

DATE: September 3, 2020

TO: Chair and Directors
Comox Strathcona Waste Management Board

FROM: Russell Dyson
Chief Administrative Officer

RE: CVWMC Landfill Expansion Cell 2 Project

FILE: 5360-30/Cell 2

Supported by Russell Dyson
Chief Administrative Officer

R. Dyson

Purpose

To update the Comox Strathcona Waste Management (CSWM) Board (Board) on the timeline and regulatory steps necessary to begin the expansion of the Comox Valley Waste Management Centre (CVWMC) landfill to Cell 2.

Recommendation from the Chief Administrative Officer:

This report is provided for information only.

Executive Summary

- The CVWMC Cell 1 was constructed in 2016-2017 and is anticipated to reach capacity in 2023-2024.
- The operation of Cell 1 since 2017 has provided a better understanding of the amount of lead time required to transition operations between cells.
- The design and construction of Cell 2 should proceed to allow for placement of select waste in Cell 2 in 2022.
- A number of supporting projects will be integrated into the consulting engineer procurement of Cell 2 design for consistency and cost effectiveness.
- The design of Cell 2 has a budget of \$803,000 and was approved through the 2020-2024 Financial Plan in March 2020 – function 391.
- Capacity building for leachate treatment was not anticipated in the construction budget for Cell 2, options and cost estimates for leachate management solutions will be brought forward to the Board for consideration in 2021.
- An Operating Certificate (OC) amendment for the CVWMC is potentially necessary to support any changes to leachate management infrastructure, or the permitted effluent discharge rate.

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Background/Current Situation

Cell 1 of the landfill expansion at the CVWMC was constructed in 2016-2017 and had an estimated lifespan of six years under the status quo disposal rate. At the time that the 2017 CVWMC Masterplan was developed by AECOM, the disposal rate of waste going to the landfill was 0.57 tonnes per capita. Between 2014 and 2018 the CSWM achieved an average disposal rate of 0.54 tonnes per capita, slightly better than the status quo.

The first few truckloads of waste were placed in Cell 1 in August 2017 and consistent select waste placement began in March 2018 after commissioning of the Leachate Treatment Facility (LTF). Early projections for the life of Cell 1 were for capacity to be reached in approximately 2024 based on the date that filling began, and status quo disposal rate.

CSWM staff regularly monitor the airspace capacity and lifespan at both existing regional landfills; CVWMC Cell 1 and the Campbell River Waste Management Centre (CRWMC). Physical surveys are completed by McElhanney Engineering, and modelling of the waste received compared to projected waste tonnage is completed internally. The most recent update by GHD regarding the remaining airspace was provided in the 2019 annual reports for both facilities, and the Cell 1 Fill Plan CVWMC dated March 2, 2020. The following information was provided:

CSWM Facility	Remaining Capacity as of December 31, 2019	Estimated Timing to Capacity
CRWMC	91,500 m ³	Spring 2022
CVWMC - Cell 1	347,000 m ³	Late 2023

Transitioning from operating on the historical landfill to the fully lined Cell 1 in 2017-2018 was a learning experience for CSWM staff, as protection of the liner became a new pillar of operations. Protecting the 60mil high density polyethylene (HDPE) geomembrane liner and geosynthetic clay liner is a geotextile cloth overlain by 30 cm of drainage rock. Following guidance from the Landfill Criteria to further protect the liner, overtop of the drainage rock CSWM places a 2m thick layer of select waste or soft garbage and limits compaction to tracked vehicles only. This soft garbage is primarily limited to curbside collection loads that have been picked up from single family residents, and any homogenous loads that can be identified as safe by staff, such as fabric from mattress deconstruction or asphalt shingles. The volume of this waste is limited and has posed constraints on operations as they worked their way across the base of Cell 1, and along the sidewalls, as this protective layer is also necessary on the lined sides.

With this understanding, and anticipating the higher volumes of waste to be managed at the CVWMC with the closure of the CRWMC and transition of waste to Cumberland, CSWM staff are proceeding with the procurement for the design of Cell 2 to provide operations with sufficient time to place the select waste layer in Cell 2 prior to Cell 1 reaching capacity.

CSWM staff estimate that six months to one year will be needed to complete placement of select waste prior to use of Cell 2 for construction and demolition loads, or mixed waste loads. Working backwards from the conservative estimated lifespan of Cell 1 of late 2023, construction of Cell 2 will need to begin in 2021 and be completed by the end of summer 2022.

By diverting select waste to create the protective layer in Cell 2, the expected lifespan and capacity of Cell 1 could possibly extend into 2024. These values are forecasts based on the best available information at this time, and are adjusted on an annual basis to take into account variables such as population growth, tonnages received, settling of the waste, diversion of waste to Cell 2, and the timing of the waste transfer from the CRWMC.

A summary of key assumptions is below:

- Airspace consumption rate of 65,612 m³ from the CVWMC waste shed based on the November 2018 and November 2019 topographic surveys;
- Airspace consumption rate of 41,826 m³ at the CRWMC waste shed based on the average fill rate from 2016 to 2019 airspace consumption estimate; and
- In 2021, 30 per cent of the waste received at the CRWMC will be transferred to the CVWMC in the last six months of capacity, and then eventually 100 per cent in 2022.

The design of the Cell 2 expansion will be simplified by closely following the design criteria specified for Cell 1, and incorporating the requirements within our OC such as clause 1.2.5:

The base liner must include an upper primary HDPE double-sided textured geomembrane, and a lower secondary geosynthetic clay liner. In critical leachate collection and storage areas, including collection trenches and sumps, the base liner must also include an additional HDPE double-sided textured geomembrane immediately above the upper primary HDPE geomembrane.

There are a number of supporting projects that will be integrated into the consulting engineer procurement of Cell 2 design for consistency and cost effectiveness:

- Design of the landfill gas (LFG) collection piping from the LFG flare station to Cells 1 and 2
 - Collection of LFG in Cell 1 will begin in 2021 and design of the header must accommodate continued access to Cell 1 during Cell 2 construction
- Fill Plan for Cell 2
 - A supporting document to the Design and Closure Plan, the Fill Plan will also be necessary to support leachate modelling and the design of Cell 2
- Updated Design and Closure Plan, and Operations Plan for CVWMC
 - These plans were last updated in 2016 and with the closure of the historical landfill and introduction of Cell 2 these documents will require a revision to reflect current and future use of the site.
- Leachate Modelling
 - Leachate collected from Cell 2 will be sent to the LTF for processing before being returned back into the ground through the infiltration bed. The successful proponent will model the leachate to be generated from Cell 1 and 2 through the life of Cell 2 based on the Fill Plan, progressive closure schedule and water diversion efforts. They will identify if the existing infrastructure will be sufficient for the anticipated volume, and will make recommendations if additional infrastructure is recommended.

An OC amendment for the CVWMC is potentially necessary to support any recommended changes to leachate management infrastructure, or the permitted effluent discharge rate. When 100 per cent of the waste from the CRWMC is transferred in 2022 to the CVWMC, it will increase the amount of waste received from an average of 36,500 to 64,000 tonnes per year. The permitted amount of waste that the CVWMC can discharge under the OC is 65,000 tonnes per year. Diversion efforts of organics and construction and demolition materials will need to be increased to stay below our permitted amount.

Timeline and Next Steps	2020		2021				2022			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
RFP issuance for Design of Cell 2	■									
Design RFP Award		■								
50% Design of Cell 2			■							
Cell 2 Fill Plan			■							
Header Design				■						
Leachate Modelling				■						
Design and Closure Plan				■						
OC Amendment Submission (if required)				■						
90% Design of Cell 2				■						
Issue Construction RFQ				■						
Construction Award					■					
Construction Period					■	■	■	■		
Placement of Select Waste									■	■

Policy Analysis

The 2012 Solid Waste Management Plan (SWMP) for the CSWM commits to the disposal of residual solid waste within expansion landfills that meet the Ministry of Environment and Climate Change Strategy Landfill Criteria for new landfills including bottom liners, leachate systems, LFG systems, groundwater control systems and monitoring.

The CSWM continues to assess the feasibility of waste-to-energy technologies as an alternative to landfilling residual waste.

Options

This report is presented for information only.

Financial Factors

The design of Cell 2 has a budget of \$803,000 and was approved through the 2020-2024 Financial Plan in March 2020 – function 391. This project was identified as a critical capital project to move forward with to support the long term infrastructure needs of the entire CSWM region. This project was not included in any previous borrowing bylaws, and no authority to borrow has been given for this project through the SWMP nor a public approval process.

The construction of Cell 2 was also included in the 2020-2024 Financial Plan – function 391, and identified as an expenditure for 2021 in the amount of \$8,034,545 to be funded from the Capital Works Reserve Fund. Based on the above timeline, this expenditure is likely to be incurred over 2021 and 2022. It is expected that as the design works proceed this budget amount will be refined and staff will provide updates to the Board through the 2021-2025 financial planning process.

During the rainy season, peak leachate volumes have been higher than anticipated and have caused challenges for operations to manage with the existing constraints of the leachate treatment facility, discharge limits and storage capacity. Capacity building for leachate treatment was not anticipated in the budgeted amount of \$8 million for Cell 2. Options and cost estimates for leachate management solutions will be brought forward to the Board for consideration in 2021.

Legal Factors

The projects identified as part of this procurement will contribute to maintaining the CVWMC compliance status under our OC and support the operation of our regional facility in a manner which protects the environment.

Intergovernmental Factors

The area that Cell 2 is designed to be constructed is within several Village of Cumberland (Cumberland) Official Community Plan Development Permit Areas (DPA):

- DPA 1 Environmental Protection
- DPA 2 Groundwater Protection
- DPA 4 Wildfire Urban Interface
- DPA 5 Industrial

The CSWM facility is zoned by Cumberland as I-4 Refuse Industrial Zone, with a principal use of refuse disposal site, recycling facility and compost facility. Although our development of this land will be permitted under our operating certificate under the *Environmental Management Act* (EMA), and follow the principal use of the zoning, no exemption was identified for approvals under the EMA in the Official Community Plan. This project may be subject to approval of a Development Permit (DP) by Cumberland.

Recent delays in the approval of DP applications for much smaller projects at the CVWMC by Cumberland indicate that there is some risk to the timeline for approval of this more complex project.

Interdepartmental Involvement

This project is being led by the Engineering Services and supported by Financial and Corporate Services.

Citizen/Public Relations

For the design and engineering portion of the project no public engagement is anticipated to be undertaken. As we proceed to permitting and construction phases, public consultation may be required and a communications plan will be provided at that time.