COUNCIL REPORT

REPORT DATE: October 7 , 2019
MEETING DATE: October 15, 2019

TO: Mayor and Councillors

FROM: Paul Nash, Liquid Waste Management Planning Project Coordinator

SUBJECT: Implementation Plan for Wastewater Upgrade Project

RECOMMENDATION

i. THAT Council receive the report Application to the "Implementation Plan for Wastewater Upgrade Project" report for information.

SUMMARY

In August 2019, Cumberland received confirmation that its application for $7.1M in federal and provincial funding had been successful. This allows Cumberland to proceed with the entire scope of the $9.7M wastewater upgrade project.

The proposed implementation of the project can be summarized as:

2019 – finalize funding details

2020 – procurement process and design

2021 – construction of lagoon upgrades – achieve permit compliance

2022 – construction of biochar reed bed and wetlands irrigation and enhancement

2023 – post completion optimization and environmental monitoring

This report outlines the proposed implementation plan for the project.

BACKGROUND

In September 2015 Cumberland decide to withdraw from the CVRD South Sewer project, to restart its own Liquid Waste Management Plan to identify a "made in Cumberland" solution to wastewater treatment. The LWMP restarted in March of 2016, and after two years of study and public process, it concluded in July 2018, with a plan for a comprehensive and innovative lagoon upgrade project that will meet Cumberland's current and future regulatory and capacity requirements, and deliver enhanced environmental performance.

The project was structured in two phases that could be done separately, or as a single project if sufficient funding is available, as shown in Table 1.

Table 1 Wastewater Upgrade Project Structure

	Phase 1	**Phase 1 & 2**
Project Components	Lagoon Upgrades to meet Permit	**Lagoon Upgrades to meet Permit**
		Additional upgrades to meet MWR requirements and additional population capacity
		Biochar media reed bed
		Wetlands Irrigation and Enhancement
Capital Cost	$5.6M	**$9.7M**
Population capacity	4500	**7000**
Dry weather flow capacity	1000 cu.m.day	**1800** cu.m.day
Achieves	Regulatory compliance	**Growth capacity, enhanced environmental performance**
	Population/flow capacity up to 2023-2025	**Population/Flow capacity up to 2040**

The Stage 2 LWMP report was submitted to the BC Ministry of Environment in July 2018. As of October 2019, Cumberland still has not received feedback on this report and the plan for meeting future regulatory requirements. Notwithstanding, Cumberland is still out of compliance with the current Permit and must implement improvements as soon as possible.

Public assent for borrowing up to $4.4M was received via referendum at the October 2018 municipal election. Combined with the $1.233M in reserves, this would allow Phase 1 to be implemented, if no outside grant funding was secured.

Two grant funding sources were pursued in 2018 and both have been confirmed for the project in 2019, allowing the complete scope of Phase 1 &2 to be implemented.

Project Components

The project consists of three main components; the lagoon upgrades, the biochar reed bed and the wetlands enhancement, as described in Table 2.

Table 2 –Project Components

Component	Activities	Approx. Costs
Lagoon Upgrades	• Headworks upgrade – add second screen • Lagoon de-sludging • Lagoon flow reconfiguration and aeration expansion • Chemically assisted solids separation and nutrient removal	$6.5M

	• Disinfection by Peracetic Acid • Amenities building (laboratory, control room, washroom, office, equipment storage, etc) • Chemical storage facility • Biosolids dewatering pad • Site upgrades – roads, electrical, fencing	
Biochar Media Reed Bed	Filtering of final (disinfected) effluent • Field trial 2019-2020 • Construction of main bed 1-1.5ha, likely to the north of lagoons • Construction 2021 or 2022	$0.85M
Wetlands enhancement	Use of water to restore wet conditions to adjacent drained wetlands • Biologist site assessment 2019-2020 • Decision on site in 2020 - north, east or both? • Ministry of Environment approval • Public involvement in design of enhancements • Construction 2022	$0.85M
Owners costs	• Project Manager, • Owners Engineer, • Procurement • Regulatory • Other	$1.5M

The estimated costs include an in-built contingency of 20% for each component. For the reed bed and wetland component, there is limited definition on the cost, and they were both budgeted with a placeholder of $1M total (85% contract cost and 15% owner cost). Since these components are not part of the regulated treatment process, there is not a strict performance requirement, and thus there is some flexibility in what is built and how it is used. The intention is to "build only as much as the budget allows". The reed bed is undergoing a field trial to assess performance and indicate costs, and the wetland enhancement project will need to be further defined, and will have public input into the functional aspects.

ANALYSIS/COURSE OF ACTION

Procurement Strategy

It is proposed to procure the three components (lagoon upgrades, reed bed and wetland) separately.

The lagoon upgrades are required as soon as possible in order to achieve regulatory compliance. They are also the largest cost component, and the one that is largely "conventional" wastewater design and construction. The reed bed and wetland are both unconventional components that

need further definition before being designed and neither can be used until the lagoon upgrades have been commissioned and "permit compliant effluent" is available.

For these reasons, it is planned to procure the three components separately, beginning with the lagoon upgrades.

The conceptual design of the project – the lagoon upgrades - has already been completed – and the task is now to do the detailed design and construction.

The proposed procurement process for the lagoon upgrades is to use a Design-Build process, instead of the traditional Design-Bid-Build process.

For this project, Design-Build has several advantages, as outlined in Table 3

Table 3 – Comparison of Procurement Models

Aspect	**Design-Build**	**Design-Bid-Build**
Owner involvement - Procurement	High	Low
Owner involvement - Detailed Design	Low	Moderate
Owner involvement - Construction	Low	Moderate
Control over end product	Moderate	High
Control over Cost	High	Moderate
Time to completion	Fastest	Slowest

A key feature of design-build is that the designer and builder are responsible for working out the details of "how to" and they decide between them the level of detail required for the design. In the case of the Cumberland project, which is essentially a retrofit, this has the advantage that the DB team has work out details of things like tie-ins to existing infrastructure. In a design-bid-build all these details must be investigated by the owner team, and designed to tender document detail, before the project can go out to bid.

In effect, in the D-B scenario, the proponents are betting on their ability to sort these details out as they go.

Overall, the Design-Build model makes the least demands on involvement for the owner, and the fastest delivery. The trade-off is that the owner does not have control over every last detail. It is therefore necessary to decide what details are actually important, and address and specify these in the Request for Proposals, and leave the other details to the Design-build team to sort out.

An experienced Project Manager is desirable for any project of this scale, but is essential for a Design Build process.

Timing

The project is expected to take four years for overall completion, as shown in Table 4, but the major milestone is the commissioning of the lagoon upgrades to bring Cumberland into compliance with the discharge Permit, and this is expected to be in Q3 of 2021.

Table 4 Project Timeline

Year	Activities
2019	Finalize funding agreements, commence biochar reed bed field trial
2020	Hire owners team – Project Manager, Owner's Engineer RFP process for lagoon upgrades; – define project scope and specifications, – geotechnical site investigation – issue RFP and select proponent Successful proponent begins work on design and pre-construction Conclude reed bed trial
2021	Major lagoon construction work Commissioning of lagoon upgrades for Q3 ***to achieve Permit compliance*** Design process for reed bed and wetland
2022	Procure, construct and commission reed bed and wetland components. Deadline for GMF Funding is Sep 2022
2023	Post construction optimization.
2026	Deadline for federal and provincial funding is March 2026

The primary funding driver is the three-year timeframe for the GMF funding. This is considered achievable, but there is not much scope for delay. If the project is completed by this time, then the federal deadline of 2026 will not be an issue.

FINANCIAL IMPLICATIONS

Funding for the project is combination of various federal and provincial grants, and contributions from Cumberland reserves, as outlined in Table 2.

Table 2 Wastewater Upgrade Funding Structure

Funding Components	Costs ($ Millions)
Project Scope	Phase 1&2
Project Cost	$9.7 million
Funding Sources	
Investing in Canada Infrastructure Program (ICIP), Federal Component	$3.898
Investing in Canada Infrastructure Program (ICIP), Provincial Component	$3.215
"Green Municipal Fund" (GMF) Loan	$2.250

"Green Municipal Fund" (GMF) Grant (15% of loan amount)	$0.337
Cumberland wastewater reserves	$0
Total Funding Sources	**$9.7 million**

The zero contribution from reserves is a change from the original financing structure, made possible by the different rules for the ICIP and GMF funding. ICIP requires the municipality to contribute 27% to the project, and GMF funds are considered to be municipal funds, and so can be used for the 27% municipal portion.

The grant funds are paid out on claims basis as the project proceeds, so Cumberland will still require short term financing to bridge the gap until the grant funds can be claimed.

OPERATIONAL IMPLICATIONS

The existing lagoon treatment system will continue to operate throughout the project with minimal interruption, and will require the continued attention of the operations staff.

The operations staff will also be involved in the planning of the project, but not the day to day construction activities.

STRATEGIC OBJECTIVE

Implementation of the wastewater upgrades will achieve Council's 2016 strategic objective of;

Developing an environmentally sustainable method of treating the liquid waste that is produced by the Village.

It also actions the LWMP Wastewater Advisory Committee's expanded objective of;

"Develop an environmentally sustainable method to treat the liquid waste that is produced by the Village, that is affordable, and, ideally, economically productive, environmentally enhancing and socially beneficial"

It is also advances the Official Community Plan policies for infrastructure of;

5.5.3 (2) Support opportunities for Federal, Provincial, and First Nation partnerships for infrastructure to manage costs and risk to the Village and tax payers.

And, (especially)

5.5.3 (5) Seek maximum funding for infrastructure development from senior levels of government by taking advantage of special financing opportunities available for innovative efficient infrastructure development.

CONCURRENCE

Michelle Mason, Financial Officer

Rob Crisfield, Manager of Operations

ATTACHMENTS

None

OPTIONS

1. THAT Council receive the Application to the "Implementation Plan for Wastewater Upgrade Project" report for information.
2. Any other action deemed appropriate by Council.

Respectfully submitted,

Paul Nash
Liquid Waste Management Planning Project Coordinator
Village of Cumberland

Tanalee Hesse
Interim Chief Administrative Officer