November 2019

Langdale Wastewater Local Service Asset Management Plan

SUNSHINE COAST REGIONAL DISTRICT

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Version Log

This document was carefully prepared so that it can be maintained as a living document; a document that is continually edited and updated. Through the various edits and updates, this document may evolve and be expanded as needed. This may be as a result of infrastructure replacement or could be due to changes in regulatory requirements, technology, staffing, or environmental conditions. Regardless of the reason, updates to this asset management plan will be key to the ongoing operation of the Langdale wastewater local service.

Version	Revised By	Date	Description
1	D. Joseph	November 28, 2019	Final report for Board of Directors approval

Acknowledgements

Completion of this Asset Management Plan would not have been possible without contributions and support from the following staff:

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1. Local Service Information

Figure 1 – Map of Wastewater Local Service Area and Infrastructure

- Address: 42 Newman Road
- Original Construction: 1981
- Taken over by Sunshine Coast Regional District (SCRD): 1989
- Establishment of Local Service: 1996
- Major Upgrades: None to date
- Treatment System Owner: SCRD
- Number of Fronting Parcels: 40 Residential
- Number of Users: 40
- Treatment Process: Rotating biological contactor (RBC) (nonfunctioning)
- Treatment Permit #: PE-6209
- Permitted Discharge Amount: 54.6 m^3/day
- Regulatory Authority: Ministry of Environment Permit
- Effluent Receiving: Ground
- EOCP Classification: SWWS-M (Small Wastewater Systems – Mechanical)
- Statutory Right of Ways: BL269689 (registered August 1, 1997, for rear yard access to the collection system)

1.1. Development Details

The Langdale wastewater local service area is located in the West Howe Sound Electoral Area (Area F) of the SCRD. The treatment and disposal systems are located in a vacant parcel of land used exclusively for the processing of wastewater.

The community wastewater systems were constructed in 1981 to assist with the development of new single-family dwellings in the strata development. The parcels in this service area were identified as having insufficient land for constructing an onsite drainfield. The system was managed by the developer until 1989 when the SCRD began overseeing the service.

1.2. Established Bylaws

There have been various bylaws adopted by the SCRD Board of Directors that are relevant to the Langdale wastewater local service, as listed in Table 1.

Table 1 – Established Bylaws Pertaining to the Wastewater Local Service

Bylaw No.	Bylaw Name	Purpose
232A.4	Package Plants Service Unit (1994)	Established a designated area for the purpose of providing sewage collection, treatment and disposal within Areas A, B and E.
1026	Sewage Treatment Facilities Local Service (1996)	Converted the Package Plants Service Unit to a local service.
428.19	Sewage Treatment Facilities Service Unit (2019)	Establishment of, and subsequent updates thereto, sewage treatment facilities frontage and user charges.
512	Sewage Treatment Facilities Reserve Fund (2001)	Established a capital reserve fund for sewage treatment facilities.
608	Sewage Treatment Facilities Service Operating Reserve Fund (2007)	Established an operating reserve fund for sewage treatment facilities.

2. Description of Assets

The following sections outline the current state of the wastewater systems by providing answers to the following questions:

- What do we own?
- Where is it?
- What is its condition?
- What is its useful life?
- What is its value?

2.1. Treatment and Disposal Systems

The existing treatment and disposal systems have been decommissioned at the Langdale wastewater local service area. Currently the wastewater is being diverted to the treatment and disposal systems on the YMCA Camp Elphinstone property.

To date, there is no agreement in place between the SCRD and the YMCA for long-term shared use of the YMCA treatment plant. If an agreement cannot be reached between the two parties, a decision will need to be made whether the old treatment and disposal systems can be recommissioned or will need to be replaced.

2.2. Collection System

The collection system has approximately 815 m of 150 mm diameter, polyvinyl chloride (PVC) gravity mains, and ten manholes. The infrastructure depth varies between 0.60 m and 1.95 m below grade.

Approximately 350 m of the mains and five manholes are accessed through two Statutory Right of Ways. The first section extends from Newman Road through the rear yards of eight of the homes that front on YMCA Road (between Newman Road and Monroe Road). The second section extends from the south end of Jensen Road through the rear yards of seven homes that front Monroe Road and Jensen Road. All of those properties, and one additional neighbouring property, connect to the system through the rear right of ways.

2.3. Asset Accessibility

There are a couple of accessibility concerns regarding infrastructure maintenance and replacement.

- Entries to repair or service equipment in the old treatment plant are difficult due to buildup of gases. The structure should be demolished and hatches installed to improve pump accessibility.

- Access to the wastewater collection system in the Statutory Right of Way will require removal of the existing vegetation, including various bushes and trees. Cedar fences, and fence posts, will also need to be removed. From the 2018 aerial photograph, there may also be a conflict with the placement of sheds near the right of way.

2.4. Asset Condition

Wastewater treatment system condition was determined by staff based on several factors.

- Previous or immanent failure of the system;
- Frequency of system repairs;
- Age of system; and
- Ability to regularly meet effluent quality regulations.

Based on these factors each system in the local service area was assigned a condition rating from excellent to poor. An excellent condition is assigned to systems in near new condition, good to systems with few minor defects, fair to systems with moderate defects or signs of aging, and poor to systems that cannot currently function as designed, or will soon cease functioning without repair, due to flow volumes, defects, or aging.

The treatment plant is has failed and staff are exploring options for long-term wastewater treatment for the Langdale local service area. The treatment system is in poor condition.

Initially the wastewater from Langdale was diverted to YMCA Camp Elphinstone due to a failure of the drainfield. There was an effluent breakout (effluent rising to the surface due to an inability to drain through the perforated pipe) in the northwestern corner of the drainfield. A percolation test on other locations of the drainfield was conducted in 2019 to assess the condition of the rest of the perforated pipe (the test determines the water absorption rate at an exposed section of the pipe). While the drainfield it is now nearing its EUL and poses a concern for additional failure in the near future, the results of the percolation test revealed no issues with percolation on all four of the runs tested. The disposal system is in fair condition.

The condition of the collection system was assessed in 2018 through CCTV inspections. During the inspection two pipe segments were observed to have minor defects and three manholes observed to have moderate defects. The collection system is in good condition.

2.5. Asset Replacement Value

It is expected that, barring an agreement to have the wastewater permanently diverted to YMCA, the treatment system at Langdale will need to be replaced with a new process while the drainfield could be replaced with a field similar to the existing one. A replacement value was estimated based on the treatment and disposal systems at Roberts Creek Co-Housing wastewater local service area.

At Roberts Creek Co-Housing, wastewater enters the septic tanks where primary solids settle. Aeration occurs as aerated water is cascaded over honeycomb media. Effluent from the trickle filter is pumped through sand filters into the final clarifier before discharge to the drainfield.

The treatment process from Roberts Creek Co-Housing was chosen for determining a replacement cost for Langdale based on a similar number of users and it is a process that is commonly used in new development. A feasibility study should be completed by a professional engineer to determine the treatment and disposal process best suited for the conditions at Langdale wastewater local service.

Replacement value for the collection system was estimated based on individual component replacement values. Additional costs for the removal and replacement of bushes, trees, and the cedar fence that extends the length of the statutory right of way were factored into the replacement cost.

Table 2 – Asset Replacement Value Summary

Asset Type	Replacement Cost (2018 $)	Year Installed	Estimated Useful Life	Remaining Useful Life
Treatment System	$ 715,830	1981	50	12
Drainfield	$ 267,353	1981	40	2
Collection System	$ 493,460	1981	85	48

3. Operations and Maintenance (O&M) Plan

Operations and maintenance (O&M) are the activities that ensure the wastewater systems are able to continue to function as designed throughout their EUL. These activities include routine inspections and readings, unforeseen repairs, effluent sampling, and ongoing condition assessments. User fees and parcel taxes are collected annually to fund these activities.

As discussed in the Wastewater Service Review, the current fees and taxes are combined and can be used to fund the operational expenditures for the year. The recommendation in the Wastewater Service Review is for user fees to provide sufficient revenue for operational expenditures and for parcel taxes to be invested in capital renewal and replacement.

3.1. Current O&M Fees

The users of the Langdale wastewater local service are charged user fees of $562.50 per year (including a 25% increase in user fees in 2019) and those properties within the service area boundary as outlined in Bylaw No. 1026 are charged $102.00 in parcel tax per year (including a 2% parcel tax increase in 2019).

3.2. Current O&M Budget

The budgeted and actual expenditures of the Langdale wastewater local service from 2015 to 2018 are shown in Table 3. The breakdown between expenditure related to the collection system and the treatment and disposal systems has not been recorded. As there have been no recent issues identified with the collection system, all expenditures are assumed to have been allocated to the treatment and disposal systems.

Table 3 – Budgeted and Actual Operations and Maintenance Expenditures

Expenditures	2015	2016	2017	2018	Average
Budget	$ 23,814.00	$ 22,973.00	$ 21,561.00	$ 22,172.00	$ 22,630.00
Actual	$ 14,587.00	$ 13,921.00	$ 40,025.00	$ 21,159.98	$ 22,423.25
Variance	$ 9,227.00	$ 9,052.00	$(18,464.00)	$ 1,012.02	$ 206.75

Overall, the operations budget decreased by 7% between 2015 and 2018. The actual expenditure increased by 45% during the same period of time. The majority of the actual expenditure (57%) was to pay for staffing expenses of operational and administrative staff, while other significant expenditures include contracted services (30%) and equipment repairs and maintenance (10%).

The irregularity noted in this budget review, 2017, incurred costs in excess of the budgeted amount due to the cost of establishing an infrastructure connection between Langdale and YMCA Camp Elphinstone.

3.3. Potential O&M Budget

The potential O&M budget was created based on an optimal level of service for the systems at Langdale local service area. Similar to the existing O&M budget, staff wages account for the majority of the potential annual O&M budget for Langdale. The required weekly, monthly, and annual tasks are primarily completed by a Utility Technician.

Significant expenses in the budget include:

- Staffing expenses, consisting of:
  - O&M staffing requirement;
  - Administration of the wastewater system by Utilities Services staff;
  - SCRD Administration Services contribution;
- Annual and proportioned non-annual contracted services; and
- Proportioned share of service vehicles, tools, and miscellaneous expenses.

With the inclusion of all ancillary charges, the potential operating budget for Langdale wastewater local service is $40,080.00. The potential user fee for the 40 users in this local service area is $1,002.00, a 78% increase from 2019 rates. This increase is primarily attributed to the separation of property tax revenue from the operating budget and improving the level of service delivered to this local service area.

4. Capital Plan

Capital expenditure is required for the periodic renewal or replacement of wastewater systems or system components. A capital plan considers many of the topics already covered in this plan including asset replacement values and EULs, asset condition, and following a well-developed O&M plan.

The SCRD does not have a long-term capital funding plan in place for the wastewater infrastructure at Langdale.

4.1. Reserve Balances

As of the end of 2018, there was no investments in capital reserves and $33,786.27 contributed to operating reserves. Under the existing method of revenue collection and use, these reserves could be combined to invest in capital renewal or replacement projects if required.

There is currently no requirement for Langdale to have a set level, by either denomination or percentage, of reserves in place. Based on the current reserve balance and 2019 budget transfers, Langdale's reserves are 2% of the estimated replacement value of the infrastructure.

4.2. Potential Capital Budget

Budget models considering four different time frames (10, 20, 50, and 80 year periods) were prepared for consideration, each with varying impact on parcel tax and with different systems requiring replacement over the selected time frame. For each model two plans were prepared: a 10% parcel tax increase every five years, or a fixed parcel tax throughout the model time frame.

Each model factors in funding the full cost of the infrastructure requiring replacement within the life of the model. Any debt incurred during the timeframe of the model is paid off in full with interest and the model terminates with a reserve balance equal to 10% of the value of the infrastructure in the last year of the model.

The highlighted budget plans represent the model in which all infrastructure (i.e. the treatment, disposal, and collection systems) will all be replaced.

Table 4 – Potential Capital Budget Options Based on Model and Payment Method

Capital Budget	Model	Infrastructure Replaced	Payment Method	Total Revenue	Parcel Tax (Year 1)
Plan 1	80-Year	Treatment System (2) Drainfield (2) Collection System (1)	Even Annual Contribution	$ 13,458,800	$ 4,206
Plan 2	80-Year	Treatment System (2) Drainfield (2) Collection System (1)	10% Increase Every Five Years	$ 19,347,246	$ 2,691

Capital Budget	Model	Infrastructure Replaced	Payment Method	Total Revenue	Parcel Tax (Year 1)
Plan 3	50-Year	Treatment System (1) Drainfield (2) Collection System (1)	Even Annual Contribution	$ 6,002,000	$ 3,001
Plan 4	50-Year	Treatment System (1) Drainfield (2) Collection System (1)	10% Increase Every Five Years	$ 6,958,280	$ 2,183
Plan 5	20-Year	Treatment System (1) Drainfield (1) Collection System (0)	Even Annual Contribution	$ 1,823,900	$ 2,280
Plan 6	20-Year	Treatment System (1) Drainfield (1) Collection System (0)	10% Increase Every Five Years	$ 1,869,163	$ 2,014
Plan 7	10-Year	Treatment System (1) Drainfield (1) Collection System (0)	Even Annual Contribution	$ 1,492,050	$ 3,730
Plan 8	10-Year	Treatment System (1) Drainfield (1) Collection System (0)	10% Increase Every Five Years	$ 1,499,348	$ 3,570

In addition to the replacement of the wastewater systems, other items that appear in the capital budget include proportioned short-term debt payments for the replacement of two service vehicles.

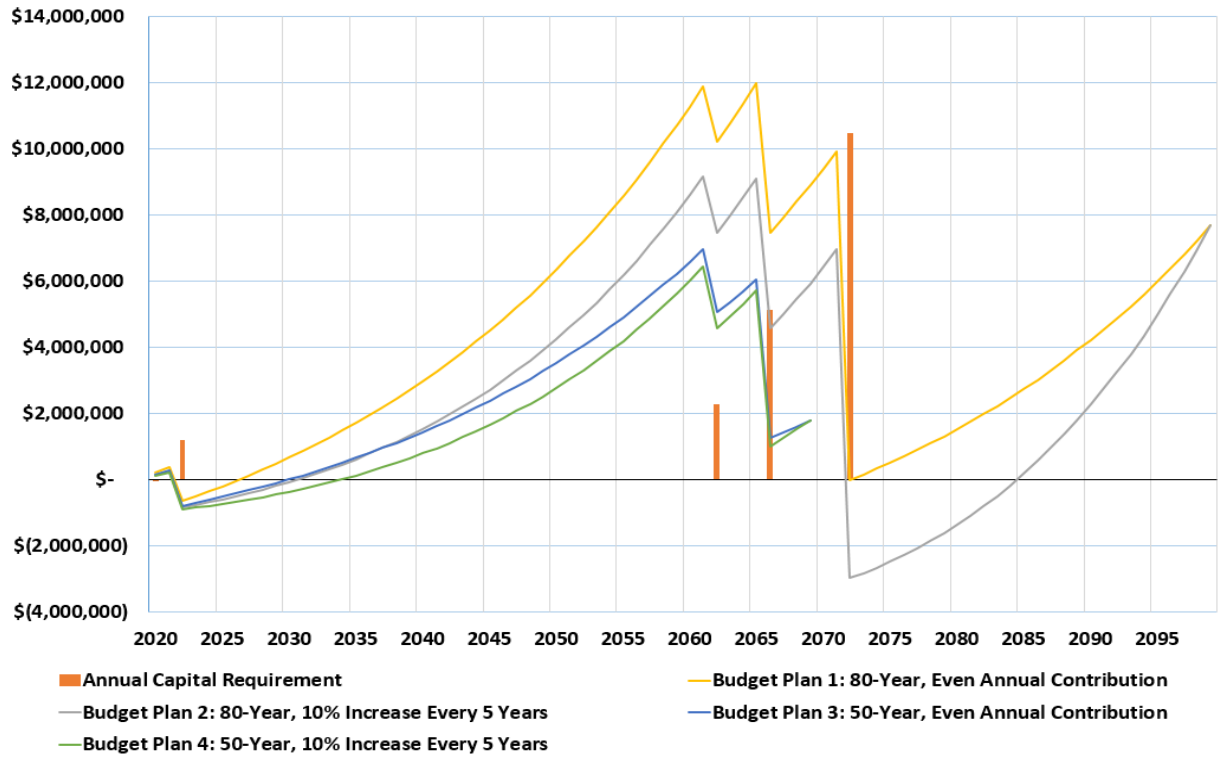

Figure 2 – Wastewater Local Service 50-Year and 80-Year Capital Plans

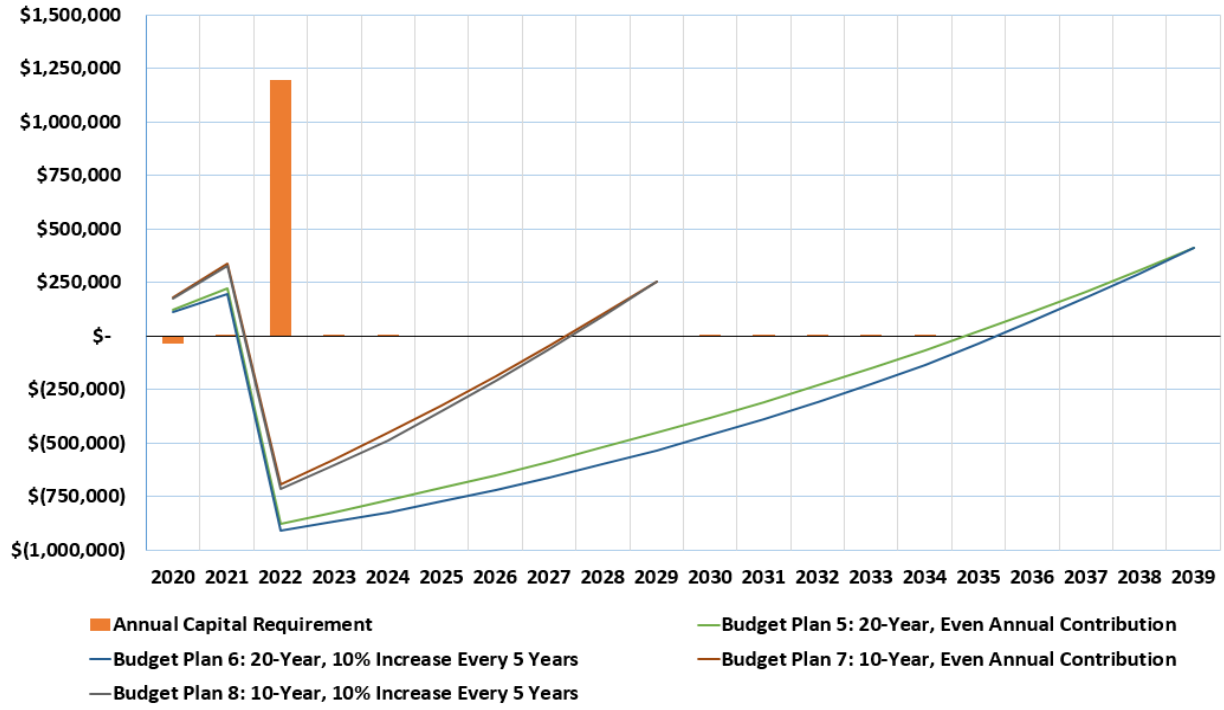

Figure 3 – Wastewater Local Service 10-Year and 20-Year Capital Plans

5. Additional Local Service Improvement Actions

Additional operational work is required in the Langdale wastewater local service area that falls outside of the typical operational and maintenance plan. These items have been listed due to the potential impact that they may have on the users and fronting properties of the local service.

Table 5 – Local Service Improvement Actions

Action Item	Target Year	Cost Estimate	Result
Investigate potential for an agreement with YMCA Camp Elphinstone regarding shared used of the treatment system and ocean outfall.	2019-2020	Dialogue with property owner required prior to cost estimate.	To be determined.
Secure a Statutory Right of Way for legal access onto YMCA Camp Elphinstone property.	2020	$ 1,300	To be determined.
Pending the outcome from dialogue with YMCA Camp Elphinstone, engage consulting services to complete a feasibility study on potential options for treatment system replacement.	2020	$ 10,000	To be determined.
Repair the moderate rated defects in the collection system noted in the CCTV inspection.	2021-2023	$ 6,000	To be determined.

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