVT on a regular basis to trend how it fluctuates seasonally. It is our understanding that the Town is planning to install additional UV equipment under a separate project; this seasonal data would be beneficial in identifying times where the second bank could be turned off to reduce operational (power) costs. A UVT analyzer can be considered with the procurement of additional UV equipment.

The driver for expansion of the UV disinfection system may be premature, pending potential performance improvements in the operation of the DAF process. Dillon recommends that UV expansion not occur until a new baseline for DAF operation is established following optimization efforts.

In addition to the potential plant upgrades, conformance to applicable Town wastewater bylaws should be strictly enforced going forward. This could include WWTP influent composite (24 hours) or grab samples. During Dillon's site visit surface residue from an unknown substance that was released to the sewer in the summer of 2019 was still visible in some areas of the plant, along with a high level of oil and grease deposits. This further supports the need for a rigorous bylaw enforcement and public awareness.

3.2: Upgrade Options

Elevated corrosion is apparent through a review of the plant's visual physical condition that may be the result of elevated salinity in the wastewater based on the community's proximity to the ocean and salinity data. The corrosion may also be related to historic sulfide levels in the headworks and MBBR buildings that may now be mitigated with enhanced ventilation rates. As instantaneous salinity is difficult/impractical to measure directly, the plant could consider installing a conductivity meter. Conductivity levels can be correlated to salinity concentrations, and if an analyzer is installed it could trend data on how salinity is related to tidal and storm events, and impacting the treatment process. High grade steel, such as 316L, or fiberglass reinforced plastic (FRP) where appropriate could extend equipment lifespans and reduce the impacts of salinity. Materials selection for the Headworks and MBBR areas should be carefully considered for upgrade projects.

Elevated salinity in wastewater is not feasible to treat at the municipal level, and involves either membrane treatment (e.g. reverse osmosis) or evaporation; both of these technologies generate high salinity waste streams, and are not recommended for small communities such as Lunenburg. Unfortunately, salinity can also inhibit biological activity and aeration efficiency, and therefore biological treatment performance, so unless significant improvements in the collection system are planned in the near term (e.g. 5 years), the design basis for treatment plant modifications should reflect this parameter. Based on anticipated climate change patterns, the risk of seawater inflow to the collection system will not go away without sewer upgrades to identify and repair leaks.

It is not known if the materials selected for the original aeration system in 2003 were based on a value engineering approach, with less costly but less corrosion resistant materials selected. If this was the case, then the aeration system piping materials have now reached the end of their normal life expectancy and require replacement.

This situation would have been the same regardless of the treatment process. Typical material selection for the aeration system piping is stainless steel; it appears that a galvanized steel was used for original construction.

CBCL recommends that the plant upgrades/replacement be completed under one project, rather than piecemealing together or completing in phases. While generally accurate and preferred from an overall engineering/life cycle cost approach, this execution is not always feasible for a small municipal entity to undertake without significant provincial/federal funding, which can be intermittent and hard to predict based on elections and political focuses. Furthermore, it is not recommended in situations where one or more components in a system are not performing to expectations and requires a systematic evaluation to determine the prioritization of upgrades; replacement of multiple system components at the same time can result in unnecessary spending.

Option 1: Capital Maintenance of Existing Process

This option includes replacing the floating MBBR media with a Fixed Activated Sludge (FAS) process, and retaining the existing DAF process. Dillon assumes this technology option is IFAS (Integrated fixed film activated sludge process). Additional components of option 1 include:

- Replace the existing influent screen;
- Instrumentation upgrades (air flows, influent salinity, effluent TSS);
- New DAF recirculation pumps;
- DAF optimization by the manufacturer;
- Replace polymer system;
- Add additional UV capacity; and
- New emergency generator.

Based on the ability of the existing MBBR system to meet regulatory limits even with deteriorated media (except for occasional exceedances of cBOD that may be related to operational upsets and/or poor DAF performance), Dillon does not support changing to a new IFAS process, which includes new media modules, aeration piping, valves and diffusers. The IFAS process is a relatively new process that combines aspects of activated sludge and biofilm (fixed film) treatment. The IFAS process can use either fixed-in-place media, or dispersed media (same as MBBR process). The important aspect of the media is to provide adequate surface area for growth of bacteria biofilm; this is the same principle as the existing MBBR process. The IFAS process has been used to increase treatment capacity at existing conventional activated sludge (CAS) plants, but less commonly used for new-build facilities. IFAS conversions also allow increased nitrification/denitrification performance when existing plants have effluent ammonia or total nitrogen limitations.

The existing MBBR floating media is still achieving performance targets, and supports the same biofilm as a new IFAS process would. Although worn media may be a concern aesthetically, treatment performance should be the primary performance indicator. We feel it is much less costly to replace a portion of the MBBR media annually in order to maintain a target biofilm surface area. Essentially, media attrition becomes an operational cost. If the existing 15 year old media still provides adequate biofilm surface area for treatment purposes in its 'worn' state, we disagree that the MBBR process should be replaced with the IFAS process, which is operationally more complex compared to the MBBR process.

A new IFAS process will have similar operational issues as the existing MBBR process, particularly with respect to the DAF process. If the DAF process is not upgraded as a component of this FAS option, then it is not considered feasible. Therefore, improving DAF performance should be the priority activity related to this option. If DAF operation cannot be improved, then this option should not be considered further.

An alternative to this option is to consider upgrading the existing MBBR media to one that is more commonly used in the wastewater industry currently. At the time when the Lunenburg WWTP was designed, the original Kaldnes MBBR system, including their media, was likely still under patent protection. Variants of the Kaldnes media, which is much smaller and has a higher surface area to volume ratio compared to the media used at Lunenburg, is now widely available in the marketplace. Conversion to the smaller Kaldnes-type media would require replacement of the media retention screens with smaller openings; however, it may be possible to achieve MMBR treatment in only one of the two MBBR trains at Lunenburg due to the increased media surface area. This cost for this option may be offset by reduced operational costs. The Kaldnes media is also more robust than the media currently used in Lunenburg; original MBBR plants are still operational after 30 years using the original media. This topic will be discussed further under 'Option 2'.

Replacement of the existing influent screen at this time should be considered on its own merits, and not included in any of the upgrade options. Capital versus operational costs should be considered relative to screen improvements. We also recommend that the screen manufacturer be brought to site to inspect the unit, and provide recommendations for maintenance repairs or upgrades that may extend life expectancy. The screen has a life expectancy of 20+ years depending on maintenance, so planned replacement around 2023 is not unrealistic based on an asset management planning approach. If government funding is available on a cost-sharing basis, then screen replacement or upgrade may be justified based on remaining life expectancy.

Dillon agrees with the recommended instrumentation upgrades. However, consideration should be made to exclude the air flow measurements, and instead use daily dissolved oxygen readings for process control.

We recommend that the replacement of the DAF recirculation pumps and polymer system be considered as part of the overall DAF performance assessment by the manufacturer.

Installation of additional UV disinfection capacity should be deferred until DAF performance is optimized. If effluent UVT improves, then the need for additional UV capacity may go away.

Addition of a new emergency generator should first be discussed with the Province, to determine if this will be a regulatory requirement. This decision should be based on the reliability of the electrical grid feeding the WWTP, frequency and duration of outages, regulatory drivers, and cost-benefit.

Option 2: Improve the Existing (MBBR/DAF) System

This option includes upgrading the existing MBBR system with new compact Kaldnes-type media, and replacement of the DAF units. Additional components of option 2 include:

- Replace the existing influent screen;
- Instrumentation upgrades (air flows, influent salinity, effluent TSS);
- Add additional UV capacity; and
- New emergency generator.

This option will require a similar upgrade of the deteriorating aeration system piping, valves, and diffusers as compared to Option 1. An additional required modification will be the replacement of media retaining screens in the MBBR tanks with smaller screen openings to retain the new smaller MBBR media. This option also includes an outright replacement of the DAF units, without additional investigation into the costs to improve the performance similar to Option 1.

Dillon does not support replacing the existing MBBR media with the smaller Kaldnes-type media. The existing MBBR system and media appears to be routinely meeting effluent performance with respect to organics removal, and does not justify a wholesale media change. However, as discussed in the last section, there may be a cost-benefit to media change if one of the two existing MBBR treatment trains can be eliminated. This would mean the aeration system in only one train requires replacement, which represents a potential cost savings. This could also provide operating cost savings.

Dillon does not recommend the replacement of the existing DAF units without first determining whether or not it is feasible for modifications to improve their performance. Investigating the performance issues with the DAF process and

potential solutions should be the number one priority to realize maximum benefit of this existing asset.

In Dillon's opinion and experience with the MBBR process, the DAF performance in Lunenburg is questionable and should be further investigated. Successful operation of the DAF unit is critical to overall MBBR system operations. Batch operation and associated high flows to the DAF may be creating disruptive flow patterns that cause turbulence and short-circuiting, which impact DAF separation performance. This issue potentially correlates to the observation of micro bubble, suspended solids and polymer carryover in the DAF effluent. We understand that batch operation and the associated high flow rate was established to maintain a target operating level in the DAF for operational reasons; however, DAF modifications to allow continuous operation under variable flow conditions should be investigated with the manufacturer. It is likely that modifications to the existing units will increase their performance, and overall reliability of the WWTP effluent quality.

On the day of the Dillon site visit, we observed that only one DAF units was operating, with significant turbulence. It is not known if there is a reason for running the DAFs as alternating duty/standby service, but these units should be operating in parallel if possible to reduce the hydraulic loading rate to any one unit. We also noted that there is a 'Continuous – Operation' selector in the plant PLC for the DAF; however, this mode is likely not used based on the above discussion regarding maintaining an optimal high flow in the DAF for operational purposes. Ideal operating conditions for the DAF units include continuous flow, with both units operating in parallel to maximize residence time for separation efficiency.

Inadequate mixing of the polymer prior to entering the DAF could also be contributing to performance issues. An inline mixer, pipe flocculator or mixing tank immediately upstream of the DAF could improve performance at relatively minimal capital cost. Options for integrated upstream polymer mixing can be discussed with the DAF manufacturer.

During our site visit the plant's operator indicated that polymer jar testing for the DAF had recently been completed by a third party. As the polymer dosage is primarily based on flow to the DAF, the impacts of solids loading should also be considered. At a plant this size, jar testing should be completed by operators at a minimum of once per month, ideally weekly. Some industrial plants perform jar tests multiple times a week to optimize polymer dose and reduce operational costs. Dillon recommends that additional polymer trials be conducted, that include salinity as a variable. Seawater can be added to the secondary effluent samples to simulate varying degrees of seawater intrusion that is being observed in the collection system. This testing will allow the operating team to make informed decisions regarding polymer selection and dose versus salinity level. This testing may also identify alternate polymer products that offer improved performance over a broader salinity range. This work is

strongly recommended to improve DAF performance, particularly with the increased risk that climate change will increase the frequency of seawater intrusion events in the collection system.

Replacement of the existing influent screen at this time should be considered on its own merits, and not necessarily included in any of the upgrade options. Capital versus operational costs should be considered relative to screen improvements. We also recommend that the screen manufacturer be brought to site to inspect the unit, and provide recommendations for maintenance repairs or upgrades that may extend life expectancy. The screen has a life expectancy of 20+ years depending on maintenance, so planned replacement around 2023 is not unrealistic based on an asset management planning approach. If government funding is available on a cost-sharing basis, then screen replacement or upgrade may be justified based on remaining life expectancy, which will be discussed in a later section of this report.

As stated above, Dillon agrees with the recommended instrumentation upgrades. However, consideration should be made to exclude the air flow measurements, and instead use daily dissolved oxygen readings for process control.

Installation of additional UV disinfection capacity should be deferred until DAF performance is optimized. If effluent UVT improves, then the need for additional UV capacity may go away. However, if government funding is available on a cost-sharing basis, then this upgrade may be justified from an economic perspective. The presence of residual bubbles from the poorly-functioning DAF may also be contributing to UVT issues; the presence of these bubbles can scatter light, reducing disinfection efficacy.

Similar to option 1, the addition of a new emergency generator should first be discussed with the Province, to determine if this will be a regulatory requirement. This decision should be based on the reliability of the electrical grid feeding the WWTP, frequency and duration of outages, regulatory drivers, and cost-benefit.

Option 3: Replace with MBR Process

This option includes replacing the existing MBBR system with a new membrane bioreactor (MBR) treatment system. This process would reuse the existing MBBR tankage in addition to new tankage to house the MBR equipment. We agree that this option will provide a high quality effluent that will reliably meet all regulatory limits, and reduce the risk of outfall episodes. With the MBR system, the existing DAF system would no longer be required. Additional components of option 3 include:

- Replace the existing influent screen;
- Instrumentation upgrades (air flows, influent salinity, effluent TSS);
- New drum screen for the MBR system;
- Add additional UV capacity; and
- New emergency generator.

MBR is a proven process with high quality effluent results, and is typically used for water re-use applications (e.g. irrigation water). The membranes provide very fine filtration of the effluent, effectively removing most suspended solids. However, MBRs have a high lifecycle cost relative to other options and requires a higher level of operator attention compared to the existing plant process. In addition, the membranes can be susceptible to foulants in the wastewater that can damage the membrane material. The operations staff noted an event in 2019 where an unknown paint-like substance passed through the WWTP, coating surfaces. An event like this could severely upset an MBR system, with potential costly replacement of the membranes required.

In addition, Dillon observed significant oil and grease through the WWTP, which can result in increased operational costs associated with chemical cleaning frequency of the membranes. If this option is selected, the Town will need to evaluate sewer bylaw enforcement and community outreach so risks of illegal dumping and oil and grease trap maintenance are well understood.

The MBR building will require dedicated air handling systems and odour control; it may be possible to connect this to the existing biofiliter, but it is unclear if it has capacity.

Dillon does not recommend proceeding with this option at this time, until effort has been made to optimize the existing MBBR and DAF systems, as discussed in the previous sections. This option represents a high capital and operating cost scenario, which may be difficult for the Town to accommodate.

Replacement of the existing influent screen at this time should be considered on its own merits, and not necessarily included in any of the upgrade options. Capital versus operational costs should be considered relative to screen improvements. We also recommend that the screen manufacturer be brought to site to inspect the unit, and provide recommendations for maintenance repairs or upgrades that may extend life expectancy. The screen has a life expectancy of 20+ years depending on maintenance, so planned replacement around 2023 is not unrealistic based on an asset management planning approach. If government funding is available on a cost-sharing basis, then screen replacement or upgrade may be justified based on remaining life expectancy, which will be discussed in a later section of this report.

Dillon agrees with the recommended instrumentation upgrades. However, consideration should be made to exclude the air flow measurements, and instead use daily dissolved oxygen readings for process control.

Installation of additional UV disinfection capacity should be deferred until DAF performance is optimized. If effluent UVT improves, then the need for additional UV capacity may go away. However, if government funding is available on a cost-sharing basis, then this upgrade may be justified from an economic perspective. Additional

UV disinfection capacity should be deferred until new DAF unit performance is validated, or existing DAF system performance is optimized. If effluent UVT improves, then the need for additional UV capacity may go away. The presence of residual bubbles from the poorly-functioning DAF may also be contributing to UVT issues; the presence of these bubbles can scatter light, reducing disinfection efficacy.

Addition of a new emergency generator should first be discussed with the Province, to determine if this will be a regulatory requirement. This decision should be based on the reliability of the electrical grid feeding the WWTP, frequency and duration of outages, regulatory drivers, and cost-benefit.

Supplemental Option A: Extend Existing Outfall

The existing outfall location under Fisherman's Wharf is a non-ideal location given the plant's history with process upsets, poor apparent mixing, proximity to public use and media coverage. Extending the outfall beyond public view will also improve mixing and reduce the public health risk associated with effluent contact.

Dillon views this option as one of the highest priorities for the Town. All WWTPs have upsets from time-to-time, and having the effluent discharge in clear view of the public with minimal mixing is not ideal. The current situation with polymer carryover is an example where the public can observe visual clues and assume a worst case scenario. The media is typically very quick to report on issues and perceptions, which generates mistrust of the Town's operations, which is not desirable. Even if the Town can successfully optimize the existing MBBR process and reliability to improve effluent quality, we still recommend relocating the outfall to a more suitable location in the harbor.

Chapter 4: Cost Estimates

In making capital decisions, the Town should be fully aware of the level of estimate completed. CBCL refers to their estimate as "Class D", which appears appropriate given the level of engineering described in their report. However, this level of estimate is, by definition, at best accurate to ±30% for complex engineering projects such as retrofits like this, depending on the level of engineering design completed. When evaluating and making decisions at the conceptual stage, the upper range of the estimate accuracy should be used for whichever option is selected to avoid project funding issues during implementation.

Background information/details related to the development of CBCL's cost estimates were not provided, so our commentary focuses around our professional judgement, capital work on previous plants and the cost presented in 4.1, 4.2 and 4.33.

The three contingencies (design development, construction and engineering) presented are appropriate for this stage of engineering. In some cases for more

complex projects the construction contingency may be increased to 15%; likewise for the engineering allowance, especially if in-depth background studies or full-time construction inspection are required.

Installation costs appear to be based as a percentage of equipment costs, which is standard practice for this level of project. The general mechanical & electrical allowances appear suitable for new construction, however retrofits are typically more expensive. The percentage factors for these items should be reviewed and possibly increased by 5-15%.

CAPITAL COST ESTIMATES

Option 1: Capital Maintenance of Existing Process

It is unclear from the report what the $69,000 Site Works cost is for. All of the work, with the exception of the new generator, appear to be inside the existing plant.

As discussed in this report, we do not feel that replacing the MBBR media with a fixed in place media is warranted, and the associated cost should be utilized towards MBBR media top-up instead.

Option 2: Improve the Existing System

It is unclear from the report what the $177,000 Site Works cost is for, since the work will be contained within the existing plant building and tanks. The equipment costs and associated M&E allowances appear suitable for a full MBBR media and DAF replacement. However as discussed previously, a full DAF replacement may not be required.

Option 3: Replace with MBR Process

Due to the high quality effluent produced by an MBR, the additional UV bank may not be required under this option. However, it is understood that the UV upgrade may proceed ahead of any major plant project, and hence why it was considered under this option as well.

MBR equipment costs can vary dramatically based on the supplier, quality and type (flat plate versus hollow fibre). Acknowledging the legacy issues surrounding the topic of wastewater treatment in the Town, we would recommend that if Option 3 is pursued, a high quality product be purchased. Based on our historical work, the equipment costs for such an MBR product this scale may be as much as double the $2M allowance currently budgeted. This will have a trickledown effect and increase the subsequent construction and design related costs. However, if the Town is willing

to procure a system from a smaller manufacturer, and CBCL has based their estimates on vendor quotations, the estimated process equipment costs are reasonable.

Supplemental Option A: Extend Existing Outfall

No drawing was provided by CBCL as part of this option, however ABL Environmental completed a study in 2014 that considered outfall extension options. This section of the CBCL report seems to build on the ABL work, and notes that it is based on 920 m of 400 mm ⌀ HDPE pipe placed along the bottom of the harbor. This equates to approximately $1,200/m for installed outfall piping. CBCL acknowledges that this option was only evaluated at a high level, so it is recommended that this estimate not be considered a "Class D" level of estimate and carry an even higher cost safety factor. For outfall installation, especially in populated waters such as Lunenburg's, it can often be as high as $2,500 – $5,000/m.

As noted in the CBCL report, the outfall cost estimate does not include pumping upgrades that may be required to manage the additional headloss associated with the outfall extension, or what onshore outfall piping modifications may be required.

Regulatory assistance requirements with in-water work are often extensive, and may require an updated Environmental Risk Assessment.

Under the assumption of ABL's Option 3 (longest extension) and our previous experience, Dillon recommends that a minimum of $3,000,000 plus HST should be budgeted for design, permitting and construction of an outfall extension at this stage until detailed engineering and more accurate cost estimates can be completed.

OPERATIONAL COST ESTIMATES

Background information from current operations (e.g. chemicals, labour, parts and equipment, and power) was not presented in the CBCL report, so each option in Table 4.2 was reviewed for general accuracy based on the breakdown provided. The total current annual operational costs is understood to be $438,000. Options 1 and 2 appear adequately costed at this preliminary stage.

The operational cost for Option 3 appears low in our opinion. Additional chemicals to clean and maintain the MBR will be required, and the $3,000 current allowance is too low. We assume that the power consumption was based on a calculation of motor sizes and run times, however we would expect for an MBR plant of this size with new air scour blowers and membrane feed/vacuum pumps that costs will exceed the $241,000 allowance for power (increase of $42K over current operations). It is not clear how the operating costs cover membrane replacement, which is expected approximately once every 7 years.

Dillon recommends an annual allowance be included under each item for routine capital investment. This is typically 1% of the major equipment capital cost. It is not clear if this has been included under the category 'Supplies/Equipment/Parts'.

LIFECYCLE COST ESTIMATES

The approach used by CBCL for lifecycle costs is consistent with industry standards. The dollar values that input into the calculation could be modified as discussed previously, which would impact the LCC per option. This has the possibility of increasing the overall Net Present Value (NPV) of Option 3 above the $16M presented.

The report suggests that the capital costs be inflated 3% per annum for each year the project is delayed beyond 2019. This is representative of typical increases in construction costs year-year, but does not account for the larger price increase in construction projects associated with government funding cycles. Due to the amount of capital projects during these years, contractor resources become limited and tendered bids can increase significantly as a result. If the majority of this project is to be federally funded, the capital estimates should be increased, or a contingency added, to reflect this potential market risks.

An allowance should also be included for major capital overhaul under each option. This depends on the type of equipment, but typically occurs around years 10-15. Typically this value is 20% of the major equipment capital cost. The MBR option (#3) will require complete replacement of membranes, typically every 7 years, depending on how they are maintained. The CBCL report does not specifically identify this cost in Table 4.2. However, over a 25-year life cycle analysis, 3 membrane replacement events should be considered at years 7, 14 and 21.

Chapter 5: Scoring of Options

The method utilized by CBCL is a common way of evaluating non-financial factors. It can be somewhat subjective, and as such is best used to eliminate options to create a shortlist rather than identify the preferred path, unless the rating discrepancy is significant. Dillon normally recommends that clients participate directly in the development of scoring methodology, including topics and their weighting.

Table 5-1 Scoring of Options

When using this method of scoring, it is also typical to have a "Very Poor" (1) and "Excellent" (5) rating for each factor, unless it is qualitative. "Operation's Cost" factor is a quantitative attribute, of which Option 3 should be a 1. Option 3 also received a very high rating for ease of operations, however MBRs can be quite complex to operate and require increased maintenance associated with chemical cleaning.

Option 3 also scored higher than Option 2 on Ease of Implementation, presumably because of the ability to operate the existing process while the new MBR building is built. However, if Option 2 is selected it could also be completed in a similar fashion as each of the main processes have two trains. There would be a risk to effluent quality should this main train experience issues during construction, but if Option 2 is selected it would be a relatively short duration upset.

Process performance is critical to wastewater operations; however, this table does not directly take into account risk to the public. Under an outfall extension scenario, any process performance upsets with visible aesthetic changes will be largely mitigated by distance from the outfall to public receptors, and improved mixing/dilution. There would still be a need to maintain effluent quality with respect to Provincial requirements, but this would be regulatory driven rather than publically perception.

Table 5-2 Weighted Scoring of Options

The weighting related to Operations Cost and Capital Cost should be reviewed against the funding method for the project. Under federal programs where the municipality pays a relatively small (e.g. 30%) portion of the capital cost, it may be in the Town's interest to select an option that has a lower operational cost but carries a higher capital cost. These scenarios could be explored further by incorporating a capital discount value to each option.

General Discussion

The CBCL report provides three potential options for the Town of Lunenburg related to improving operations at the WWTP. These options include a mix of comprehensive upgrades, with associated capital expenditures, that may not be prioritized to meet the Town's economic situation. The approach of comparing three options is commonly applied by engineering consultants to compare technology alternatives; however, it is not always the best approach where an existing process has operational challenges, which could be resolved/improved by more aggressive operational troubleshooting and relatively low cost modifications.

Options 1 and 2 in the CBCL both include variants on improving the existing MBBR system, including replacement of the current MBBR media with either fixed media or new smaller MBBR media, and either optimizing or replacing the existing DAF process. Rather than have only two options to assess, Dillon recommends that the Town implement a decision-making tool that can be used to guide the Town through the process of upgrades to improve plant operations.

Dillon has identified the DAF process as the key priority for improving performance of the existing MBBR plant, and recommends that troubleshooting efforts initially focus on DAF improvements through operational changes and/or modification coordinated with the DAF manufacturer. In this case, a progressive approach to WWTP evaluation and modifications may provide best value for the Town, and maximize reuse of existing assets.

Dillon has prepared an example of a decision-making flow chart in Figure 1 to show how engineering activities can be prioritized in a plan to realize improved treatment performance. We feel that the current MBBR/DAF process, which is approximately 15 years old, still has significant residual asset value for the Town; replacing the MBBR with a new and expensive process (Option 3) should be deferred until improvements to the DAF system are fully explored. If upgrades to the existing DAF units is not feasible, then Option 3 should be compared to DAF replacement with new units capable of operation under continuous flow conditions, which should still be a lower-cost alternative. Since the MBBR process still appears to achieve performance objectives, we do not feel that changing to a different media type (IFAS or smaller MBBR media) should be considered unless there are clear financial drivers. An annual addition of MBBR media to account for media wear and attrition should be considered.

Dillon also recommends that the Town prioritize the extension of the existing outfall from the current location, as previously explored by the Town. The WWTP plant will at risk of occasional performance upsets regardless of the treatment process, and the residents and media now have a heightened awareness of the outfall location.

The Town should also monitor any potential regulatory changes (such as more stringent nutrient limits). MBBR technology can be adjusted through the addition of more air, media and (if necessary) reactor tanks to reduce TKN, and TP through the addition of chemical precipitation. Dillon noted that the amount of media in the existing MBBR reactor appears to be relatively low; additional treatment capacity, including nitrification, could be achieved with increased media content.

If there is concern at the political level that the MBBR process has an associated high risk to the Town in the future, then we suggest that Town representatives visit one or more municipalities where MBBR is used successfully, to evaluate if an upgraded and well-run MBBR process will meet Town expectations.

Additional upgrades have been included in all CBCL Options, which Dillon has separated in Figure 1 under the title: 'Maintenance' and 'Optional'. Maintenance-related activities are considered to be required if the WWTP system was operating as expected and had a long remaining life. This includes safety related upgrades, aeration system piping upgrades, MBBR media top-up, and influent screen maintenance. These maintenance items should be planned as an operational cost.

However, depending on funding opportunities, it may be worthwhile for the Town to perform these upgrades with a capital project.

If the Town wishes to develop costs that reflect Dillon commentary in this report, it would be a modification of Option 1; This Option will be referred to as Option 4. This option would involve the following key components related to plant operation:

- Retaining and topping up the existing MBBR media;
- Replacing the aeration system piping;
- DAF operational assessment, including polymer salinity trials;
- DAF upgrades, or new DAF units;
- UV upgrade if required following DAF upgrades; and
- Outfall extension.

Under Option 4, the influent screen replacement is a decision that the Town must make based on economics, including an assessment of operational costs, existing condition and remaining life expectancy. Similarly, including the emergency generator and enhanced instrumentation should be decided on a cost benefit approach. If funding is available to the Town, procurement of additional spare MBBR media can be considered for future years.

The costs presented are generally appropriate for this conceptual stage of engineering; however, Dillon recommends increasing several of the operational and capital costs. We have also provided estimating qualifications so that the Town fully understands the level of accuracy and upper ranges of the current estimates. Full project endorsement should not be given to a large capital investment until a more refined estimate and associated design is completed, in order to help the Town best execute a project. In our opinion, there is still significant asset value in the existing plant systems and the Town's objectives can be met following a more phased approach to system evaluation and decision making rather than complete plant overhaul as a single project scope.

Dillon Recommendations and Next Steps

The following course of action is recommended for consideration by the Town:

1. Identify WWTP upgrades that are associated with worker safety (e.g. grating, handrails, air quality). Consider a H_2S sensor/alarm in the headworks building;
2. Proceed with next engineering steps and initiate regulatory discussion for outfall extension;
3. Perform microscopic examination of MBBR reactors to determine if filamentous bacteria are present;
4. Replace MBBR aeration system. Consideration should be given to material selection, life expectancy, and life cycle cost. Estimate media volume when tanks are drained;
5. Top up MBBR media;

6. Engage Suez (DAF manufacturer) to explore options to improve DAF performance. This will include costing of modifications as well as the cost of new DAF units;
7. Perform regular polymer trials as part of DAF optimization. Testing should include an evaluation of salinity effects and limitations for different chemical products;
8. Based on DAF study, proceed with DAF modifications, or consider new DAF units;
9. Evaluate adding capacity of UV disinfection following DAF optimization, when a new baseline for plant UVT is established;
10. Assess optional instrumentation upgrades using a cost-benefit approach. Consider the likelihood of whether the operations' team will use the additional data for operational optimization, operational cost savings, or risk reduction;
11. Rigorous testing and enforcement of sewer bylaw, coupled with a public awareness program;
12. Continue to collect influent, effluent and flow data to better support future operations and design effort; and
13. Implement or increase annual capital maintenance budgeting to account for more routine "wear and tear" upkeep.

The Town can add an additional option (Option 4) for cost estimating. Option 4, as discussed in this report, represents the low cost alternative to improving WWTP performance with maximum reuse of existing plant assets. Option 4 includes extension of the outfall, which is not included in the CBCL options; however, Dillon recommends outfall extension for all upgrade options.

Closing

We trust this information meets your requirements. If you have any questions regarding this report, please contact the undersigned at your convenience.

Yours truly,

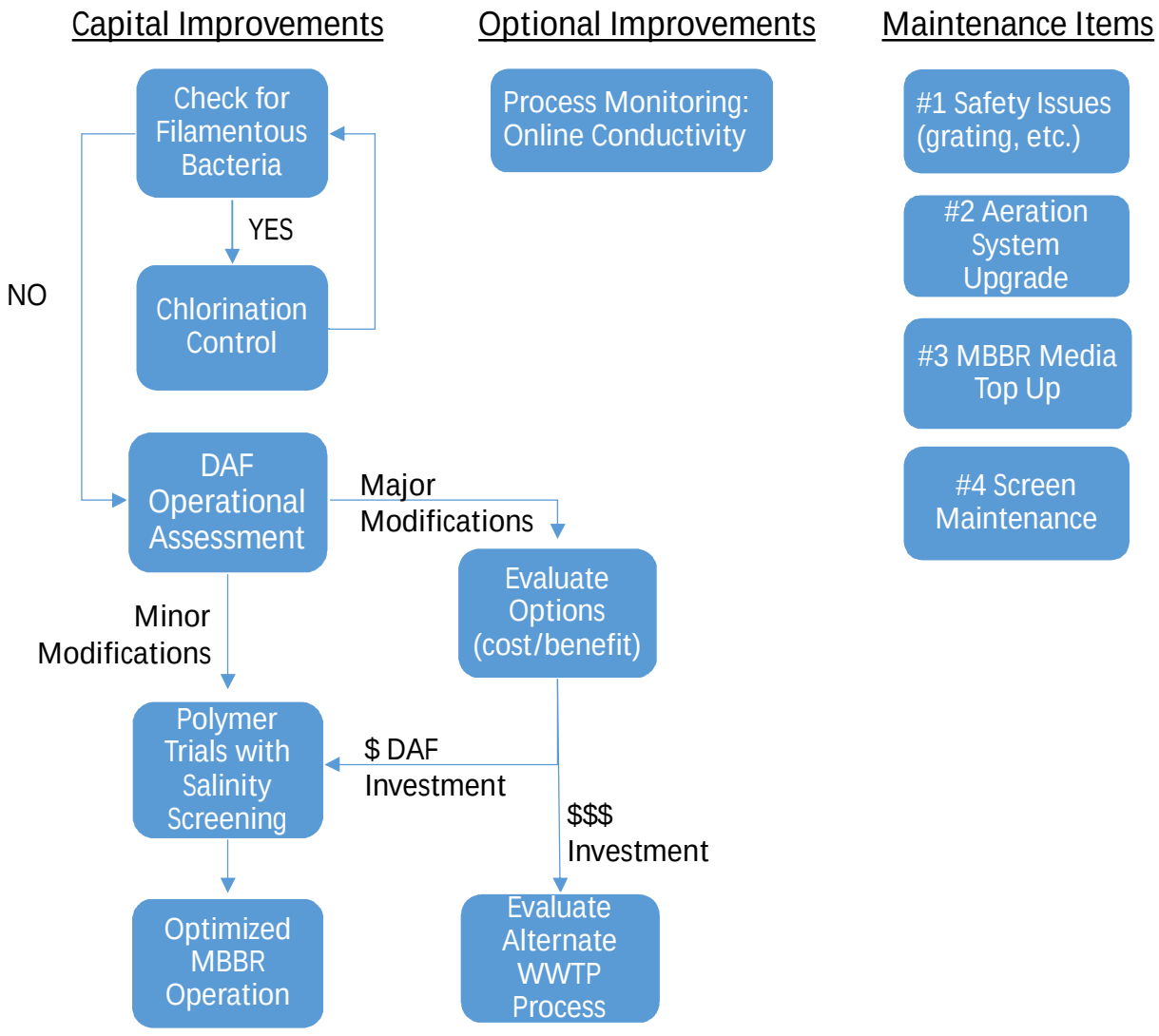
DILLON CONSULTING LIMITED

Dave McKenna, M.Eng., P.Eng.
Wastewater Engineering Technical Lead

Kyle MacIntyre, P.Eng.
Water/Wastewater Engineer

KRM:jes
Our File: 19-1650-1000

Figure 1: Decision Flow Chart



CBCL LIMITED
Consulting Engineers

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Telephone: 902 421 7241
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URL: http://www.cbcl.ca

MEMORANDUM

DATE: 24-FEB-2020

PROJECT NO: 190805.04

MEMO TO	Bea Renton, CAO
SUBJECT	Response to Lunenburg Wastewater Treatment Plant Report - Peer Review
FROM	Mike Abbott, Vice President, Water Treatment
COPIES TO	Ian Tillard, P.Eng.; Sarah Ensslin, P.Eng.

At the request of the Town of Lunenburg, Dillon Consulting Limited submitted a report on December 11, 2019, containing their findings on the Lunenburg Wastewater Treatment Plant Report. We have reviewed the response and offer the following to summarize the current project status.

- We see no fundamental difference to our report recommendations based on the comments provided in the Dillon report. Both reports identify utilizing the MBBR process as the preferred long term process solution. The Dillon report did provide a revised course of action based on a revised objective that included prioritizing options that minimize capital spending in the short term due to a belief that multiple small increments of funding would be easier to secure than those required for larger capital projects. This approach would see an incremental improvement at the plant, project by project, as various sources of funding were applied for, approved, and then implemented.

- The CBCL report did not consider an incremental approach as it was required to compare various options that would address all concerns such that the path forward could be identified. The objective of the report was to provide capital estimates that the Town could utilize to secure project funding under an infrastructure program that is designed for large capital projects. We understand that the Town did not submit an application under the infrastructure program.

- Phased implementation is always a fall back option when funding for the entire project cannot be secured and there are high priority items that must be addressed in the short term. In fact, we are currently implementing bioreactor aeration upgrades which is a good example of the type of project that would result from the incremental approach.

- We understand that the current status of the project is that the Town has applied for and received PCAP funding of $135,000 based on a total preliminary design project budget of $270,000. Therefore, we offer the following as our recommended path forward:

- *Move forward with the preliminary design of CBCL Option 2, Upgrade Existing Process (as recommended in the original CBCL study). Include the following scope items as part of the preliminary design study:*
  - *Identification of sources of sea water into the wastewater collection system and the preliminary design of solutions to reduce seawater inflow;*
  - *Update/Confirm that the existing preliminary design of the outfall is suitable for implementation. Revise details and costs as necessary to prepare for detailed design;*
  - *Include specific process recommendations from suppliers of MBBR/DAF equipment within the preliminary design. Secure budget quotations that include process upgrades that will result in a single supplier accepting responsibility for the performance of the MBBR/Clarification process.*
  - *Identify budgets for implementing the project all at once or incrementally.*
- *Advance the detailed design/implementation of the seawater inflow solutions as soon as projects are identified.*
- *Advance the detailed design/implementation of the outfall extension following confirmation of the preliminary design and budgets.*
- *Apply for funding for the treatment plant upgrade. Make decisions based on implementation after funding amounts are identified.*

Please call me if you wish to discuss the above. We would be pleased to provide additional details and/or budgets to pursue the recommended approach, at your request. We are keenly aware of the Town's efforts in improving plant performance on an accelerated timeline to address regulator concerns. Therefore, in addition to the general comments provided above, we have also included an appendix where some more specific responses to the Dillon comments are provided, organized by unit process. These are provided to help the Town deal with areas where the Dillon plan may appear to diverge from the current approach.

Regards,

Mike

Appendix

Headworks
The Peer Review states that the screen replacement should "be considered on its own merits". The screen performance is currently poor and causes expensive maintenance issues in the grit tank. I believe that replacement could be easily justified at this time, even in the absence of a change in plant process.

Surface Area of Media in Moving Bed Bioreactor (MBBR)
The Peer Review states that "Dillon has assumed that existing MBBR has adequate remaining media surface area to support biological treatment". We agree that the media surface area is adequate in autumn, winter and spring, but we believe that it is not adequate in summer, because it does not consistently meet effluent criteria at this time of year. During the summer, the plant performance often struggles and we believe this is likely due to elevated biological load which the plant does not have sufficient capacity to treat. This apparent shortfall in biological treatment capacity is why it is so important to replace the aeration and add media, in order to increase the actual capacity of the biological treatment process. The illegal discharge experienced in summer 2019 may contribute to this but it is unlikely to be the only factor. The plant was also non-compliant in 2018 for BOD.

Reuse of Existing Media
The Peer Review states that adding to the existing media can be reasonably viewed as an operating expense. From an economic perspective, this is likely true, but from an environmental perspective, it would be preferable not to be continuously sloughing small pieces of plastic into the effluent, and to use media which does not require frequent replacement. The Peer Review questioned whether it would be possible to use just one train of the MBBR if the media was changed to Kaldnes-type media. The Kaldnes media supplier (Veolia) did not recommend this, and it would give no redundancy.

DAF Units
The recirculation pumps were replaced following Dorian, so the bubble quality may have already improved. We agree that there appears to be ongoing bubble release in the UV channel, and that this may indicate that there is not enough residence time in the DAFs. We agree that polymer trials with different salinity would be useful, even in the short term, and that improving DAF performance is a priority activity, again, even in the short term. We recommend tresting continuous operation of the DAFs to see if performance can be improved in this way. We discussed this option with the DAF supplier (Poseidon/Suez) and they said that this would be more typical than batch operation. Suez could make a site visit to check into the performance and settings, and we have a budget quote for this.

The Peer Review recommended doing more frequent jar tests of polymer performance, which we support, but this requires SCADA modifications to allow the actual dose to be adjusted based on the test results. We are currently looking into how to do these modifications.

UV Performance
We agree with the recommendation of purchasing a UVT analyzer. The Peer Review assessment that the UVT may improve with the improvement in biological and DAF performance is possible, but if it does not improve enough, then the additional UV treatment capacity will still be required.

Outfall Extension
The Peer Review recommends outfall extension as the first priority. The outfall is in a very poor position, and in general, it should be moved. However, we would suggest that removal of salt

water from the collection system be considered as a higher priority than the outfall extension st this time.

Safety Improvements

We agree with these recommendations, though the purpose of our report in the RFP was to identify ways to improve effluent quality. Gratings and handrails in a number of places in the plant are in poor condition. Corrosion-resistant replacements should be considered where appropriate. We also agree with more H2S monitoring as a priority upgrade.

Document No:
Meeting: Nov 24, 2020 Council
Circulate: Council, IT, LD, JL, DM
File: Budget 2020/21

M E M O R A N D U M

TO: **TOWN COUNCIL**

FROM: **IAN TILLARD, ENGINEERING CONSULTANT**

DATE: **NOVEMBER 19, 2020**

RE: **WASTE WATER TREATEMENT PLANT OPERATING MANUAL**

---

1. FACTS

The Waste Water Treatment Plant (WWTP) Operating Approval was issued in March 2020. As of the end of August, there were two outstanding conditions:

- 6(a) The Approval Holder shall submit a plan for the management and/or disposal of residuals from the activity to the Department for acceptance on or before August 31, 2020
- 7(d) The Approval Holder(s) shall ensure that an Operations Manual is prepared on or before August 31, 2020

After a review of town records, it became apparent that these documents were never created, although it likely would have been a requirement for any of the previous Operating Approvals.

The ODRC for the WWTP communicated with the regulator at DOE to establish timelines for actions in order to meet these two conditions.

- The first condition was to be met by 30 October, 2020 and that has been completed.
- The second condition is to be met by 29 January 2021 and adherence to this condition is outstanding.

2. ISSUES AND OPTIONS ANALYSIS

In order to meet the second condition an operating manual has to be written. The operating manual consists of operating procedures for the overall plant operations and emergency response procedures. There are specific O&M manuals for all equipment and systems, however the overall plant Operating Manual must be created from scratch. Internal staff do not have the time to undertake this task within the prescribed timeframe.

In order to meet the regulator's deadline the creation of the manual has to be started immediately. It would also be beneficial and more efficient to have someone who is familiar with the plant equipment undertake this task. The most efficient way to

accomplish this and to ensure that the task can be completed by the deadline, is to have the engineer from CBCL, who is providing engineering support to the plant, create the manual. To support this Public Works requested and reviewed a quote from CBCL for this task and CBCL has submitted a price of $12,000 plus tax to provide the following deliverables:

1. Standard operational procedures;
2. Emergency response and notification procedures;
3. Contingency plans;
4. Notification procedures to be used to contact relevant authorities and the public in case of emergency situations, exceedances of approved effluent criteria or bypasses; and
5. Procedures to record and respond to complaints.

The timeline is tight however the Town's relationship with the regulator is generally good so it is anticipated that there would be some flexibility in the deadline for the final submission. Confirmation of a manual in draft form for review would be the minimum deliverable by the deadline, although the objective would be the final submission. Communications will be maintained with the regulator throughout the process.

This award would be a sole source award to CBCL for this work.

3. FINANCIAL IMPACT

This item was not included in the 2020/21 operating budget expenditures for the Waste Water Treatment Plant. The additional funding required to complete this work is $12,000 plus HST. There has been higher than was anticipated sewer revenues in fiscal 2020/21 that are able to be used to offset this additional expense.

4. STRATEGIC PLAN RELEVANCE

The Wastewater Treatment Plant operating manual work outlined in this report addresses a central component of the Town's Comprehensive Community Plan Strategic Direction Goals – 3. Servicing and Facilities.

5. RECOMMENDATION AND DRAFT MOTION

It is recommended that Council approve the following draft motion:

Motion: moved and seconded that Public Works issue a Purchase Order to CBCL for the creation of an Operating Manual for the Wastewater Treatment Plant that meets the condition of the Operating License with funding from the 2020/21 sewer revenues.

Encls.

Acknowledged only by:

Bea Renton
CAO

CBCL
Solutions today | Tomorrow IN mind
Maritime Centre, 1505 Barrington Street, Suite 901
Box 606, Halifax, NS B3J 2R7
902-421-7241 | CBCL.ca | info@CBCL.ca

October 22, 2020

Ian Tillard, P.Eng.
Town Engineer
Town of Lunenburg
PO Box 129
Lunenburg, NS B0J 2C0

Dear Mr. Tillard:

RE: Proposal to prepare Operations Manual as required in WWTP Approval

Background

A revised WWTP Approval was received in September 2020 after the Town's application to confirm that the bacterial limit in the previous Approval was a clerical error, as acknowledged in emails by NSE staff. The new Approval had a number of advantageous changes to other parameters as well. Furthermore, it required the completion of an Operations Manual to contain the following items:

- Standard operational procedures;
- Emergency response and notification procedures;
- Contingency plans;
- Notification procedures to be used to contact relevant authorities and the public in case of emergency situations, exceedances of approved effluent criteria or bypasses; and
- Procedures to record and respond to complaints.

These are all standard items now required for WWTP Operations manuals which were not typically required when the plant was originally built. These are intended to be a reference for the operators, both for current operations and for training.

Scope

Standard operational procedures (SOPs) consist of a list of steps for typical tasks around the WWTP that are carried out frequently. They provide a step-by-step procedure for an operator to follow to do a task consistently. Proposed SOPs for the Lunenburg WWTP are shown in the table below. This is a preliminary list, which may change upon discussion with the Operator, to include the procedures of greatest importance to the operations staff.

Table 1: Proposed SOPs

WWTP Component	Included Standard Operating Procedures
Screen	Start-up, Shutdown, Cleaning
Grit Removal	Start-up, Shutdown, Pump Removal, Cleaning
Blowers	Start-up, Shutdown
Dry Polymer Makedown	Start-up, Shutdown, Routine Operation
Liquid Polymer Dosing	Start-up, Shutdown, Routine Operation
DAFs	Start-up, Shutdown, Routine Operation & Cleaning
UV Disinfection System	Start-up, Shutdown, Routine Operation & Cleaning
Effluent Pumps	Start-up, Shutdown, Routine Operation
Solids Dewatering	Start-up, Shutdown, Routine Operation
Biofilter	Start-up, Shutdown, Routine Operation
Flowmeter	Start-up, Shutdown, Removal, Cleaning & Calibration
Laboratory Procedures	pH, DO, UVT, Salinity Measurement and Calibration
Daily Rounds	Procedures for Daily Rounds

Contingency Plans and Emergency Response and Notification Procedures can be grouped together and are proposed to include the following (Example table of contents is in the Attachments):

- Fire at the WWTP;
- Flooding at the WWTP;
- Power Outage;
- Sewage Spill to the Environment;
- Oil Spill to the Environment;
- Contamination in the Influent;
- Equipment Malfunction;
- Injury to Staff;
- Hauling Wastewater from the WWTP;
- Notification procedures to be used to contact relevant authorities and the public in case of emergency situations, exceedances of approved effluent criteria or bypasses; and
- Procedures to record and respond to complaints.

We propose to complete these documents and provide them to the Town in hard copy (2 copies, one for the plant and one for the Town Engineer's office), pdf and .doc format. They are living documents and it is critical that they can be updated as procedures change in order to reflect what the operators are actually intended to do, both for routine procedures and emergency response procedures.

Schedule

We understand that NSE requires confirmation that these documents have been completed on or before January 29, 2021. We anticipate that we can complete the initial version of the documents before that date (understanding that they should be reviewed annually by the operators and revised as necessary). We propose to provide a copy of the documents by the end of the calendar year for Town review and comments, which will leave enough time for revisions as needed after in the New Year.

Cost

We propose to work under the terms and conditions of the existing Standing Offer. We propose to complete this assignment for a total lump sum of $12,000, including time and expenses. This consists of $10,000 for SOPs and $2,000 for the Contingency Plans and Emergency Response Procedures. Applicable taxes are extra.

Thank you for the opportunity to provide this proposal. Please do not hesitate to contact me with any questions.

Yours very truly,

CBCL Limited

Prepared by:
Sarah Ensslin, M.Sc., P.Eng.
Process Engineer
Direct: 902-492-7979, Ext. 2238
E-Mail: sensslin@cbcl.ca

Reviewed by:
Mike Chaulk, M.A.Sc., P.Eng.
Manager, Process Engineering

CC: Bea Renton (Town of Lunenburg)

Proposal No: 600504.00

TABLE OF CONTENTS

Kelly Jardine

From: Ensslin, Sarah [mailto:sensslin@cbcl.ca]
Sent: October 28, 2020 10:45 AM
To: Ian Tillard <ITillard@explorelunenburg.ca>
Cc: Bea Renton <brenton@explorelunenburg.ca>
Subject: RE: Proposal for Ops Manual to meet new Approval conditions

Hi Ian,

Here is a breakdown of the Ops Manual costs:

Operations Manual	Role	Rate/hr	Hours	Total
Sarah Ensslin	SOP development	$130	24	$ 3,120
Mike Chaulk	QA/QC	$ 180	6	$ 1,080
Michael Brophy	SOP writing	$ 85	52	$ 4,420
Alysha Mogensen	Clerical Support	$ 65	8	$ 520
Expenses				$ 860
Totals			90	$ 10,000

And here a breakdown of the Contingency Plan:

Operations Manual	Role	Rate/hr	Hours	Total
Sarah Ensslin	Contingency Plan development	$130	6	$780
Mike Chaulk	QA/QC	$180	1	$180
Michael Brophy	Contingency Plan writing	$85	10	$850
Alysha Mogensen	Clerical Support	$65	2	$130
Expenses				$60
Totals			19	$2,000

Please let me know if you have any questions or want to discuss.

Regards,
Sarah

Document No:
Meeting: Nov 24 2020 Council
Circulate: Council, LD, PB, IT, DMc
File: Tannery Road Sidewalk Capital

M E M O R A N D U M

TO: **TOWN COUNCIL**

FROM: **IAN TILLARD, CONSULTING TOWN ENGINEER**

DATE: **NOVEMBER 18, 2020**

RE: **PROPOSED NEW SIDEWALK ALONG NORTH SIDE TANNERY ROAD**

---

1. FACTS

The proposed sidewalk for the north side of Tannery Road has been in the planning stage for a number of years. In 2018 ABLE Engineering created a survey and a layout sketch and preliminary costs estimates for this project.

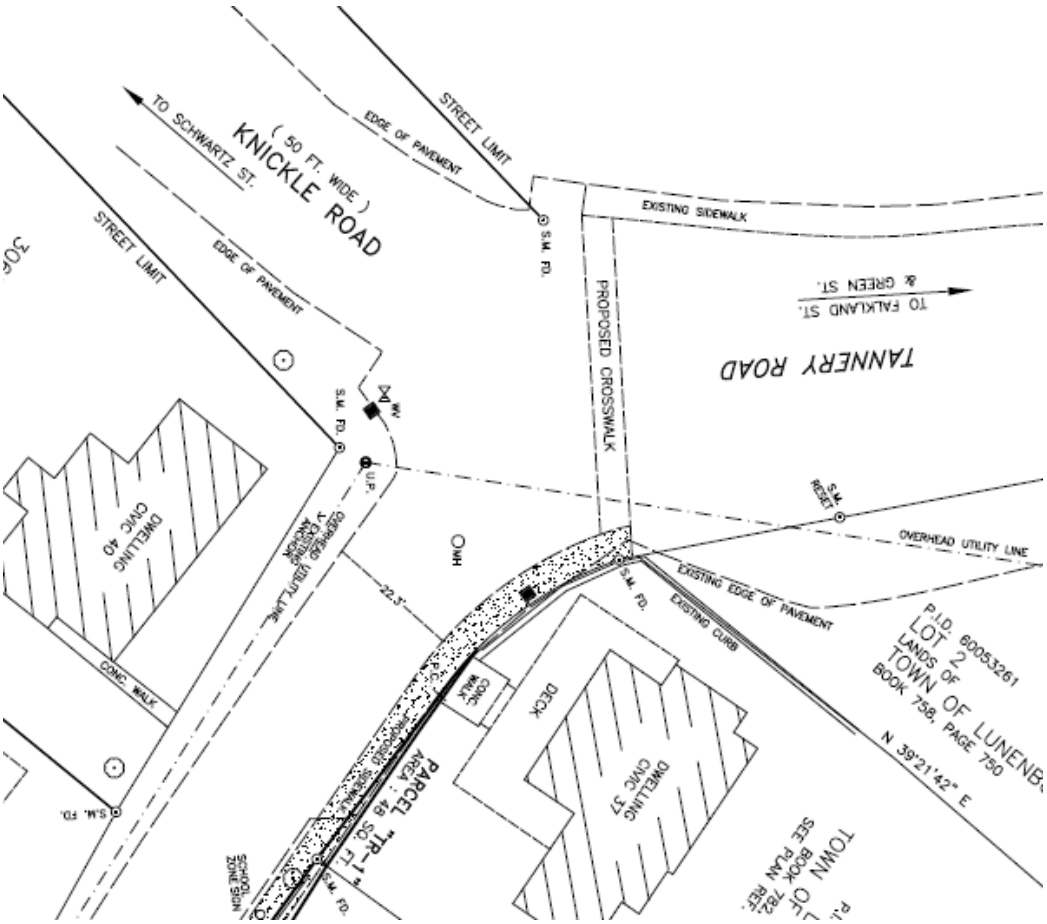
The project will require new property agreements as the original agreements that were negotiated were not completed because the sidewalk layout and construction plan was not finalized by the Department.

A staff report was prepared for the May 12, 2020 Council meeting recommending that the project be undertaken by a contractor or traffic calming measures be put in place (see: attached). These options were not approved by the previous Council which instead asked Public Works to report on the feasibility of undertaking this as an internal project. This memo outlines that plan.

2. ISSUES AND OPTIONS ANALYSIS

The sidewalk design runs along the north side of Tannery Road from the parking lot on the north side of the Walters house to the park area by the seawall. Access to the sidewalk from the south side of Tannery Road requires a new crosswalk from the south west corner of the intersection of Tannery Road and Knickle Road. Access from the north side is across the parking lot in front of the old School Annex.

Alternative routes have been examined and there was some discussion with some landowners about the alternatives. In the end, the alternatives were not deemed feasible and the best routing is as per the original layout as set out in the Able Engineering 2018 design. See the attached plans. Of particular interest is the crosswalk entry point to the sidewalk, highlighted below;



Schedule

The schedule for the work for an in-house project is estimated as follows:

Phase 1 Pre-Construction:
Land purchase: +4 months (subject to consent)

Phase 2:

- Tree removal (contractor): 1 week
- Power pole work (contractor); 1 week
- Town forces work Phase 1: 3 weeks
- Total = 5 weeks

Phase 3:

- Town forces work: 5 weeks
- Total = 5 weeks

Total project duration after land agreements is: 10 weeks.

Phase 2 and Phase 3 could be considered as separate projects or as one project. If separate, Phase 2 would result in a gravel path that could be utilized for a period of time. Phase 3 could then be done on a separate schedule as

funding and resources permit. One issue with this approach is that the Town would have a gravel sidewalk to maintain which presents issues for snow and ice clearing and may be a safety concern.

Priority Considerations

As the majority of the work is presented as being done by Town forces and the duration of that part of the work is 8 weeks in total, there would be a significant impact on the ability of the Public Works Department to carry out other recurring maintenance work as well as other projects – even if the project were to be separated into two phases. This project would consume a significant amount of the available time in 2021 for outdoor projects. Aside from the normal maintenance activities such as sidewalk repairs, road repairs, building maintenance, grounds maintenance. There are other one-off projects such as the sewer upgrade on Archibald Street (that the Town has committed to doing in 2021), storm and sewer separation projects that have been identified by consultants (the first of these which is for Green and Knickle Streets area which has been identified as a priority project for 2021). Each of these latter two projects is a week duration. This project needs to be considered in light of priorities and the limited resources available.

Quality Considerations

This project does not involve complex infrastructure. It is reasonable to expect that there would be a good outcome with a third party contractor. Whereas, underground water and sewer systems in this Town are older in many cases and complex in their layouts. The Town PW forces are familiar with these systems and are best suited to deal with work related to them. And as these systems are more critical, they should be the focus of the Town PW Department in order to protect these assets. This should be another factor in considering the best approach to the Tannery Road sidewalk project.

3. FINANCIAL IMPACT

Project Costs:

Phase 1 Pre-Construction:

- Land purchase costs: $30,000 approx.
- Property Owners legal cost reimbursement: $5,000 approx.
- Survey costs related to land sales: $5,000 approx.
- Town legal for land ownership transactions: $15,000 approx.

Total pre-construction: $55,000

Phase 2:

- Tree removal. Contracted service at $1,800 per tree @ 13 trees plus property restitution total; $26,000
- Traffic Control during tree removal. Contracted service; $5,000
- Install alley arms for guy wires on 3 power poles. Contracted service with NSPI; $20,000 (estimate)

- Town PW work
  - Remove stumps and grub entire length of sidewalk to 8 inch depth
  - Fill in soft areas with Class C
  - Lay and compact Class A along entire length
  - Total $15,000 material and labour
- Permanent traffic control measures: $5,000

Total Phase 2 construction: $71,000

Phase 3:

- Town forces concrete placement; $68,000
- Replanting of trees; $6,000

Total Phase 3 construction: $74,000

Total project costs: $200,000

The 2020/21 approved Capital budget included $255,000 for this project with funding of $115,000 from Deed Transfer Taxes and the balance from a Capital borrowing. If this is phased in over two years, the extent of a Capital borrowing could be reduced if there are additional Deed Transfer Taxes.

4. STRATEGIC PLAN RELEVANCE

This project addresses the Comprehensive Community Plan Strategic Direction Goals: 1. Community Structure; 3. Servicing and Facilities; 4. Mobility; and 7. Urban Design.

5. RECOMMENDATION AND DRAFT MOTION

It is recommended that Council approve the following draft motion.

Draft Motion:

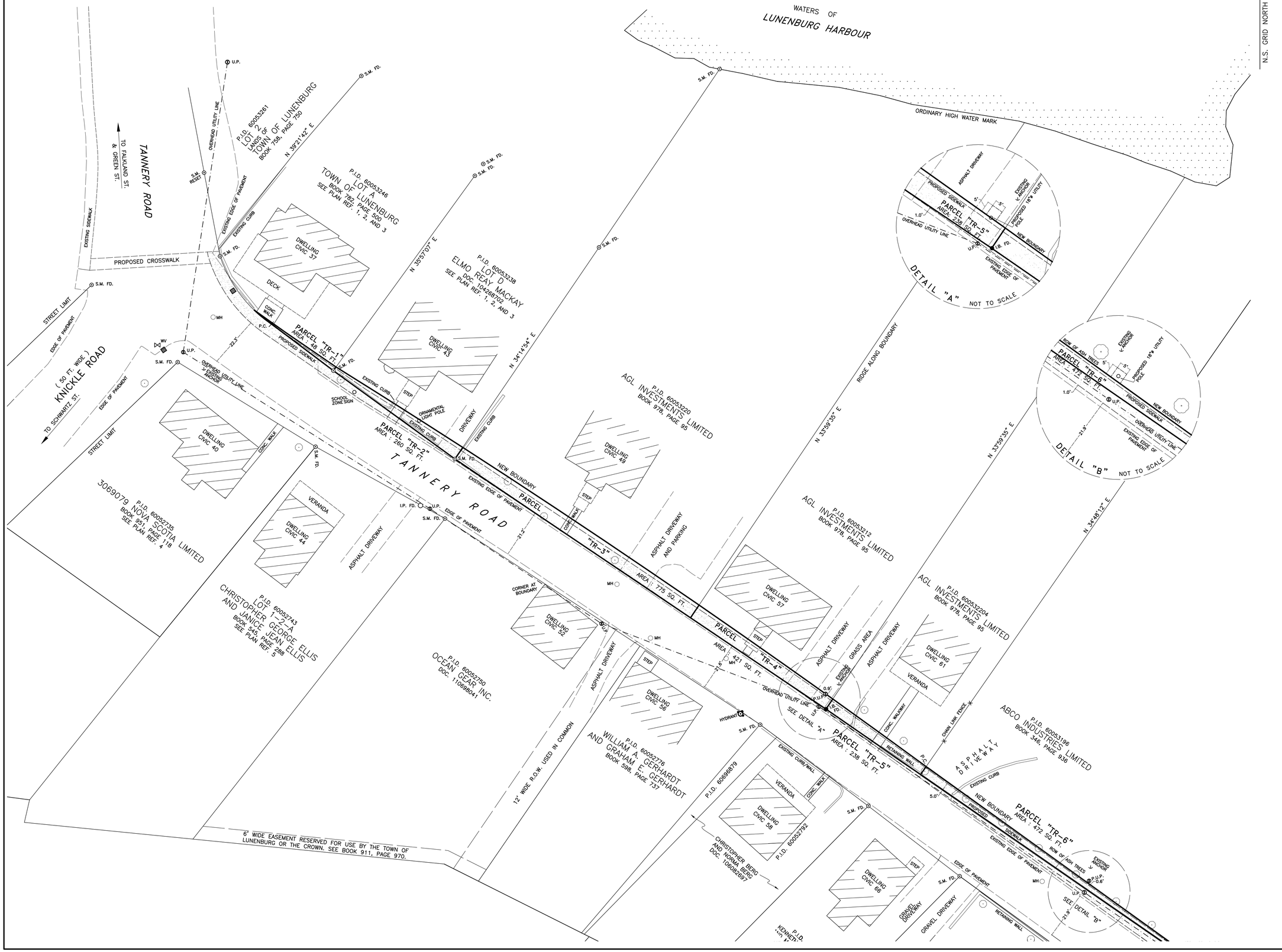
To proceed with Phase 1 Pre-Construction of the project to secure the land agreements.

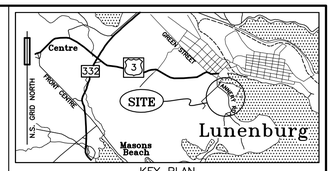
Once the land is secured to issue a Design-build RFP for the design and construction of a new sidewalk along the north side of Tannery Road for construction in 2022 depending on budget capacity.

Encls.

Acknowledged only by:

Bea Renton
CAO





KEY PLAN

TOPO MAP NO. 21 A 8 SCALE 1 / 50,000

LEGEND :

⊙ S.M.	SURVEY MARKER (IRON BAR WITH ID CAP)	◇ C.P.	CALCULATED POINT
○ I.B.	IRON BAR	(C)	CALCULATED
● R.P.	ROCK POST	(M)	MEASURED
○ I.P.	IRON PIPE	(P)	PLAN
□ T.P.	TRAVERSE POINT	FD.	FOUND
✕ M.N.	MAGNETIC NAIL	⊕ U.P.	UTILITY POLE
⊠ W.P.	WOOD POST	R.	RADIUS
N.S.C.M.	NOVA SCOTIA CO-ORDINATE MONUMENT	A.	ARC
		P.C.	POINT OF CURVATURE
N.S.H.P.N.	NOVA SCOTIA HIGH PRECISION NETWORK	P.R.C.	POINT OF REVERSE CURVATURE
N.S.A.C.S.	NOVA SCOTIA ACTIVE CONTROL STATION	×—×—×	FENCE
		———	BOUNDARY CERTIFIED BY THIS PLAN
L.R.O.	LAND REGISTRATION OFFICE	— — —	R.O.W. BOUNDARY
R.O.W.	RIGHT-OF-WAY	MH	MANHOLE
▩	CATCH BASIN	WV	WATER VALVE
⊙	LARGE TREE	⊕ P.U.P.	PROPOSED UTILITY POLE

GRID BEARINGS ARE REFERENCED TO THE NOVA SCOTIA 3° MODIFIED TRANSVERSE MERCATOR PROJECTION, ZONE 5, CENTRAL MERIDIAN 64° 30' WEST LONGITUDE.
HORIZONTAL REFERENCE FRAME OF NAD83 (CSRS), EPOCH 2010.0

NAD83 (CSRS) CONTROL COORDINATES WERE DERIVED VIA THE NOVA SCOTIA HIGH PRECISION NETWORK. (G.N.S.S. OBSERVATIONS)

DISTANCES SHOWN ON THE PLAN ARE GROUND DISTANCES UNLESS OTHERWISE STATED, MEASURED USING A COMBINATION OF TOTAL STATION AND DERIVED G.N.S.S. GROUND DISTANCES.

SCALE FACTOR NOT APPLIED.

VALUES SHOWN ARE UNADJUSTED.

FIELD SURVEYS CARRIED OUT
SEPTEMBER 2002 – MAY 2003, JULY 2015

PLAN REFERENCES:

1. PLAN OF SURVEY OF PROPERTY OF ANGUS J. WALTERS, DATED 4TH OCTOBER, 1956 BY ERROL B. HEBB. REGISTRY No. 8883.

2. PLAN OF SURVEY OF LANDS OF LUNENBURG FOUNDRY AND ENGINEERING LTD., DATED 27TH FEBRUARY, 1991 BY ERROL B. HEBB. REGISTRY No. 8311.

3. PLAN OF SURVEY OF LANDS OF LUNENBURG FOUNDRY AND ENGINEERING LTD., DATED 19TH SEPTEMBER, 1978 BY ERROL B. HEBB. REGISTRY No. P–3764.

4. PLAN SHOWING PROPERTY OF DAVID M. KEEPING, LOCATED AT 40 TANNERY ROAD, LUNENBURG COUNTY. DATED 12TH NOVEMBER, 1984 BY ROBERT C. BECKER. REGISTRY No. P–5491

5. PLAN OF SUBDIVISION OF PROPERTIES OF SARAH S. GREEK AND BARBARA EISENHAUER, DATED 8TH SEPTEMBER, 1992 BY E. TURNER. REGISTRY No. 9113.

6. PLAN OF SURVEY SHOWING PROPERTY OF KENNETH P. DEUEL, DATED 26TH MARCH, 1990 BY ROBERT C. BECKER. REGISTRY No. 7861

7. PLAN SHOWING PROPERTY OF JOHN C. WORDEN AND NORMA E. WORDEN. TOWN OF LUNENBURG, LUNENBURG COUNTY, DATED 6TH JANUARY, 1998 BY L.W. BERRIGAN. REGISTRY No. 84654137.

8. PLAN OF SURVEY SHOWING PROPERTY OF WILFRED L. EISNOR AND MARILYN L. EISNOR, TANNERY ROAD, LUNENBURG COUNTY. DATED 5TH SEPTEMBER, 2003 BY ROBERT C. BECKER. REGISTRY No. 12500.

9. PLAN OF SUBDIVISION SHOWING LOT 1 AND LOT 2, PROPERTY OF TYLER ROBERT HAYDEN, LUNENBURG, LUNENBURG COUNTY. DATED 26TH JULY, 2017 BY PETER A. A. BERRIGAN. REGISTRY No. 111445111.

10. PLAN OF SUBDIVISION SHOWING LOT 09–1 AND REMAINDER LOT 09–2, LANDS OF KATHERINE JANE OSLER, TANNERY ROAD, LUNENBURG COUNTY. DATED 2ND OCTOBER, 2009 BY ROBERT C. BECKER. REGISTRY No. 94988178.

SKETCH

REV.		DATE

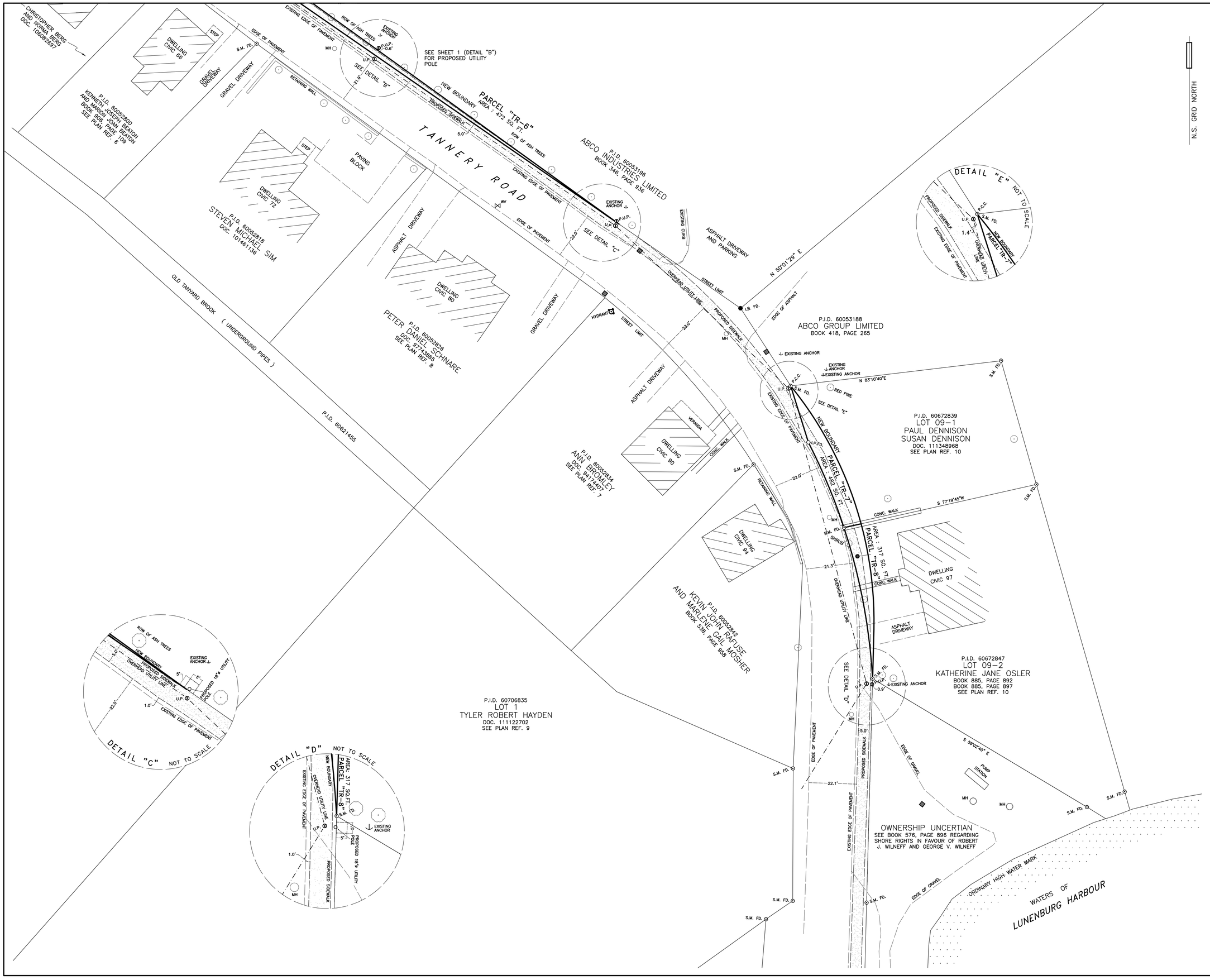
SKETCH SHOWING PORTIONS OF
TANNERY ROAD,
PARCELS TR–1 TO TR–8 INCLUSIVE,
TANNERY ROAD,
LUNENBURG,
LUNENBURG COUNTY, NOVA SCOTIA.

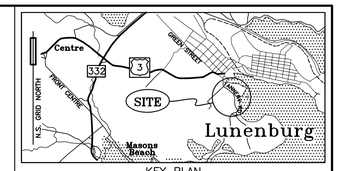
SHEET 1 OF 2

SCALE	1" = 20'	SURVEYED	ROBERT C. BECKER
DATE	(DD/MM/YY) 07/02/18	PROJ. NAME	TANNERY ROAD
DRN.	E.B.O.	DWG. NO.	150706–04–2018

0 20 40 60

ABLE ENGINEERING SERVICES INC.
4073 HIGHWAY #3 P.O. BOX 959 CHESTER, NOVA SCOTIA, B0J 1J0
TEL. 1-833-756-8433 FAX: 902-273-3072
Email: surveying@ableinc.ca www.ableinc.ca





KEY PLAN

TOPO MAP NO. 21 A 8 SCALE 1 / 50,000

LEGEND :

⊙ S.M.	SURVEY MARKER (IRON BAR WITH ID CAP)	◇ C.P.	CALCULATED POINT
○ I.B.	IRON BAR	(C)	CALCULATED
● R.P.	ROCK POST	(M)	MEASURED
○ I.P.	IRON PIPE	(P)	PLAN
□ T.P.	TRAVERSE POINT	FD.	FOUND
× M.N.	MAGNETIC NAIL	⊕ U.P.	UTILITY POLE
⊠ W.P.	WOOD POST	R.	RADIUS
N.S.C.M.	NOVA SCOTIA CO-ORDINATE MONUMENT	A.	ARC
		P.C.	POINT OF CURVATURE
N.S.H.P.N.	NOVA SCOTIA HIGH PRECISION NETWORK	P.R.C.	POINT OF REVERSE CURVATURE
N.S.A.C.S.	NOVA SCOTIA ACTIVE CONTROL STATION	×—×—×	FENCE
		———	BOUNDARY CERTIFIED BY THIS PLAN
L.R.O.	LAND REGISTRATION OFFICE	———	R.O.W. BOUNDARY
R.O.W.	RIGHT-OF-WAY	MH	MANHOLE
▩	CATCH BASIN	WV	WATER VALVE
⊙	LARGE TREE	⊕ P.U.P.	PROPOSED UTILITY POLE

GRID BEARINGS ARE REFERENCED TO THE NOVA SCOTIA 3° MODIFIED TRANSVERSE MERCATOR PROJECTION, ZONE 5, CENTRAL MERIDIAN 64° 30' WEST LONGITUDE.
HORIZONTAL REFERENCE FRAME OF NAD83 (CSRS), EPOCH 2010.0

NAD83 (CSRS) CONTROL COORDINATES WERE DERIVED VIA THE NOVA SCOTIA HIGH PRECISION NETWORK. (G.N.S.S. OBSERVATIONS)

DISTANCES SHOWN ON THE PLAN ARE GROUND DISTANCES UNLESS OTHERWISE STATED, MEASURED USING A COMBINATION OF TOTAL STATION AND DERIVED G.N.S.S. GROUND DISTANCES.

SCALE FACTOR NOT APPLIED.

VALUES SHOWN ARE UNADJUSTED.

FIELD SURVEYS CARRIED OUT
SEPTEMBER 2002 – MAY 2003, JULY 2015

PLAN REFERENCES:

1. PLAN OF SURVEY OF PROPERTY OF ANGUS J. WALTERS, DATED 4TH OCTOBER, 1956 BY ERROL B. HEBB. REGISTRY No. 8883.

2. PLAN OF SURVEY OF LANDS OF LUNENBURG FOUNDRY AND ENGINEERING LTD., DATED 27TH FEBRUARY, 1991 BY ERROL B. HEBB. REGISTRY No. 8311.

3. PLAN OF SURVEY OF LANDS OF LUNENBURG FOUNDRY AND ENGINEERING LTD., DATED 19TH SEPTEMBER, 1978 BY ERROL B. HEBB. REGISTRY No. P-3764.

4. PLAN SHOWING PROPERTY OF DAVID M. KEEPING, LOCATED AT 40 TANNERY ROAD, LUNENBURG COUNTY. DATED 12TH NOVEMBER, 1984 BY ROBERT C. BECKER. REGISTRY No. P-5491

5. PLAN OF SUBDIVISION OF PROPERTIES OF SARAH S. GREEK AND BARBARA EISENHAUER, DATED 8TH SEPTEMBER, 1992 BY E. TURNER. REGISTRY No. 9113.

6. PLAN OF SURVEY SHOWING PROPERTY OF KENNETH P. DEUEL, DATED 26TH MARCH, 1990 BY ROBERT C. BECKER. REGISTRY No. 7861

7. PLAN SHOWING PROPERTY OF JOHN C. WORDEN AND NORMA E. WORDEN. TOWN OF LUNENBURG, LUNENBURG COUNTY, DATED 6TH JANUARY, 1998 BY L.W. BERRIGAN. REGISTRY No. 84654137.

8. PLAN OF SURVEY SHOWING PROPERTY OF WILFRED L. EISNOR AND MARILYN L. EISNOR, TANNERY ROAD, LUNENBURG COUNTY. DATED 5TH SEPTEMBER, 2003 BY ROBERT C. BECKER. REGISTRY No. 12500.

9. PLAN OF SUBDIVISION SHOWING LOT 1 AND LOT 2, PROPERTY OF TYLER ROBERT HAYDEN, LUNENBURG, LUNENBURG COUNTY. DATED 26TH JULY, 2017 BY PETER A. A. BERRIGAN. REGISTRY No. 111445111.

10. PLAN OF SUBDIVISION SHOWING LOT 09-1 AND REMAINDER LOT 09-2, LANDS OF KATHERINE JANE OSLER, TANNERY ROAD, LUNENBURG COUNTY. DATED 2ND OCTOBER, 2009 BY ROBERT C. BECKER. REGISTRY No. 94988178.

SKETCH

REV.		DATE

SKETCH SHOWING PORTIONS OF
TANNERY ROAD,
PARCELS TR-1 TO TR-8 INCLUSIVE,
TANNERY ROAD,
LUNENBURG,
LUNENBURG COUNTY, NOVA SCOTIA.

SHEET 2 OF 2

SCALE	1" = 20'	SURVEYED	ROBERT C. BECKER
DATE	(DD/MM/YY) 07/02/18	PROJ. NAME	TANNERY ROAD
DRN.	E.B.O.	DWG. NO.	150706-04-2018

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MEETING NOTES

PROJECT LUNENBURG

Steering Team Meeting

Wednesday, November 4, 2020 at 3:00 p.m.

Via Zoom Webinar

PRESENT:

Voting members of the Steering Team:
Mayor Elect Matt Risser, Chair
Councillor Peter Mosher
Councillor Susan Sanford
Peter Goforth, Qualified Expert
Cheryl Lamerson, Citizen Representative
Bill Rice, Citizen Representative
Gerry Rolfsen, Qualified Expert

Non-voting, ex-officio members:
Rachel Bailey
Terry Drisdelle, Senior Planner, Develop Nova Scotia
Norma Schiefer, Development Officer, Municipality of the District of Lunenburg (departed at 3:15 p.m.; returned at 3:45 p.m.)
Dawn Sutherland, Planning/Development Manager (PDM)

ALSO PRESENT: Steffen Käubler, Upland Planning and Design Studio
Heather McCallum, Assistant Municipal Clerk
Bea Renton, CAO

The Chair, Mayor Elect Risser, called the meeting to order at 3:02 pm.

1. Agenda

Motion: moved and seconded that the agenda be approved, as presented. Motion carried.

2. Review of notes from previous meeting – July 8 updated & September 16, 2020

Motion: moved and seconded that the meeting notes of July 8 (updated) and September 16, 2020 be approved, as presented. Motion carried.

3. Unfinished Business

Nil.

4. New Business

   a. Review of Progress Report

The PDM gave a verbal review of the progress report for September 1-October 31, 2020 (Schedule "A").

Item 4 regarding UPLAND's internal cost overruns is a contractual discussion and will be reviewed in camera.

   b. Next Steps

Timeline for the planning documents: UPLAND will provide a letter on November 6, 2020 with their proposed milestones and proposed dates. Unofficially, the documents are expected in early 2021 to the Planning Advisory Committee.

5. Correspondence

Nil.

6. In camera portion – motion to recess to meet in camera to consider contract negotiations/matters (Section 22 *Municipal Government Act*)

Motion: moved and seconded to meet in camera to consider contractual negotiations pursuant to section 22 of the Municipal Government Act. Motion carried.

7. Resumption of Council meeting in public session – motion to consider any in camera meeting recommendations (Section 22 *Municipal Government Act*)

3:53 p.m. – The Steering Team resumed in public.

There were no Committee in camera meeting recommendations to consider.

8. Next Meeting Dates

Steering Team meeting: *Special meeting TBD; Wednesday, December 9, 2020 at 3:00 p.m.*

9. Adjournment

Motion: Moved and seconded that, there being no further business, the meeting be adjourned. Motion carried.

The meeting was adjourned at 3:55p.m.

Heather McCallum
Assistant Municipal Clerk

UPLAND
Planning +
Design Studio

63 King Street
Dartmouth, Nova Scotia B2Y 2R7
+1 (902) 423 0649
info@uplandstudio.ca

PROGRESS REPORT

30
October
2020

PROJECT: Town of Lunenburg Comprehensive Plan
REPORTING PERIOD: September 1 - October 31, 2020

1. Targets Achieved in Period
- 3.12. Final Comprehensive Plan

2. Outputs of Project
- Council Presentation

3. Project Related Issues
- Council accepted the Comprehensive Community Plan on September 22, 2020.
- Leading up to the municipal election on October 17, 2020 and during the two weeks following the election, the project has been on hold.

4. Risk Analysis
- UPLAND has had significant cost overruns in phases 1 to 3 of the project and wishes to discuss how to mitigate further losses.

5. What to Achieve in Next Period
- 3.13. Plan Wall Calendar Mail-Out
- 4.1. Draft Planning Documents

MEETING NOTES

PROJECT LUNENBURG

Steering Team Special Meeting

Wednesday, November 18, 2020 at 4:00 p.m.

Via Zoom Meeting

PRESENT:	**Voting members of the Steering Team:** Councillor Susan Sanford, Chair Councillor Peter Mosher Councillor Stephen Ernst Peter Goforth, Qualified Expert Cheryl Lamerson, Citizen Representative (arrived 4:31 p.m.) Bill Rice, Citizen Representative **Non-voting, ex-officio members:** Mayor Matt Risser Terry Drisdelle, Senior Planner, Develop Nova Scotia Dawn Sutherland, Planning/Development Manager (PDM)
ALSO PRESENT:	Steffen Käubler, UPLAND Planning and Design Studio (departed 4:22 p.m.) Arthur MacDonald, Heritage Manager Heather McCallum, Assistant Municipal Clerk Bea Renton, CAO
ABSENT:	Gerry Rolfsen, Qualified Expert Norma Schiefer, Development Officer, Municipality of the District of Lunenburg

The Chair, Councillor Sanford, called the meeting to order at 4:00 p.m.

1. Agenda

Motion: moved and seconded that the agenda be approved, as presented. Motion carried.

2. Review of notes from previous meeting – November 4, 2020

The PDM noted that Bea Renton is missing from the attendance list for both sets of minutes.

Motion: moved and seconded that the meeting notes of November 4, 2020 be

approved, with revision as noted. Motion carried.

3. Unfinished Business

Nil.

4. New Business

   a. Review of Revised Gantt Chart

The PDM noted that hours will be added to the chart on UPLAND's end. In response to a question, the PDM explained that the Province requires a 90-day review after the documents pass second reading before the new bylaws are in effect.

Mr. Käubler presented the revised timeline for Project Lunenburg (Schedule "A").

Motion: Moved and seconded to approve the updated project Gantt chart schedule as presented. Motion carried.

5. Correspondence

Nil.

6. In camera portion – motion to recess to meet in camera to consider contract negotiations/matters (Section 22 *Municipal Government Act*)

Motion: moved and seconded to meet in camera to consider contractual negotiations pursuant to section 22 of the Municipal Government Act. Motion carried.

7. Resumption of Council meeting in public session – motion to consider any in camera meeting recommendations (Section 22 *Municipal Government Act*)

4:45 p.m. – The Steering Team resumed in public.

There were no Committee in camera meeting recommendations to consider at this time.

8. Next Meeting Dates

Steering Team meeting: *Wednesday, December 9, 2020 at 3:00 p.m. (Zoom)*

9. Adjournment

Motion: Moved and seconded that, there being no further business, the meeting be adjourned. Motion carried.

The meeting was adjourned at 4:46 p.m.

_____

Heather McCallum
Assistant Municipal Clerk

Project: Lunenburg

PROJECT DUE: Jun 19, 2020

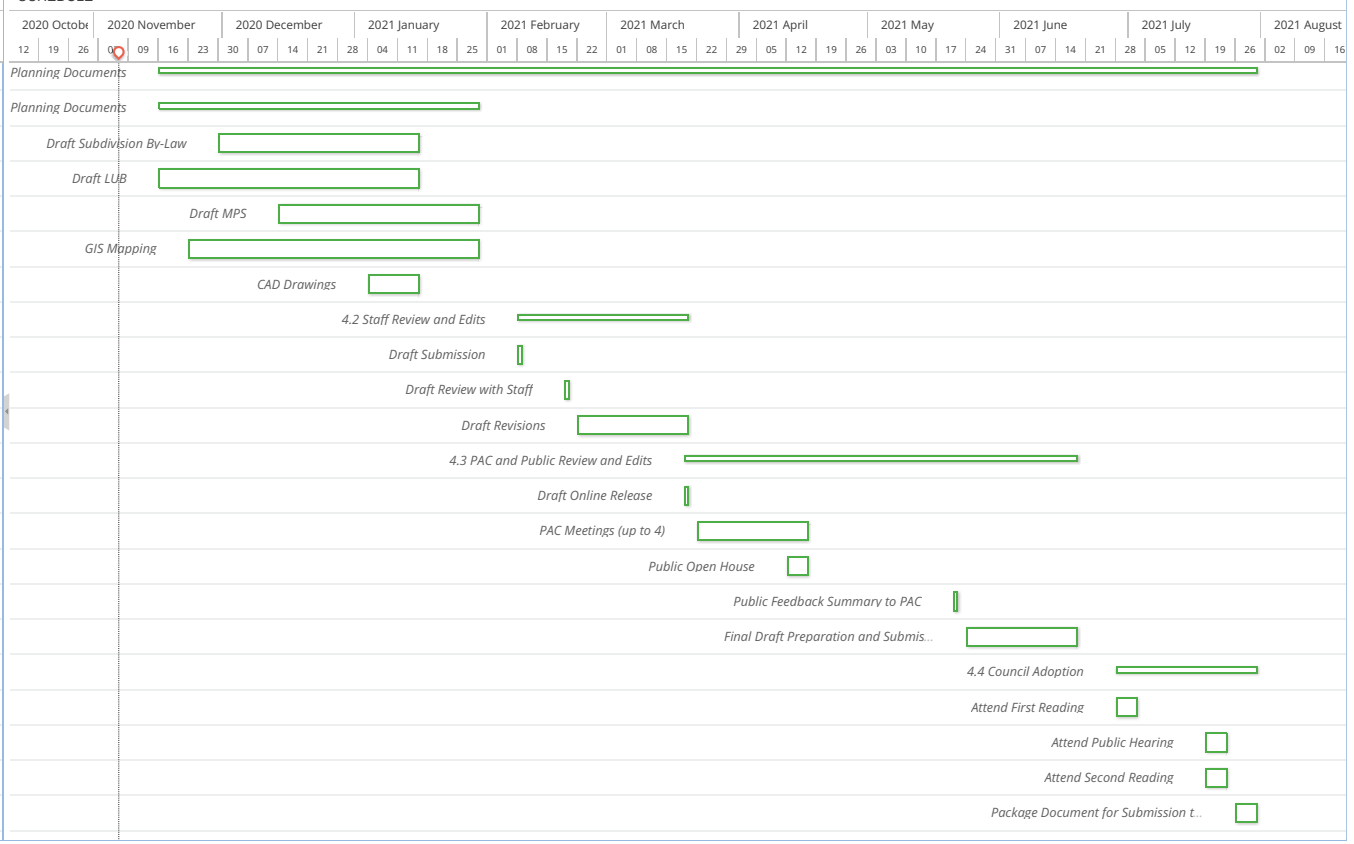
SCHEDULE "A"

Search for a task... | Collapse All | Expand All | Zoom to Fit | Default View | Week | Month | Year | Last Task | Critical Path | Cascade | Print

TASKS

#	TASKS	START	FINISH
9	4.0 Planning Documents	Nov 16, 2020	Jul 30, 2021
10	4.1 Draft Planning Documents	Nov 16, 2020	Jan 29, 2021
11	Draft Subdivision By-Law	Nov 30, 2020	Jan 15, 2021
12	Draft LUB	Nov 16, 2020	Jan 15, 2021
13	Draft MPS	Dec 14, 2020	Jan 29, 2021
14	GIS Mapping	Nov 23, 2020	Jan 29, 2021
15	CAD Drawings	Jan 04, 2021	Jan 15, 2021
16	4.2 Staff Review and Edits	Feb 08, 2021	Mar 19, 2021
17	Draft Submission	Feb 08, 2021	
18	Draft Review with Staff	Feb 19, 2021	
19	Draft Revisions	Feb 22, 2021	Mar 19, 2021
20	4.3 PAC and Public Review and Edits	Mar 19, 2021	Jun 18, 2021
21	Draft Online Release	Mar 19, 2021	
22	PAC Meetings (up to 4)	Mar 22, 2021	Apr 16, 2021
23	Public Open House	Apr 12, 2021	Apr 16, 2021
24	Public Feedback Summary to PAC	May 21, 2021	
25	Final Draft Preparation and Submission	May 24, 2021	Jun 18, 2021
26	4.4 Council Adoption	Jun 28, 2021	Jul 30, 2021
27	Attend First Reading	Jun 28, 2021	Jul 02, 2021
28	Attend Public Hearing	Jul 19, 2021	Jul 23, 2021
29	Attend Second Reading	Jul 19, 2021	Jul 23, 2021
30	Package Document for Submission to Provi...	Jul 26, 2021	Jul 30, 2021

SCHEDULE



JOINT OCCUPATIONAL HEALTH AND SAFETY COMMITTEE MEETING MINUTES

THURSDAY, NOVEMBER 5, 2020 AT 11:00 A.M.

VIA ZOOM VIDEO CONFERENCE

PRESENT: Paul Bracken, Facilities Superintendent/Safety Officer (SO), Public Works (Co-Chair)
Bobby Cleveland, Facilities Attendant, Recreation (Co-Chair) (arrived 11:05 a.m.)
Katie MacMillan, Business Coordinator, Corporate Services
Gary Mossman, Fire Hall Superintendent, Fire Department
Taylor Rombaut, Water Resource Operator, Public Works

ALSO PRESENT: Ann Covey, Recording Secretary
Dennis MacPherson, Town Engineer
Bea Renton, CAO

ABSENT: Trevor Lohnes, Operator, Public Works

---

1. Call to Order

The Co-Chair and Safety Officer, Paul Bracken, called the meeting to order at 11:04 a.m.

2. Acknowledgement of Mi'kma'ki the ancestral and unceded territory of the Mi'kmaq People

The Co-Chair noted that the Town is located on unceded territory of the Mi'kmaq People.

3. Agenda

The meeting agenda approved by consensus.

4. October 1, 2020 Joint Occupational Health and Safety Committee meeting minutes

The October 1, 2020 meeting minutes were approved by consensus.

5. Unfinished Business

   a. COR Certification gap assessment audit for Town from Construction Safety Nova Scotia - complete

The SO said with the internal audit complete, Construction Safety Nova Scotia will begin their external audit of all Town facilities. Lori Ross, CSNS Auditor, will visit each Town

Department on December 8 & 9. At that time any deficiencies will be identified, which the Town will then have 90 days to correct.

More information will be forthcoming on the December inspections. Safety Bulletin Boards need to be checked to ensure they are up to date before these visits. The SO will provide the Staff Training Schedule to be added to all Safety Bulletin Boards.

6. New Business

a. COVID-19 Update – Departments' overview by JOHSC reps

Public Works

- Staff continue to follow Provincial standards to maintain social distance and increase sanitization. They will monitor and will revisit as necessary.
- The SO introduced Dennis MacPherson, the new Town Engineer.
- The COVID plan has been re-assessed for any required updates.

Fire Department

- The gathering limit for the Fire Hall Auditorium is 50 as per Provincial standards.
- A fogger is being purchased to speed up disinfection.

Recreation

- Facing challenges with recreation facilities reopening. Issues with dressing rooms and showers have been addressed.

Corporate Services

- Public open hours as per usual.
- New Town Council elected and will be meeting in person with masks as per Provincial requirements.
- The Council Swearing In Ceremony is scheduled for November10 at the Fire Hall and will be restricted to 50 people with face masks and social distancing also because of the Provincial pandemic Health Order.
- Staff's ongoing commitment to personal and public health during the sustained Health Order recognized and appreciated.

WWTP

- Dalhousie research group are on site 3-4 times per week, isolating themselves in lab.

b. Department bi-monthly safety inspections

Safety inspection reports were received.

The SO said that once received they are passed along to Ann Covey, who scans them to a file and enters any deficiencies into an ongoing maintenance log to be addressed.

c. Incident Reports – slip on Arena ice

There was one incident reported on October 14 where someone slipped and fell after stepping from the ice surface to a more slippery, newly sprayed area. There was no

injury. The RD is looking into getting non-slip spikes for shoes for those not accustomed to being on the Arena ice.

d. Safety and Wellness Training Schedule

- First Aid Training – Public Works/Recreation – October 27
- Traffic Signer Course – Public Works – November 2 & 3

The SO received good feedback on both of these Safety NS courses, despite COVID restrictions preventing any hands on aspect of the training.

The SO asked the Committee for suggestions for future training. There were none at this time.

e. Other

The Fire Hall Superintendent mentioned an issue with vehicles driving in the wrong direction on Medway Street, which is one-way. He suggested increased signage to help prevent this. The SO said the Town Engineer has obtained a Provincial Traffic Authority contact, who will be consulted for signage or paint suggestions to improve the situation on Medway Street. The Fire Hall Superintended said that electronic mapping applications, such as Google Maps, should be updated to show Medway Street as one way.

7. Next Committee meeting dates – *Thursday, January 7, 2021 at 11:00 a.m. Location (TBA online or in-person).*

8. Adjournment

The meeting was adjourned by consensus at 11:22 a.m.

_____

Ann Covey, Recording Secretary for
Heather McCallum, Asst. Municipal Clerk

Kelly Jardine

Subject: FW: Masonic crest

From: Phillip & Peggy Langford <plangford@eastlink.ca>
Date: October 21, 2020 at 2:54:08 PM ADT
To: Bea Renton <brenton@explorelunenburg.ca>
Cc: Mike Lutes <lutes.mgc@gmail.com>
Subject: Masonic crest

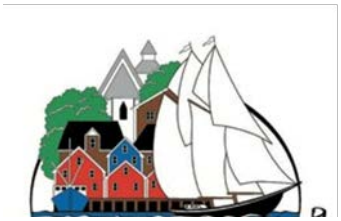
Good Afternoon Bea Hope all is well with you

I am writing you to find out if the Masonic Lodge is able to use the attached design for a crest we wish to have made for our 200th anniversary. As you may or may not be aware this coming year, 2021, will be the 200th anniversary since a Masonic Lodge was formed in Lunenburg. The Constitution of our Grand Lodge of Nova Scotia allows Grand Lodge to receive and approve requests from its member Lodges to become Distinctive Lodges for specific milestones. This entails approval of a designed crest to be worn on our aprons. Unity Lodge being the fourth Lodge to have registered within the jurisdiction of Nova Scotia when the Grand Lodge was formed back in the 1800's has an old and varied history with the Town and its descendants many of whom have become Masons throughout the years. We also have a strong connection to the Bluenose as three of the four owners were Masons as well as the designer and the original Bluenose carried the masonic crest on her stern for many years. Due to these facts we feel it would be appropriate to use the Town design as one of three of our submissions to Grand Lodge for its selection should they give approval to become a Distinctive Lodge. We are suggesting that the Town Logo with the Bluenose out front , the Lodge name and dates be incorporated on a 3 inch diameter circle with a blue embroidered edge around the crest would make up the design. We hope the town would look favourably on our request to use its Logo as it would be a nice addition to our aprons should it be given approval by Grand Lodge as well as a recognition of Lunenburg when we travel abroad. Hopefully this is the correct venue to ask permission to use the logo. If not please direct me as to where I need to go.

Thanks for your assistance and look forward to a favourable response.

Fraternally
Rt W Bro Phil Langford
WM Unity Lodge # 4 GLNS

Unity Lodge # 4



1821-2021

#24. TOWN OF LUNENBURG POLICY

SALE, REPRODUCTION AND USE OF THE TOWN'S FLAG AND LOGO

I. Policy Objective

The purpose of this policy is to establish terms and conditions for the reproduction, use and sale of the Town of Lunenburg's flag and logo. Both the Town's flag and logo have copyright and trademark protection.

II. Procedure

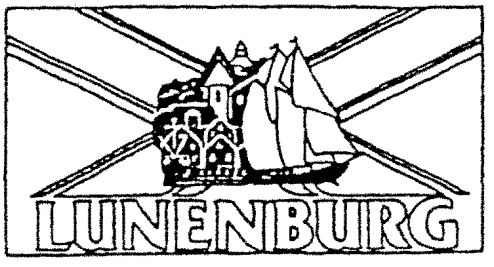
1. The official flag and logo of the Town of Lunenburg are depicted in Schedules "A" and "B" respectively as attached hereto.

2. The aforesaid flag and logo shall be made available to the public for sale, reproduction or use at such price and other conditions as the Lunenburg Town Council may determine from time to time by Resolution.

3. Any person seeking to purchase, reproduce or otherwise use the aforesaid flag and/or logo, must make written application to the Lunenburg Town Council in the form attached hereto as Schedule "C" except as otherwise provided by Town Council

4. The Town of Lunenburg's flag and logo shall be used in an appropriate and respectful manner at all times and may not be desecrated, altered or added to in any fashion. Further, any authorized sale, reproduction or use of the flag and/or logo must clearly identify the flag and/or logo as that of the Town of Lunenburg.

Schedule "A"



The Registrar hereby gives public notice under Section 9 (1) (e) of the Trade-marks Act, of the adoption and use by The Town of Lunenburg of the mark shown above.

PANTONE COLOURS

Red	185
Green	347
Brown	483
Blue	3005
Black	

Circulated: _____

Document No:
Meeting: November 24, 2020 Council
Circulate To: Council, BR, DH's, KR, Dist's 1&2, LFD, JG-Audit Committee
File: Budget 2020/21

M E M O R A N D U M

TO: **TOWN COUNCIL**

FROM: **LISA DAGLEY, FINANCE DIRECTOR**

DATE: **NOVEMBER 16, 2020**

RE: **2020/21 CAPITAL AND OPERATING VARIANCE REPORT – TO SEPTEMBER 30, 2020.**

Please find enclosed the variance report to **September 30, 2020**. The period ending September 30th represents 50% (6 months) of the fiscal year. Town General expenditures are at 45%.

Index to Reports

Based on the year to date operations to September 30, 2020 staff were projecting an overall $25,000 deficit for the Town General operations in fiscal 2020/21 however any year-end balance can now be offset by the Safe Restart Funds.

The Town received $287,930 from the Safe Restart Fund on November 4th which is to be used to offset lost revenue and additional operational expenses related to Covid-19 during the balance of fiscal 2020/21 and possibly into fiscal 2021/22 as it is anticipated that the COVID-19 recovery will extend into next fiscal year. It is staff's understanding that the Department of Municipal Affairs and Housing (DMAH) are currently consulting with the Association of Municipal Administrators of Nova Scotia (AMANS) and the Nova Scotia Federation of Municipalities (NSFM) regarding the accountability framework and reporting requirements for the Safe Restart Funds, however those details are not available at this time.

Staff are recommending that the Safe Restart Funds be taken into operating revenue at this time. Staff will continue to monitor the revenue streams and operating costs that were estimated to be impacted by COVID-19 with updates provided in future variance reports. There is no recommendation for specific expenditures of these funds at this

time as there are still so many variables with this pandemic that could impact our operations and in turn our citizens and businesses.

Draft Motion:

Motion: moved _____, seconded _____ that the $287,930 of Safe Restart Funds be taken into operating revenues for fiscal 2020/21.

The Lunenburg Board of Trade has requested $1,000 for a Christmas holiday seasonal promotional grant. The Town's Electric Utility has the capacity within its advertising and promotions budget to provide this support for the LBOT.

Draft Motion:

Motion: moved _____, seconded _____ that Council approves the request of the LBOT for a $1,000 grant for Christmas holiday season lighting and other promotions from the Town's Electric Utility budget.

Acknowledged only by:

_____
Bea Renton, CAO

Encls.

Capital Status Report to September 30, 2020

Any comments in BOLD are changes from the previous report

TOWN	Project	Budget	YTD Actual	Under/(Over) Budget	DH
Buildings & Structures					
Annex					
	Annex Roof	$10,000		$10,000	PW
Comment:					
Due to COVID-19 pandemic work has been slow to progress at the School Annex, this monies was allocated for buying the materials for the roof and NSCC to install. NSCC will continue to work on the building finishing the front façade first then look to starting on the roof in the spring. A possibility that this will not be finished this fiscal year, in which case we will ask to carry the money forward.					
CN Station					
	CN Station - Capital Repairs including Garage Door & Siding	$15,000		$15,000	PW
Comment:					
The work was completed on November 10th.					
Lunenburg Academy					
	Lunenburg Academy Exterior Capital Repairs Phase II	$1,002,679	$367,560	$635,119	AM
Comment:					
Staff are anticipating substantial completion by the end of October. Project spans two fiscal years. Total budget $1,508,500. Amount spent in fiscal 19-20 = $505,821. The restoration of the mansard roof, towers, barreled dormers, cladding (including decorative bracket and dentils) and the accessible entranceway have been substantially completed. Roughly 50% of the pediments and cap tops (headers) have been restored. Roughly 75% of the window sash rehabilitation work has been completed and are currently being installed.					
Environmental Development					
	Comprehensive Community Plan	$229,300	$197,031	$32,269	DS
Comment:					
On Sept.22 Council passed a motion to accept the Comprehensive Community Plan and directed the consultants to prepare the draft Municipal Planning Strategy, Land Use Bylaw and Subdivision Bylaw.					
Equipment					
	Council IPad or Alternative	$10,000	$3,943	$6,057	KM
Comment:					
Received in September and have been issued to new Council.					
	Joint Building Inspection IT (Townsuite Mapping & Laser Fische Software Upgrades)	$10,000		$10,000	DS
Comment:					
Project progress slowed during spring/summer due to COVID-19.					
	CCP Capital Project	$10,000	$0	$10,000	DS
Comment:					
A project has not yet been identified.					

Capital Status Report to September 30, 2020

Any comments in BOLD are changes from the previous report

TOWN Project	Budget	YTD Actual	Under/(Over) Budget	DH
Public Works Infrastructure				
Wastewater Treatment Brook Street Storm/Sanitary separation infrastructure finalization	$185,000	$182,357	$2,643	PW
Comment: **Work was carried out in late August, early September. Project is now complete.**				
Wastewater Treatment Recycling Pump	$31,500	$27,636	$3,864	PW
Comment: Complete. This is a carry over item from fiscal 2019-20. The purchase was delayed because of Dorian flooding at the plant. Budget 19-20 = $31,500 funding from Gas Tax				
Wastewater Treatment Improve Treatment Process-Pre-Design	$270,000	$3,573	$266,427	PW
Comment: **Writing of RFP underway with report being prepared for Nov.24 Council meeting. Requesting extension to the March 31, 2021 funding deadline.**				
Wastewater Treatment Replace Lines and Diffusers in Aeration Tanks	$388,000	$333,491	$54,509	PW
Comment: **Work completed in June/July and the results are very encouraging. Significant improvement in the aeration process. Holdback paid out in October.**				
Wastewater Treatment Green St., Knickle Rd. (Storm Diversion)	$0		$0	PW
Comment: Budget was reallocated to Brook Street project, July 21, 2020 Council Meeting.				
Wastewater Treatment Upgrade Communication Systems to Pumping Stations	$20,000		$20,000	PW
Comment: Determining first steps of the communications study.				
Wastewater Treatment WWTP-Voltage Reading Monitor at Pumping	$7,000	$6,837	$163	PW
Comment: Completed				
Wastewater Treatment WWTP-Upgrade Rails and Catwalks in Aeration Building	$30,000		$30,000	PW
Comment: Staff obtaining quotes on metal versus fibreglass replacement.				
Wastewater Treatment Lift Stations Capital Pump Repairs	$55,000	$45,492	$9,508	PW
Comment: **There is one pump still left to complete the repairs on (Brook Street pump#1 discharge check valve).**				

Capital Status Report to September 30, 2020

Any comments in BOLD are changes from the previous report

TOWN	Project	Budget	YTD Actual	Under/(Over) Budget	DH
Wastewater Treatment	Check Valve Installation at WWTP	$10,000	$5,184	$4,816	PW
Comment: **Completed.**					
Wastewater Treatment	Raw Sludge Pumps (2)	$50,000		$50,000	PW
Comment: Process Engineering support determining correct sizing and quotes.					
Wastewater Treatment	Flowmeter Installation Program	$50,000		$50,000	PW
Comment: CBCL currently looking at software implementation that would provide flow indication on all but two stations, if successful. If it is not then physical meters will be installed at these locations. There are two stations that will require physical meters.					
Wastewater Treatment	Backflow Prevention Study for Lift Stations	$40,000	$23,228	$16,772	PW
Comment: Study is near completion. It will include recommendations on remedial action and indication of what reduction in salt water ingress reduction can be expected. This is critical information for the preliminary design process for the WWTP upgrade.					
Wastewater Treatment	Flood Study	$47,900	$44,186	$3,714	PW
Comment: Flood engineering portion is complete and 3D flood model is 90% complete. Final completion for 3D flood model in October 2020.					
Equipment-Trucks	Dump Truck	$187,192	$187,192	$0	PW
Comment: This is a carry over item from fiscal 2019-20. Tender awarded November 12, 2019, truck delivered July 2020. Funding is a capital borrowing.					
Renewals - Sidewalks/Curbs	Tannery Road Seawall-Final Stage and Beautification	$70,000	$25,067	$44,933	PW
Comment: Seawall work is ongoing by PW and approximately 75% complete. Work is being done on an as-available basis for the PW crew. BCAF is working on a reduced design scope and implementation plan based on 50% funding for Fall 2020 for the Beautification component.					
Renewals - Sidewalks/Curbs	Brook Street-Beautification Project	$20,000		$20,000	PW
Comment: **Received 50% of the funding requested from the province for the Beautification Grant, scope was reduced but the planting took place in October.**					

Capital Status Report to September 30, 2020

Any comments in BOLD are changes from the previous report

TOWN	Project	Budget	YTD Actual	Under/(Over) Budget	DH
New Sidewalks/Curbing	Tannery Road-Knickle Rd. to 97 Tannery Road (E) - Council asked staff to prepare a supplementary report regarding how Town Public Works staff can construct the sidewalk on a phased in basis if necessary.	$255,000		$255,000	PW
Comment: Report to layout costs and plan to do this as a PW self-executed project will be in front of Council fall 2020.					
Infrastructure	Streamed Waste Cans	$9,300	$0	$9,300	PW
Comment: Supplier to construct them.					
Fire Department	Pumper #2 Replacement	$755,100	$757,894	($2,794)	PW
Comment: Complete. Council approved overage of $2,794 surplus sale proceeds Sept.8/20					
Fire Department	Turnout Gear Washer	$5,400	$5,345	$55	GM
Comment: Complete.					
Fire Department	Turnout Gear Dryer	$9,700	$0	$9,700	GM
Comment: To be funded by Fire Dept.					
Fire Department	Floor Scrubber	$5,100	$4,644	$456	GM
Comment: Complete					
Fire Department	Aluminum Garbage Bin	$3,800	$3,583	$217	GM
Comment: Complete					
Community Centre/Arena	Community Centre-Bathroom Renovations	$6,263	$6,263	$0	KC/PW
Comment: Project is complete. This is carry forward balance item from fiscal 19-20. Total project budget was $55,000, spent in 19-20 was $47,230, however there were some stalls that required installation in April due to some covid delays. The $6,263 expended in 2020-21 brings the total completed project costs to $53,493.					
Community Centre/Arena	Arena-roof Exhaust Replacements	$10,000		$10,000	KC/PW
Comment: Purchase order issued for $5,042 + HST (Sept.4), project is underway and it is anticipated it will be completed before end of November.					

Capital Status Report to September 30, 2020

Any comments in BOLD are changes from the previous report

TOWN	Project	Budget	YTD Actual	Under/(Over) Budget	DH
Community Centre/Arena	Ice Resurfacer	$125,000		$125,000	KC
Comment: Tender awarded July 28, 2020 for $108,300 which included an edger. This item has been order and will be delivered in spring 2021.					
Community Centre/Arena	Ride on Mower	$25,000		$25,000	KC
Comment: Tender specs being reviewed.					

Capital Status Report to September 30, 2020

Any comments in **BOLD** are changes from the previous report

WATER UTILITY	Project	Budget	YTD Actual	Under/(Over) Budget	DH
General	New Services	$7,000	$888	$6,112	PW
Comment: As required.					
	Replacement Hydrants	$10,000	$0	$10,000	PW
Comment: As required.					
	Replacement Meters	$5,000	$0	$5,000	PW
Comment: As required.					
Distribution Mains	Water and Wastewater System & GIS Development (includes all underground infrastructure)	$50,000	$1,043	$48,957	PW
Comment: Consultant was engaged to submit funding application. Funding application submitted.					
Building Improvements & Construction	Chlorinator	$70,000	$0	$70,000	PW
Comment:					
	Road Improvement-Intake House	$10,000	$7,236	$2,764	PW
Comment: Completed					
	Pump House-Dares Lake Interior Steel Repair/Gutters	$4,000	$2,683	$1,317	PW
Comment: Completed					
	WTP-Paint and Reseal 2 Roof Vents	$7,500	$6,189	$1,311	PW
Comment: Budget was increased from $5,000 to $7,500 July 28. Work has been completed.					
	Geotechnical Investigation(Dam/Spillway)	$15,000	$0	$15,000	PW
Comment: Project awarded to Gemtec Engineering					

Capital Status Report to September 30, 2020

Any comments in **BOLD** are changes from the previous report

WATER UTILITY	Project	Budget	YTD Actual	Under/(Over) Budget	DH
	Downstream channel assessment, hydrologic/hydraulic modelling, field surveys	$17,500	$0	$17,500	PW
Comment: Project awarded to Gemtec Engineering					
	Design of Dam and downstream channel rehabilitation, approvals	$30,000	$0	$30,000	PW
Comment: Project awarded to Gemtec Engineering					
Furniture & Equipment					
	Half Ton Truck (1)	$25,000	$0	$25,000	PW
Comment: RFP returned higher than budget.					

Capital Status Report to September 30, 2020

Any comments in **BOLD** are changes from the previous report

ELECTRIC UTILITY Project	Budget	YTD Actual	Under/(Over) Budget	DH
Structures				
Capacitor Bank at Substation or Distribution	$480,000	$3,123	$476,877	LD
Comment: An Engineering Consultant has been engaged for the design of the distribution portion of this project. The distribution portion should achieve 70% of the benefit. The project is in the electrical design and scoping phase.				
Utility Line Work				
Meters	$15,000	$470	$14,530	LD
Comment: As required.				
Overhead Conductors	$125,000	$83,825	$41,175	LD
Comment: As required.				
Poles & Fixtures	$50,000	$36,786	$13,214	LD
Comment: As required.				
Services	$25,000	$19,063	$5,937	LD
Comment: As required.				
Street Lighting	$30,000	$2,500	$27,500	LD
Comment: As required.				
Transformers - Line	$70,000	$41,900	$28,100	LD
Comment: As required.				

Town of Lunenburg Operating Financial Statements
September 30, 2020
Summary Information
(YTD Pro-rated Budget = 50%)

TOWN GENERAL

Revenue	YTD Actual	Budget	YTD 50% %		Balance
Taxes	$6,023,190	$5,988,100	101%	1.	($35,090)
Grants In Lieu Of Taxes	-	240,900	0%	2.	240,900
Sale of Services	55,037	96,700	57%		41,663
Sale of Service Arena/Community Centre	65,757	249,700	26%	3.	183,943
Other Revenue/Own Sources	153,085	311,200	49%		158,115
Unconditional Transfers/Other Gov'ts	12,609	50,100	25%	4.	37,491
Conditional Transfers/Fed or Prov Gov'ts	700	1,700	41%		1,000
Conditional Transfers/Other Local Gov'ts	87,437	174,900	50%		87,463
	$6,397,815	$7,113,300	90%		$715,485
Expenditures					
General Government Services	$257,960	$508,850	51%	5.	$250,890
Protective Services	808,889	1,598,200	51%		789,311
Transportation Services	360,097	959,000	38%		598,903
Environmental Health Services	593,371	1,358,600	44%		765,229
Public Health Services - Cemetery	39,292	40,700	97%	6.	1,408
Environmental Development	230,104	451,200	51%		221,096
Recreation & Cultural Services	145,186	284,300	51%		139,114
Arena/Community Centre	204,214	504,000	41%		299,786
Fiscal Services	586,166	1,408,450	42%		822,284
	$3,225,279	$7,113,300	45%		$3,888,021
TOWN SURPLUS (DEFICIT) **	**$3,172,536**	**$ -**			

*****Please note expenditures occur over a 12 month period however the majority of revenue is received in two semi-annual tax billings. Revenue billed is at 90% and 45% of expenditures have occurred as of September 30, 2020.***

Legend:

1. Both the interim and final property and sewer tax bills have been issued.
2. Usually received from Province in December or January.
3. Arena revenues are seasonal, opened Oct.26
4. Only one quarterly equalization payment rec'd, next payment in September.
5. Section 71 Tax Exemptions paid for the year.
6. Cemetery operational expenditures are seasonal.

	YTD Actual	Budget	YTD 50% %		Balance
WATER UTILITY					
Revenue	$779,765	$1,646,500	47.4%	1.	$866,735
Expenditures	$611,857	$1,646,500	37.2%		$1,034,643
WATER SURPLUS (DEFICIT)	**$167,908**	**$ -**			

Legend:

1. Two quarterly billings issued. Next billing will be on December 31, 2020.

	YTD Actual	Budget	YTD 50% %		Balance
ELECTRIC UTILITY					
Revenue	$3,047,015	$6,840,500	44.5%	1.	$3,793,485
Expenditures	$2,872,854	$6,840,500	42.0%		$3,967,646
ELECTRIC SURPLUS (DEFICIT)	**$174,161**	**$ -**			

Legend:

1. Electric consumption billings are seasonal in nature.

TOWN OF LUNENBURG ADDITIONAL FINANCIAL INFORMATION
September 30, 2020

DEED TRANSFER TAX REPORT

	Budget	This Month (#)	This Month Amount	Year to Date (#)	Year to Date Amount	Variance to Budget
Revenue this year	$100,000	(7)	$19,824	(45)	$111,161	($11,161)
2019/20 Reserve Fund Balance	$498,573					

TAX AND SEWER CHARGES REPORT

OUTSTANDING PROPERTY & SEWER TAXES	Balance 31-Mar-20	2020/21 Tax Billings	Collected To Date	Balance
2019/20 Taxes & Sewer and Prior	299,850	-	162,696	137,154
2020/21 Tax & Sewer billings	(133,360)	5,889,643	5,054,701	701,582
	166,490	5,889,643	5,217,397	838,736
Interest				35,498
Total Outstanding 14.84%				874,234

PARKING METER REVENUE AND FINES

	Budget 2020/21	Actual to 30-Sep-20	Variance to Budget	% of Budget
Parking Meter Revenue	$50,000	$26,990	$23,010	53.98%
Parking Meter Fines	2,500	492	2,008	19.68%
Court Fines	3,500	1,100	2,400	31.43%
Total	$56,000	$28,582	$27,418	51.04%

Grants 2020/21		
Status update: September 30, 2020		
Account #01-2-19-5100	2020/21 Approved Grants	2020/21 Notes
Bluenose 100 Committee ***pre-approved Jan.28, 2020***	$5,000	Funds for the Bluenose 100 Committee of $5,000 in the 2020/21 fiscal year and $5,000 of in-kind Town Services for the 2021/22 fiscal year when the celebration events will take place.
Curl for a Cause	$125	Annual event which supports Fishermen's Memorial Hospital, no application but Town traditionally supports
Fishermen's Memorial Hospital - Golf Tournament	$100	Annual event which supports Fishermen's Memorial Hospital, no application but Town traditionally supports
Lunenburg Community Christmas Dinner	$115	The funds requested will cover the rental of the auditorium at the Town Fire Hall. ($100 + HST)
Lunenburg County Lifestyle Centre	$1,000	Requesting municipal sponsorship towards hosting the 2020 Canadian Tire Para Hockey Cup Championships from December 5 to December 12, 2020.
Lunenburg Dog Park	$1,000	The funds requested will be used to pay insurance costs and other yearly expenses. **In-kind** garbage collection.
Lunenburg Folk Harbour Society-Summer Concert Series	$2,500	This grant will assist in providing funding for the bandstand concerts that are held on 10 Sundays, starting on July 5th and ending on September 13th.
Lunenburg Folk Harbour Society-Sponsorship	$1,000	While the Lunenburg Folk Harbour Festival has been cancelled for August 2020, many of the Society's fixed costs of operation still remain, with significant loss in their traditional revenue. Revenue streams of ticket sales, sponsorships from local businesses, and rental opportunities have completely dried up, and yet they still have all of their operating and administrative costs to cover. Because of this, the Society is asking the Town of Lunenburg to consider supporting the Society during this time of need.
Lunenburg Grad Bursary	$500	Bursary will be issued to a graduating high school student.
Lunenburg and District Swimming Pool	$1,500	Support to operate and maintain their outdoor swimming pool. Even with Covid-19 restrictions they plan to provide jobs doing maintenance, renovation and repair of the pool and its facility.
Nova Scotia Sea School	$1,000	The Sea School is seeking funding to assist in the structural long term repair and modification of the expedition vessels Dorothea and Elizabeth Hall. These 30' wooden sailboats, are over 20 years old and require improvements outside of regular maintenance to ensure they are meeting Transport Canada's Safety Regulations as commercial passenger vessels.
Safe Communities Lunenburg County	$1,275	Designed to address a range of seniors' safety issues, to mitigate risk, to reduce incidences of elder abuse, and to foster effective helping relationships between seniors and police.
Society of St. Vincent de Paul	$1,000	Funds will be utilized for any individual of the Town of Lunenburg who demonstrates genuine need. The society assists individuals who need temporary help with basic needs.
VON-Lunenburg County	$2,000	To assist with expenses associated with providing transportation for seniors and those with medical concerns. The service provides drives for medical appointments, provides weekly drives for residents for dialysis, weekly transportation to run errands. The transportation program also is used to delivery frozen meals to residents of the Town. All grant money received from the Town of Lunenburg will be used to offset the cost of the transportation program offered for residents of the Town.
Approvals June 3, 2020	**$ 18,115**	
Approvals since June 3, 2020		
LCLC-Donation for PVEC Grad Event	$ 500	
Lunenburg Doc Fest	$ 1,000	
Updated 2020-21 Grant total	**$ 19,615**	
Total 2020-21 Budget	$ 20,000	
Budget for additional grant requests if required	**$ 385**	

Kelly Jardine

Importance: High

From: jamiemyra@eastlink.ca [mailto:jamiemyra@eastlink.ca]
Sent: November-16-20 6:39 PM
To: Bea Renton <brenton@explorelunenburg.ca>
Cc: Stan's Dad and Lad Shop Ltd. <stansdadandlad@eastlink.ca>
Subject: Christmas Festival Request 2020

Good Evening Bea,

Sorry for not getting back to you sooner but the week got away from me.

Can you put this request to Council ASAP for us as we would like to get the official announcement out by the middle of the week.

We are requesting that the Town sponsors this years "Light Up Lunenburg" event in the amount of $1,000.00. I will give the breakdown below.

Residential Christmas decorating contest:

- 1st. Place - $250.00 at a local restaurant
- 2nd. Place - $150.00 at a different local restaurant
- 3rd. Place - $100.00 at a different local restaurant
- $500.00 towards marketing initiatives to promote the contest.

The LBOT is planning to match whatever the town contributes.

If you need anything else please let me know.

Thanks again for all your help.

Jamie Myra
President LBOT

Update highlighted in yellow on page 2

#96. TOWN OF LUNENBURG PROCEDURAL POLICY

COUNCIL AND COMMITTEE MEETINGS AND PROCEEDINGS

PURPOSE

1. The procedural requirements in this Policy are intended to complement and supplement, and not to replace, the requirements contained in applicable municipal legislation, including but not limited to the Municipal Government Act ("MGA") with such amendments as may be made from time to time. This Policy also applies to Town Committee meetings with the relevant changes in wording.

DEFINITIONS

2. In this Policy, unless the context otherwise requires:

   (1) **"business day"** means a day when the Town Hall office is open for business;

   (2) **"Chair"** means the presiding officer of the Council or Committee;

   (3) **"Committee"** means a group of individuals appointed by the Lunenburg Town Council to serve on a body that makes recommendations by majority vote to Council. This includes sub-committees and advisory groups;

   (4) **"Council"** means the governing Council of the Town of Lunenburg;

   (5) **"Councillor"** includes the Mayor and all elected Councillors unless the context indicates otherwise;

   (6) **"Legislation"** includes Policies, Bylaws and other relevant Municipal, Provincial and Federal laws or approved documents recognized by Council.

   (7) **"Majority"** means more than one half of those present, unless the context indicates otherwise; and

   (8) **"Motion"** a formal proposal put to a Council or Committee by a mover and seconder decided by majority vote of Council or a Committee.

PROCEDURE

Time, Place, Date and Notice of Meetings

3. Unless otherwise specified pursuant to section 4, regular meetings of Council shall be held:

   (1) at the Lunenburg Town Hall;

(2) on the second and fourth Tuesday of every month except in the months of July, August and December when there is only one monthly meeting which shall be on the second Tuesday of those months unless notice is otherwise given; and

(3) commencing at ~~5:15~~ 6:00 p.m.

4. Regular meetings of Council may be rescheduled, relocated or cancelled:

(1) by motion or consensus of Council; or

(2) by the Clerk on behalf of the Mayor owing to unforeseen circumstances, provided the Mayor believes that the majority of Councillors would support such a step.

5. **Additional meetings** of Council may be convened in accordance with the MGA:

(1) by resolution or consensus of Council with advance notice being given;

(2) if the Mayor determines there is an emergency necessitating a meeting with such notice as is possible under the circumstances; or

(3) by the Clerk when required to do so by the Mayor or upon written request signed by a majority of Councillors.

6. Specific **notice** to Councillors need not be provided for:

(1) regular Council meetings held pursuant to section 3; or

(2) meetings held pursuant to subsection (1) of section 4 or subsection (1) of section 5 if the date was set at a Council meeting three or more days in advance;

but, subject to any statutory relaxation of notice requirements, two days' notice shall ordinarily be provided for other meetings to Councillors in the manner described in sections 7 and 8.

7. Subject to section 6, notice of meetings shall be provided verbally in person or by telephone or telephone message or by writing or by email to each Councillor. A Councillor may waive any deficiency in the notice provided to him or her for a Council meeting which he or she attends, and shall be deemed to waive any deficiency in notice to him or her for such meetings unless expressly objecting to the adequacy of the notice at such meeting.

8. Within thirty days following the first meeting of Council after a municipal election or by-election, each elected Councillor shall provide to the Clerk:

(1) a telephone number at which the Councillor ordinarily may be reached, with voice messaging capability with adequate capacity at all times to receive messages of one minute in length regarding Council meetings and Town business, and which the Councillor will regularly check for Town messages; and

(2) shall sign any documents required by the Clerk to use an email address on the Town's email system which the Councillor will regularly check.

The Councillor shall be deemed to have received any notice within one business day of it being distributed pursuant to this section.

9. Notice to the public is not required for regular meetings held under section 3, but subject to any statutory relaxation of notice requirements, two days' notice to the public should be provided for other Council meetings, except meetings considered to be urgent or emergencies, by the following options: posting at the Lunenburg Town Hall; social media; internet; print advertisement; signage; or such other means as determined by Council from time to time noting the time, date and place of the meeting.

Conduct of Meetings: General

10. The Mayor shall serve as the Chair of Council meetings. For Committee meetings, the Chair shall be determined in advance by Council when Committee appointments are made. It shall be the duty of the Chair or alternate as set out herein to:

    (1) open the meeting of Council by taking the chair and calling the Councillors to order if a **quorum** is present;

    (2) declare a meeting dissolved if no quorum has been achieved within fifteen minutes of the scheduled meeting time;

    (3) if the Mayor does not attend within fifteen minutes after the time appointed, the **Deputy Mayor** shall call the Councillors to order and if a quorum is present, shall preside over the meeting or until the arrival of the Mayor;

    (4) in case neither the Mayor nor the Deputy Mayor (or Committee Chair as applicable) is in attendance within fifteen minutes of the appointed time, the Clerk shall call the Councillors (or Committee members as applicable) to order if a quorum be present, and the Councillors shall choose a Chair who shall preside over the meeting or until the arrival of the Mayor or the Deputy Mayor;

    (5) if there is no quorum present within fifteen minutes after the time appointed for the meeting or a quorum is lost during a meeting, the Clerk shall take down the names of the Councillors then present and the Council meeting shall stand adjourned until the next regular Council meeting;

    (6) determine whether a quorum can still be achieved to conduct Council business if an interest is declared by a Council member(s) with reference to the **Municipal Conflict of Interest Act**;

    (7) receive and submit to Council **motions** properly presented by a Councillor;

    (8) put to a **vote** a question which is regularly moved and seconded or necessarily arising in the course of the proceedings and to announce the result of the vote;

    (9) preside over Councillors, when engaged in debate, within the rules of conduct of debate;

(10) enforce on all occasions, the observance of order and decorum, except with concurrence of Council to relax the rules;

(11) call by name any Councillor persisting in a breach of the rules of order of Council thereby ordering him or her to vacate the Council Chambers;

(12) inform the Council when necessary, or when referred to, on a point of order;

(13) permit the Chief Administrative Officer to speak on any point upon request pursuant to the MGA;

(14) permit relevant questions to be asked through the Chair of any official or employee of the Town, or any member of the public in attendance, to provide information to assist any Council debate; and

(15) adjourn the meeting when the business is concluded or, when an adjournment time has been set and approved by majority vote or consensus, when the adjournment time has been reached, except when it is extended by unanimous consent. Meetings should not exceed a maximum duration of three hours or 10:00 p.m. whichever occurs first,

(16) at which time they will be adjourned until the next meeting of Council.

11. At Council meetings, unless a majority consents to a different order for that meeting, **Council shall conduct business in the following order**:

(1) call to order;

(2) acknowledgement of Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People;

(3) approval of agenda, including additions or deletions;

(4) approval of minutes from the previous meeting;

(5) public hearings, presentations and questions;

(6) consideration of correspondence, petitions and proclamations;

(7) business arising from the minutes;

(8) consideration of committee recommendations, minutes, reports and notices of motions;

(9) new business;

(10) in camera business;

(11) in camera notices of motion and recommendations; and

(12) adjournment.

12. Five business days before a Council meeting, a Councillor or member of the public may request of the Mayor and Clerk to **add a Council agenda** item with relevant and sufficient particulars and supporting documentation which the Mayor shall in consultation with the Clerk determine to which Council or Committee meeting the agenda the item shall be added at the upcoming or a subsequent meeting(s).

13. (1) Alternatively, a Councillor may give **notice of motion to add an agenda item** at a Council meeting which shall be:

    a. be in writing;

    b. include the name of the mover;

    c. be received by the Clerk at a regular meeting of the Council; and

    d. be printed in full in the agenda for the next regular meeting and each successive meeting of the Council until considered or otherwise disposed of.

    (2) When a Councillor's motion has been called at two successive meetings of the Council and not proceeded with, it shall be deemed to have been withdrawn and be removed from the agenda unless the Council otherwise decides.

    (3) The mover may withdraw a notice of motion at any time prior to the commencement of debate thereon.

    (4) Council may waive notice of motion on a two-thirds vote of the Council members present and voting except for Policy and Bylaw matters.

    (5) A point of order or personal privilege may be introduced without written notice and without leave.

    (6) The following motions may be introduced without notice and without leave:

    a. a motion to adjourn;

    b. a motion to call for the question;

    c. a motion to refer;

    d. a motion to table or to defer to a day certain;

    e. an amendment to a motion;

    f. a motion to suspend a rule of procedure;

    g. a motion to convene in camera; or

    h. any other procedural motion.

14. The Mayor and Clerk shall confer on the Council **agenda content and format** before it is circulated a minimum two business days before the meeting if possible. The agenda will be accompanied with an **agenda package** containing meeting materials in the agenda sequence.

15. The Chair shall decide all questions of order or procedure subject to an **appeal** to the Council.

16. Every Councillor, prior to **speaking on any question or motion**, shall raise a hand and wait to be recognized by the Chair. When two or more Councillors raise their hands to speak, the Chair shall designate the Councillor who has the floor who, in the opinion of the Chair, first raised their hand.

17. No Councillor shall speak more than ten minutes upon any matter at one time, without the leave of the Chair.

18. During a meeting Council may **recess** for short periods or move to another place, without ending the meeting.

19. At regular meetings of Council, except when Council resolves to defer approval of minutes for a maximum of one additional meeting, the **minutes** of the last preceding regular meeting and subsequent special meetings shall be reviewed and after all necessary corrections and amendments have been made and the minutes approved, the approved minutes shall be entered in the minute book of the proceedings of Council and such entry shall conclusively constitute the minutes of Council.

20. The minutes shall be kept by the Clerk and shall:

    (1) record the time when any Councillor joins or leaves a meeting which is in progress;

    (2) contain all resolutions, decisions by consensus and motions, with the name of the movers and seconders except Committee meetings, and shall record the outcome of each vote; and

    (3) mention reports, petitions and other papers submitted to Council only by their respective titles, or a brief description of their contents, which may be attached in full to the minutes as determined relevant by the Clerk.

Conduct of Meetings: Motions and Voting

21. The Chair shall state every **question** properly presented to Council if no Councillor offers to speak, the Chair shall put the question, after which no Councillor shall be permitted to speak upon it.

22. The usual form of voting on any question shall be by the Chair calling for "yeas" and "nays", but any Councillor, before or after a voice vote can call for, and obtain through the Chair, a show of hands.

23. The Mayor and every Councillor who is present when a motion is put, shall vote thereon unless the Councillor has declared an interest in the motion. A failure to expressly signal a “yea” or “nay” or raise one’s hand shall be deemed to be a “nay” vote. A tie vote results in the motion being defeated.

24. A motion must be seconded and then repeated by the Chair or read aloud by the Clerk before it is debated. The Chair may direct that the motion be put in writing, repeated, displayed or read aloud by the Clerk before it is debated or voted on.

25. After reading of a motion by the Chair or Clerk, it shall be open for discussion. The motion is deemed to be in the possession of Council at this time.

26. A motion which has been seconded and stated by the Chair may at any time before the Council has voted on it be **withdrawn** by the mover with the unanimous consent of Council.

27. When any question is before the Council, the only motions in order shall be:

    (1) a motion to amend the original motion;

    (2) a motion to refer the question, including the motion and amendment if one is moved, to any Committee;

    (3) a motion to defer the consideration of the question either indefinitely or to a specified time;

    (4) a motion to close the debate at a specified time; and

    (5) a motion that the question be put to a vote.

28. A motion

    (1) that the debate be closed at a specified time; or

    (2) that the question be put to a vote,

    shall be put to a vote without further amendment or debate, but a motion that the question be put to a vote shall not be in order until every Councillor who has not spoken on the question and claims a right to speak has been heard.

29. When the question before Council contains two or more distinct propositions upon request of any Councillor a vote upon each proposition may be taken separately in such order as determined by the Chair.

30. After a question is finally put by the Chair, no Councillor shall speak to the question nor shall any other motion be made until after the result of the vote has been declared.

31. Whenever the Chair is of the opinion that a motion is out of order, or contrary to legislation, the Chair shall immediately advise the Councillors thereof. If there is no appeal to Council, or if the Chair is sustained on an appeal, the question shall not be put.

32. A motion to adjourn shall always be in order except in the following cases:

    (1) when a Councillor is in possession of the floor;

    (2) when the "yeas" and "nays" are being called for a vote;

    (3) while Councillors are voting; or

    (4) when the adjournment was the last preceding motion.

33. The following questions shall be decided without debate:

    (1) all motions as to priority of business or as to the suspension of the order of the day;

    (2) a motion to allow any person other than Councillors to address Council;

    (3) a motion to postpone to a specified time or day;

    (4) a motion to lay on the table (suspend consideration of a pending motion); and

    (5) a motion to adjourn.

34. Only one **amendment** to the main motion may be pending at one time. As each amendment is voted on, subsequent amendments may be offered and voted on in succession.

35. (1) A motion to rescind shall not be made at the same meeting when the matter is decided, but may be put once at any subsequent meeting by giving prior notice of motion to rescind if the action or direction of Council has not already been completed.

    (2) A motion to rescind may be put by any Councillor regardless of how they voted on the original matter.

    (3) At a subsequent meeting of Council, the giver of such notice, or in that Councillor’s absence any other Councillor on the Councillor’s behalf, may put forward the motion of rescission.

    (4) A motion to rescind must be seconded.

    (5) A motion to rescind is debatable as to the merits of the question which is proposed to be rescinded.

    (6) A motion to rescind is amendable.

    (7) A motion to rescind shall be passed by a majority of the Councillors present and voting.

36. After any question or motion has been decided, either in the affirmative or negative, a Councillor who voted on the prevailing side may, after the decision has been announced by the Chair, but before adjournment of the meeting, give notice of an intention to move **reconsideration** of the motion approved at the same or next Council meeting. The giving of

such a notice operates as a stay or suspension of Council's decision, except in matters where there is great time sensitivity. Council then vote on whether the motion will be reconsidered at the current or next meeting. If the motion to reconsider is adopted, Council will reconsider and then re-vote on the original motion, possibly with a different outcome.

37. The following matters are not eligible for reconsideration:

    (1) a motion approving the first or second reading of a By-Law enactment, amendment or repeal;

    (2) a motion to decide upon a matter which was the subject of a statutory hearing by Council;

    (3) a matter that has already been reconsidered; and

    (4) a vote to reconsider.

38. Any **notice of motion** given by a Councillor for a subsequent meeting may, in the absence of the Councillor giving such notice, be taken up by any other Councillor.

39. All motions called in pursuance of the general order of the day and not disposed of shall be proceeded with and disposed of at the next meeting of Council.

Conduct of Meetings: Points of Order

40. It shall be the duty of the Chair, and the privilege of any Councillor, to call any Councillor to order, who violates any established rule or order. A point of order must be decided by the Chair before the subject under consideration is proceeded with.

41. When a Councillor is called to order, the Councillor shall remain silent until the point is determined or called upon by the Chair to be heard on the point of order.

42. A point of order is not debatable amongst other Councillors, unless the Chair invites discussion in an effort to assist in making a ruling. Where the Chair permits discussion of a point of order, no Councillor shall speak more than once without the leave of the Chair.

43. Decisions of the Chair on points of order, including an order expelling and excluding a person from the Council Chambers, are not debatable but are appealable to Council by any Councillor. When an appeal is made from the decision of the Chair, the Chair may briefly explain the basis for their ruling and shall then ask Council whether the appeal should be allowed and Council’s decision with reasons given shall be final.

44. No Councillor shall use offensive or unparliamentarily language or speak disrespectfully to or about anyone while in Council, or speak outside the parameters of the question in debate.

45. If a Councillor resists the rules of Council, obstructs the business of Council or disobeys the decision of the Chair, or of Council on appeal, on any question of order or practice or upon the interpretation of the rules of Council after being called to order by the Chair, or otherwise

disrupts the proceedings of Council, the Councillor may be ordered by the Chair to leave the Councillor's seat provided that a majority vote of Council shall be required to have the expulsion extended to additional meetings.

46. If the Councillor refuses to leave the Councillor's seat, the Chair may order the Councillor to be expelled from the Council Chambers. Such Councillor may, by vote of Council be permitted to resume their seat with or without conditions.

47. Persons who are not Councillors, officers or employees of the Town shall observe silence and order in the Council Chambers, unless given permission to speak by Council. Any such persons disturbing the proceedings of Council shall be called to order by the Chair and, if they fail to comply, shall be ordered, by the Chair to be expelled from the Council Chambers, provided that a majority vote of Council shall be required to have the expulsion extended to additional meetings. Such member of the public may, by vote of Council be permitted to re-enter Council Chambers with or without conditions.

48. An order of the Chair to expel a person from the Council Chambers pursuant to this part of the Policy constitutes a direction from the Town to leave the premises for purposes of the Protection of Property Act and other applicable laws.

Conduct of Meetings: Questions of Privilege, Parliamentary Inquiries, and Requests for Information

49. Any Councillor may raise a **question of privilege** relating to the rights of the Council as a whole or of individual Councillors, in which the former take precedence over the latter. A question of privilege must be disposed of before the matter under consideration is proceeded with.

50. Questions of privilege may relate to matters including: the comfort of Councillors with respect to heating, ventilation, lighting, noise, other disturbances, and anything which otherwise encumbers their ability to participate fully in Council proceedings; the conduct of officers, employees, and visitors; the accuracy of published reports of proceedings; or to any other such matters that may infringe upon the established rights of Council as a whole or of individual Councillors.

51. The Councillor raising a question of privilege shall either state the infringement on their privileges and request that the Chair remedy such infringement or make a motion addressing the question of privilege to the Council. The Chair will rule on whether the matter is a question of privilege to be immediately disposed of. Decisions of the Chair on questions of privilege are not debatable but are appealable to Council by any Councillor.

52. If the Chair rules in favour of a question of privilege or Council overrules a negative ruling by the Chair then the infringement will be dealt with or the motion regarding the question put before the Council for debate.

53. Once a question of privilege has been disposed of, the normal business of the Council shall be resumed at the point at which it was interrupted.

54. Any Councillor may make a parliamentary inquiry to the Chair to obtain information on a matter of parliamentary procedure or of the applicable legislation and motions bearing on the business at hand. It is the Chair's duty to answer such questions when it may assist the Councillor to make an appropriate motion, raise a proper point of order, or understand the parliamentary situation or the effect of a motion.

55. Any Councillor may make a request for information either to the Chair or through the Chair to another Councillor, employee, or other relevant person to obtain information relevant to the business at hand but not related to parliamentary procedure.

56. Any of the rules of order may be suspended in its operation by the unanimous consent of the Councillors present.

57. If any question arises that is not provided for by applicable legislation or the foregoing rules, it shall be decided by the Chair in accordance with the latest available version of Roberts Rules of Order.

58. Policy #88 Council Meeting Policy is hereby repealed.

Clerk' Annotation For Official Policy Book

Date of Notice to Council Members of Intent to Consider: April 28, 2020

Date of Passage of Current Policy: May 12, 2020

I certify that this Policy was adopted by Council as indicated above

_____ _____

Municipal Clerk Date