REGIONAL DISTRICT OF CENTRAL OKANAGAN
GOVERNANCE AND SERVICES COMMITTEE MEETING
AGENDA

Thursday, May 9, 2019
8:30 a.m.
Woodhaven Board Room
1450 K.L.O. Road, Kelowna, BC

Pages

1. CALL TO ORDER

Chair Given acknowledged that this meeting is being held on the traditional territory of the Syilx/Okanagan Peoples.

2. ADDITION OF LATE ITEMS

3. ADOPTION OF THE AGENDA

Recommended Motion:
THAT the agenda be adopted.

4. ADOPTION OF MINUTES

4.1 Governance & Services Committee Meeting - April 11, 2019 — 1 - 6

Recommended Motion:
THAT the Governance & Services Committee meeting minutes of April 11, 2019 be adopted.

5. DELEGATIONS

5.1 Central Okanagan Search & Rescue - Update on Service Provided Within the Central Okanagan

Edward Henczel presenting a verbal update

Recommended Motion:
THAT the Central Okanagan Search & Rescue update be received for information.

6. CORPORATE SERVICES

6.1 Transfer Station Operations and Service Review 7 - 48

Recommended Motion:

THAT the Governance and Services Committee receive for information the Transfer Station Operations and Service Review report dated May 1, 2019;

AND FURTHER THAT the consultant's recommendations be considered as part the 2020 Financial Plan deliberations.

6.2 2019 Recycling Contamination Reduction Plan 49 - 59

Recommended Motion:

THAT the Governance and Services Committee receive for information the April 30, 2019 Recycling Contamination Reduction Plan For 2019 report.

7. ENGINEERING SERVICES

7.1 Electoral Area Water Rates Service Review 60 - 91

Recommended Motion:
THAT the Governance & Services Committee receive for information the water system fees and charges update for RDCO water systems; and recommends the Regional Board give consideration and approve Water System Fees & Charges Bylaws No. 1435, 1436, 1437, 1438, 1439 and 1440.

7.2 Central Okanagan East Sewer System Fee Review (Sunset Ranch) 92 - 119

Recommended Motion:
THAT the Governance & Services Committee receives for information the Central Okanagan East Sewer System Fees report, and recommends the Regional Board give consideration and approve Regional District of Central Okanagan Central Okanagan East Sewer Systems Amendment Bylaw No. 1441.

8. NEW BUSINESS

9. ADJOURN

Minutes of the ***GOVERNANCE & SERVICES COMMITTEE*** meeting of the Regional District of Central Okanagan held at Regional District Offices, 1450 KLO Road, Kelowna, BC on Thursday, April 11, 2019

Directors: J. Baker (District of Lake Country)
M. Bartyik (Central Okanagan East Electoral Area)
C. Basran (City of Kelowna)
W. Carson (Central Okanagan West Electoral Area)
G. Given (City of Kelowna)
C. Hodge (City of Kelowna)
S. Johnston (City of West Kelowna)
G. Milsom (City of West Kelowna)
L. Stack (City of Kelowna)
L. Wooldridge (City of Kelowna)

Absent: M. DeHart (City of Kelowna)
C. Fortin (District of Peachland)
B. Sieben (City of Kelowna)
T. Konek (Westbank First Nation)

Staff: B. Reardon, Chief Administrative Officer
T. Cashin, Director of Community Services
J. Foster, Manager of Communications
C. Griffiths, Director of Economic Development
D. Komaike, Director of Engineering Services
M. Kopp, Director of Parks Services
M. Drouin, Manager - Corporate Services (recording secretary)

1. CALL TO ORDER

Chair Given called the meeting to order at 8:35 a.m.

This meeting is being held on the traditional territory of the Syilx/Okanagan Peoples.

2. ADDITION OF LATE ITEMS

There are no late items for the agenda

3. ADOPTION OF THE AGENDA

#GS19/19 BAKER/WOOLDRIDGE

THAT the agenda be adopted.

CARRIED unanimously

4. ADOPTION OF MINUTES

4.1 Governance & Services Committee Meeting Minutes – March 14, 2019

#GS20/19 BAKER/MILSOM

THAT the Governance & Services Committee meeting minutes of March 14, 2019 be adopted.

CARRIED unanimously

5. DELEGATIONS

Director Basran arrived at 8:37 a.m. Director Carson arrived at 8:38 a.m.

5.1 Ministry of Transportation & Infrastructure - Steve Sirett, District Manager Re: Emergency Response Season

Steve Sirett addressed the Committee and outlined District 101 and what the Ministry is responsible for in the region.

- Highways department the largest of MOTI (four regions in the province).
- Central Okanagan is in the Southern Interior Region [Okanagan Shuswap District] (headquarters in Kamloops).
- Responsibilities were highlighted.
- Operations includes the maintenance of roads—staff working closely with the contractors – including emergency situations.
- Maintenance contracts are 10 year contracts. A new contract has been approved for Acciona Infrastructure Maintenance (AIM Roads) starting May 1st in the region.
- Safety and rehabilitation program outlined. Commercial Vehicle Safety and Enforcement – including an education component.
- Development approvals – MOTI is responsible for any land use decisions within 800m of highways (bylaws, Development Permits, Land Use Contracts, municipal subdivisions). Support the Provincial Approving Officer through processing and reporting on rural subdivisions. They are an independent statutory decision maker appointed by Provincial Order in Council. The decision of an Approving Officer is not to be fettered.

Questions and answer period followed the presentation.

#GS21/19 BAKER/BARTYIK

THAT the Governance & Services Committee receive for information the presentation--District 101--from Steve Sirett, District Manager, Minister of Transportation & Infrastructure.

CARRIED unanimously

5.2 Sustainable Transportation Partnership in the Central Okanagan (STPCO) Update (Jerry Dombowsky, Kelowna Transit and Programs Manager; Mariah VanZerr (Kelowna Strategic Transportation Planning Manager; and Stephen Power - HDR Consultant-Transportation Planner to present)

City of Kelowna staff and consultant addressed the Committee and provided an overview of the 2018 work plan.

The 2018-2020 work plan status was noted. Highlights for 2019 outlined.

- Operating ongoing functions
- Newsletters and communication coordination
- Regional transportation plan
- Looking at next phase of bike share program and how can it be regionalized
- Household travel survey results
- Okanagan gateway transportation study partnership Airport, UBCO, MOTI
- Evolution of STPCO to be further discussed

Regional Transportation Plan update

- Starting Phase 3 of the Plan (transportation scenarios)
- Consultant Stephen Power outlined the next phase
    - Strategy Development Process
    - 74% increase on the network (not all areas—ones that are congested).
    - In next 20 years, people will be living closer to transit hubs
    - Public and stakeholder input has been undertaken
    - Themes for strategy development outlined;
        - Transit (frequent service, higher order transit, shuttle services, 'last mile' connections)
        - Land Use Proximity/Density (concentration of activities and services, service or mobility hubs, land use policy)
        - Active Transportation (separated facilities, multi-modal trip support, connected networks, regional bike share, end of trip facilities)
        - Trip reduction/elimination (parking supply and pricing, co-working/telecommunity, regional development assessments)
        - Vehicle efficiency (focus on congested locations, managed lanes, pricing strategies, car share, ride hailing)
    - Common Issues need to be reviewed (connectivity between communities)
    - Policy, programs and partnership options for consideration

Public event scheduled for April 24th at UBCO – ½ day event for the public to engage in the ideas that have been developed to date. Results will combine with the Okanagan Gateway Transportation Study.

Question and answer period followed the presentation.

#GS22/19 BAKER/BASRAN

THAT the STPCO 2018 Year End Report and Transportation Plan update be received for information.

CARRIED unanimously

6. CORPORATE SERVICES

6.1 RDCO Board's Draft 2019-2022 Strategic Plan, Consultants: Neilson Strategies Inc. - Allan Neilson & Martin Bell

Consultants, Allan Neilson and Martin Bell presented a first draft of the priorities developed by the Board for the 2019-2022 Strategic Plan.

- Preliminary workshop and discussions have been put together to develop a draft strategic plan.
- Strategic priorities 'the buckets' were identified and outlined
  - Mobility
  - Sustainable living
  - Economic development
  - Environment
- What it means, how we measure success and what we will do.
- It was agreed to use the word 'diversified' housing instead of 'affordable housing'.
- 'Developing an economic forecast' – how are we resourcing this area – is the RDCO in the business to do that? RDCO provides a platform but don't have capacity or expertise in this area. Economic forecasting is not budgeted in the five year plan. Rephrase wording or remove completely.
- 'Watershed' ensure Okanagan Lake is included in the wording.
- No-where in the plan do we address the emergency plan. It should be recognized in the Plan. It is a regional function that leaves a strong 'play book' around the province.
- Should there be regional action plans for climate action? Are there targets the region should be meeting? Air, water is shared by all. Opportunity for collaboration between all partners/stakeholders. A lot of these issues belong in individual jurisdictions and are included in the Regional Growth Strategy. Need to be mindful of this issue-point of conversation going forward.

Director Johnston left the meeting at 10:45 a.m.

- Electoral area governance not included in the document.

The consultants will take into consideration the discussion today by the Committee and provide a further draft for consideration.

#GS23/19 BASRAN/HODGE

THAT the Governance & Services Committee receive the draft 2019-2022 Strategic Plan.

CARRIED unanimously

7. COMMUNITY SERVICES

7.1 Update on Secondary Suite Technical Stakeholder Review

Staff report dated April 11th outlined the technical stakeholder input received to date. Stakeholder engagement included Interior Health Authority and local on-site wastewater practitioners, and groundwater and hydrological experts. During the review it was identified additional density in the electoral areas may cause drainage and slope stability challenges particularly in areas without access to community sewer and without proper drainage plans.

It is recommended that the current rezoning process for secondary suites continue on a site-specific, case by case basis. In addition, regulations should be strengthened to ensure new and existing on-site sewerage systems demonstrate compliance with current standards. Furthermore that secondary suites be prohibited as a use under R1, RU4, RU5 and RU6 zones and the CR land use designation.

Staff outlined further recommended changes to regulations identified in their report noting that bylaw amendments would be required to come forward for Board consideration at a later date.

Question and answer period followed.

As septic systems continue to fail throughout the region, a question was raised whether a certain type of septic system can be mandated with an application for a secondary suite? No, septic systems are under the jurisdiction of Interior Health Authority. Concern was also raised regarding storm water drainage problems. The Province is responsible for drainage as they are for subdivision approvals.

#GS24/19 STACK/MILSOM

THAT the Governance and Services Committee receive for information the Secondary Suites Technical Stakeholder Review report from Planning Services dated April 11, 2019;

AND FURTHER THAT the Committee recommends the Regional Board direct staff to proceed with preparing bylaws to implement the proposed secondary suite regulations.

CARRIED unanimously

4. NEW BUSINESS

4.1 Q1 Highlights Video (for information)

Due to time constraints the Q1 video was not shown at this time.

5. ADJOURN

There being no further business the meeting was adjourned at 11:20 a.m.

CERTIFIED TO BE TRUE AND CORRECT

_____
G. Given (Chair)

_____
B. Reardon (Chief Administrative Officer)

Governance & Services Committee

TO: Governance and Services Committee

FROM: Jodie Foster
Manager – Corporate Communications

DATE: May 1, 2019

SUBJECT: Transfer Station Operations and Service Review

Purpose: To provide the Governance and Services Committee with an overview of the Transfer Station Operation and Service Review Study Report.

Executive Summary:

In early 2018, consultant Morrison Hershfield was hired to conduct an operations and service review of the North Westside Transfer Station and Trader's Cove Transfer Station. The work involved identifying opportunities to improve services at the facilities including feedback from a customer satisfaction survey at the transfer stations.

The consultant's recommendations are outlined in the following report and staff will address each of them during their presentation to the Committee.

RECOMMENDATION:

THAT the Governance and Services Committee receive for information the Transfer Station Operations and Service Review report dated May 1, 2019;

AND FURTHER THAT the consultant's recommendations be considered as part the 2020 Financial Plan deliberations.

Respectfully Submitted:

Jodie Foster

Jodie Foster
Manager-Corporate Communications

Approved for the Committee's Consideration

Brian Reardon, CAO

Prepared by: Cynthia Coates, Waste Reduction Facilitator

Implications of Recommendation:

Strategic Plan:	The implementation schedule for the Solid Waste Management Plan listed an item to conduct feasibility studies to review the overall services at transfer stations and potential improvements
Financial:	The implementation of the recommendation to make repairs at Trader's Cove Transfer Station will cost approximately $15,000 – 20,000 and will be considered in the 2020 budget cycle.

Background:

The RDCO has two waste and recycling transfer stations along Westside Road in Electoral Area West, the Traders Cove Transfer Station (TCTS) and North Westside Transfer Station (NWTS). Both transfer stations collect residential garbage/waste and yard waste, as well as various recyclable materials (paper and packaging) on behalf of Recycle BC.

Trader's Cove has approximately 266 users and North Westside has approximately 935 users. Operation of the sites is contracted to OK Environmental Waste Systems and includes hauling and bin rental for garbage and yard waste, as well as staffing of the sites. The cost of hauling recyclables is covered by Recycle BC.

Residential users at each facility are allowed two bags per week of garbage, up to 10 bags per week of yard waste and unlimited amounts of recyclable material. The North Westside Transfer Station also has an annual hazardous waste roundup, as well as two user pay, bulky item collection days.

Trader's Cove Transfer Station is currently open:

- Wed 6:30 am – 11:30 am
- Sun 9:00 am – 5:00 pm (Sun 9:00 am – 1:00 pm in the winter)

North Westside Transfer Station hours are:

- 8:00 am – 12:00 pm Mon, Wed, Sat and Sun

The Transfer Station Review from January 2018 – December 2018 had three components:

1. A customer satisfaction survey conducted at each site;
2. An exploration of on-site composting options for organics; and
3. A review of opportunities to improve facility services.

Customer Satisfaction Survey

An online and paper survey was conducted from June 26 – Sept 7, 2018 for users of both facilities. There were 194 responses, representing 16 per cent of all registered users.

Response rates were as follows:

Facility	No. of Respondents	% of Registered Users
Trader's Cove	94	35%
North Westside	100	11%

Survey Summary Results

89-90% of respondents are permanent residents and use the facility weekly or monthly.

Question	Trader's Cove	North Westside
Satisfaction with Hours	68%	58% (25% wanted longer hours and 17% more days of the week)
Line up short/adequate	98%	95%
Adequate items accepted	68% (remaining would like to also see Household Hazardous Waste and electronics accepted)	57% (remaining would like other, used oil or food waste)
Site operator helpful	98%	75%
Site clean	98%	95%
Site safety	93% site was safe	86%
Used Bulky Collection	N/A	59% (62% found service satisfactory)
Used Household Hazardous Waste Round Up	N/A	42%

Assessment of On-Site Composting System

A component of the review included assessing various on-site composting technologies to manage yard and food waste on site in order to further divert material from landfill and reduce current hauling costs. While a number of options were proposed, each would require electricity and water, which are not currently on site at either location. Additionally, a full cost analysis was not complete at this time to determine whether a good business case exists for implementing some of these technologies.

There was some but not high interest from survey responses for food waste collection (30% of NWTS users and 25% of TC users)

The following is a summary of composting options considered:

Technology	Costs per site	Advantages	Disadvantages
Earth Flow - custom built vessel	$67,000 - $80,000 capital with annual maintenance costs estimated at 3% of the capital costs.	▪ Low labour costs ▪ Automated processing ▪ Can process food and yard waste	▪ Not bear proof (but it could be with a higher cost) ▪ Shredding needed for woody items
Earth Flow - intermodal unit	$79,000 -$95,000 with annual maintenance costs estimated at 3% of the capital costs.	▪ Bear proof ▪ Increased odour management control ▪ Can process food and yard waste	▪ Shredding needed for woody items
Aerated static pile (ASP)	$10,000 - $50,000 per site, depending on design.	▪ Simple ▪ Works well if only yard waste is processed	▪ Shredding needed for woody items ▪ Not suited for food waste ▪ Require a bucket loader onsite. ▪ Labour intensive

Opportunities for Site Improvements: Trader's Cove

Morrison Hershfield recommended improvements to Trader's Cove including:

1. Level off the step in front of the yard waste drop off. This area currently has a small step that users have to step down and back from after dropping yard waste. Estimated cost for this improvement is $15,000-$20,000.
2. Create covered shelter for Recycle BC materials. There is a requirement under the RDCO's contract with Recycle BC to ensure fibre materials are protected from weather. Estimated cost for this improvement is $20,000
3. While 68% of users are satisfied with the hours, 32% would like to see additional hours. Estimated annual cost is $9,000-$14,000 (for every extra 4 hours added). This is based on current contract costs and assuming higher costs for weekends.

Opportunities for Site Improvements: North Westside

The following options were recommended for North Westside Transfer Station:

1. The primary issue identified at NWTS is with yard waste congestion during peak seasonal times.
2. To deal with site congestion during peak seasonal times for yard waste drop off, reconfigure the site to accommodate an additional yard waste bin (there is currently only one on site).
    a. Option 1: Reconfigure within existing site footprint – cost is approximately $10,000 for additional yard waste bin
    b. Option 2A:- Expand site to the west, new retaining wall and place two yard waste bins. Estimated cost $140,000 (+ or – 50%)
    c. Option 2B: Expand site to west, no retaining wall, place recycling bins to the west. Estimated cost $110,000 (+ or – 50%)
3. 42% of users felt the hours were somewhat inadequate to inadequate. Adding an additional 4 hours mid-week is an estimated $13,000/year and additional longer hours on weekends estimated to $20,000/year. This is based on current contract costs and assuming higher costs for weekends

Conclusion

The above recommendations have not been budgeted or approved in the 2019 Financial Plan, therefore will need to be considered as part of the 2020 budget process.

Staff will proceed with leveling the step in the yard waste area at Trader's Cove Transfer Station later this year as part of the 2019 Work Plan.

Attachment(s):

- Transfer Station Operations and Service Review – Study Report with Recommendations

MORRISON HERSHFIELD

FINAL REPORT

Transfer Station Operations and Service Review – Study Report with Recommendations

Kelowna, BC

Presented to:

Cynthia Coates
Regional District of Central Okanagan
1450 KLO Road, Kelowna, BC

Report No. 1800975.00 February 25, 2019

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APPENDICES

1. BACKGROUND AND SCOPE OF REVIEW

To service the residents of Trader's Cove and along Westside Road, north of Kelowna, the RDCO operates two transfer stations for recycling and garbage collection: the Trader's Cove Transfer Station (TCTS) and the North Westside Transfer Station (NWTS). Both transfer stations collect household waste/garbage, yard waste, and various recyclable materials such as packaging and printed paper (PPP) for Recycle BC. Refer to Table 1 for a list of materials collected at each of the transfer stations.

Only registered residents are allowed to drop off garbage and recyclables at these sites. Residents are allowed to drop-off up to two bags per household per week. The requirement for residents to be registered applies to the transfer stations at Trader's Cove and North Westside to enable the RDCO to charge the facility users. These two facilities serve 266 and 935 residents, respectively.

Table 1 Materials accepted at Trader's Cover and North Westside Transfer Stations

Material	Trader's Cove	North Westside
Household waste / garbage (up to 2 bags per household per week)	X	X
Yard Waste (maximum load of 250 kg - 10 bags or one pick-up load)	X	X
Household recyclables: paper, cardboard, mixed containers, plastic bags, glass, and Styrofoam	X	X
Metal		X
Mattresses, furniture		X (limited)[1]
Large appliances		X (limited)[1]
Household Hazardous Waste (HHW)		X (limited)[2]
Lead-acid batteries		
Clothing	X	X

[1] There is a Bulky Items Collection organized at NWTS twice a year. The following items are considered bulky waste: mattresses, box springs, furniture, major appliances, scrap metal, lawn mowers and other motorized parts, household and lawn furniture.

[2] There is a Hazardous Waste and Electronic Recycling Collection organized once per year at the NWTS. Facility users can drop-off HHW, electronic and electrical waste (e-waste), batteries, and lights and light fixtures.

Morrison Hershfield was engaged to conduct an operations and service review of the two transfer stations. The work involved developing and analyzing a customer satisfaction survey of facility users and identifying opportunities to improve facility services. This technical memorandum (memo) presents the findings and recommendations of improvements for both sites.

2. EXISTING FACILITIES

2.1 Trader's Cove Transfer Station

The TCTS is located just north of Kelowna at the intersection of Bear Lake Main and Westside Road. The site is owned by the RDCO. OK Environmental Waste Systems operates the site and hauls the garbage on behalf of the Regional District. The recycling area of the facility relating to PPP is operated on behalf of Recycle BC.

The TCTS is open on Wednesdays (6:30 am – 10:30 am) and Sundays (9:00 am – 1:00 pm) throughout the year with extended hours during the summer (Wednesday - 6:30 am – 11:30 am, and Sunday - 9:00 am – 5:00 pm). The facility is closed Christmas Day and New Year's Day. An operator staffs the site during opening hours.

In 2017, a total of 107 tonnes of garbage and 46 tonnes of yard waste were accepted at this site from registered users (266 in total). During 2017, the average quantity of garbage collected per month was 8.9 tonnes, with a peak of approximately 16 tonnes during January, 2017. During 2018, July was the peak month with 15 tonnes. During 2017, the monthly average for yard waste was 3.8 tonnes, with a peak month of 9 tonnes in May. In 2018, May was also the peak month at 6.3 tonnes. Based on this review, there appear to be seasonal fluctuations with waste dropped off at the transfer station.

Garbage and yard waste are transported to the Glenmore Landfill.

Figure 1 shows an overview of the site. Pictures of the site are included in Appendix A. There are two 40 yard roll-off bins located at the site: one for garbage and one for yard waste. There are two areas for PPP material drop-off into mega bags:

1. Located on the same side as the yard and garbage drop-off for mixed containers, paper and cardboard (Photo 1 in Appendix A).
2. Located along the fence on the same side as the attendant booth for Styrofoam (white, coloured), glass, plastic bags and overwrap, and other flexible packaging (OFP), as per Recycle BC definitions (Photo 8 in Appendix A).

Figure 1 Trader's Cove Transfer Station

No waste audits have been completed at this facility since 2013, where one load was audited. A total of 31% of divertible materials were found during this audit. The five largest categories of divertible materials (by percentage of sample) were:

- Yard waste (9%)
- Plastic Film (5%)
- Soil (4%)
- Mixed paper (2%)
- Scrap metal pipes, wire, white goods and empty paint cans (1%)

2.2 North Westside Transfer Station

The NWTS is located along the Sugarloaf Mountain/Whiteman Creek Forest Service Road, which is approximately 3.2 km past the fire hall on Udell Road in Killiney Beach. The facility is located approximately 45 km north of Kelowna. OK Environmental Waste Systems operates the site and hauls the garbage on behalf of the Regional District. The recycling area of the facility relating to PPP is operated on behalf of Recycle BC.

The site is open at 8:00 am – 12:00 noon on Mondays, Wednesdays, Saturdays and Sundays. An operator staffs the site during opening hours. The facility is closed on Christmas Day, Boxing Day and New Year's Day and Easter Sunday.

In 2017, a total of 237 tonnes of garbage and 150 tonnes of yard waste were accepted at this site from registered users (935 in total). During 2017, the average quantity of garbage collected per month was 19.7 tonnes, with a peak of approximately 24.6 tonnes during June, 2017. During 2018, July was the peak month with 30 tonnes. During 2017, the monthly average for yard waste was 12.5 tonnes, with a peak month of 21.5 tonnes in April. In 2018, April was also the peak month at 25.7 tonnes. Similar to the TCTS, there are seasonal fluctuations of waste and yard waste quantities dropped off at the transfer station.

Figure 2 shows an overview of the site. Pictures of the site are included in Appendix A. This facility has five 40 yard roll-off bins located onsite for:

1. PPP materials - Mixed fibres (cardboard/paper) and mixed containers (via two roll-off bins),
2. Garbage (via two roll-off bins),
3. Yard waste (via one roll-off bin).

Additional PPP materials, including Styrofoam (white, coloured), glass, plastic bags and overwrap, are collected in mega bags behind the garbage roll-off bins (north side of the bins). Other flexible packaging (e.g. stand up pouches, zipper lock bags, etc.) was added to the site January 1, 2019. A donation bin for clothing is located adjacent to the attendant booth (office).

Figure 2 North Westside Transfer Station Site Overview

Bulky item collection takes place once in the spring and once in the fall. During a week-long event, facility users can dispose of large household items for a minimal cost ($20 per truckload in 2018). Unwanted fridges and freezers are accepted at $15 per item, which covers Freon decommissioning. The bulky wastes are collected in 40 yard roll-off bins (metal separated from other bulky items). Bulky items are collected around the storage shed on the south side of the garbage drop-off area.

In 2017, facility users dropped off 11.6 tonnes of bulky waste and 8.8 tonnes of major appliances (as scrap metal) during the bulky item collection days. The collection can be managed by the existing facility attendant during the events. The RDCO has reported some space constraints during the events, but believes that they are being managed adequately.

Garbage, yard and bulky waste are transported to the Glenmore Landfill. Freon is removed from major appliances at the Glenmore landfill.

The hazardous waste and electronic recycling collection takes place once a year in July. Items accepted include household paint, flammable liquids, aerosols, pesticides, gasoline, liquid adhesives, undercoat and tars, pool and hot tub chemicals, batteries, electronics, computers, small appliances, light bulbs and fixtures. The collection does not accept propane tanks, used oil, other chemicals, or commercial HHW. A contractor (Battery Doctors) has one staff member onsite during the event and collects HHW with a 5 tonne truck. The contractor is responsible for ensuring only accepted materials are dropped off.

The RDCO has not analyzed the composition of waste collected at the NWTS, and there is no waste audit data available for this facility.

3. CUSTOMER SATISFACTION RESULTS

A customer satisfaction survey was developed to gauge general customer experience at the two facilities. The survey was conducted via the RDCO website during a three-month period (June 26 to September 7, 2018). Survey results were logged via Survey Monkey. Paper copies of the survey were provided at both transfer facilities during the same period, and residents were able to provide responses via mail. The survey was also available online to capture those residents who are unable to access the facilities (e.g. owners of seasonal homes). A total of 96 responses were mailed in and 98 were submitted via Survey Monkey.

The survey had a total of 194 respondents, representing approximately 16% of all registered users. The response rates are broken down by the respective facility in Table 2.

Table 2 Response Rates for the Customer Satisfaction Survey

Facility	No. of Respondents	% of Registered Users
Trader's Cove	94	35%
North Westside	100	11%

3.1 Profile of Respondents

Approximately 89% of respondents using Trader's Cove and 90% of respondents using North Westside drop off waste from their permanent homes. The majority of the remaining respondents drop off waste from their seasonal homes.

The majority of respondents (93% for Trader's Cove and 90% for North Westside) are regular facility users who visit the facility weekly or monthly. Approximately 6% of respondents only use the facility a few times a year, and the remaining respondents rarely use the facility or have never used the facility.

3.2 Overall Survey Results

The survey asked respondents to specify which types of materials they dropped off at the facility during their last visit. At Trader's Cove, 99% of respondents dropped off garbage, 94% dropped off recycling, and 70% dropped off yard waste. For the respondents of North Westside, 99% dropped of garbage, 94% dropped off recycling, and only 50% dropped off yard waste during their most recent visit.

The respondents had the opportunity to provide final comments in response to the following question: "Do you have any other comments or improvements to suggest for the transfer station?" More than half of all respondents offered comments (66% of the 194 responses). Comments were grouped into the following categories in order to determine whether there were any general trends or themes:

- Customer Service (e.g. helpfulness of transfer station attendant)
- Cleanliness and Organization (e.g. odours, tidiness, general site maintenance)
- Material Types (e.g. types of materials accepted or not accepted at the facility)
- Material Quantities (e.g. amount of garbage bags accepted per visit, number of bins available)
- Collection Services (e.g. hazardous waste and bulky waste round-up, curbside collection)
- Operation Hours (e.g. hours per day and days per week)
- Layout and Site Condition (e.g. site design, facility size, site road conditions, bin arrangement)
- Accessibility (e.g. location, signs, road conditions)
- Cost (e.g. user costs, seasonal home vs. permanent home costs)
- General (e.g. overall comments on the facility or waste management system)

Survey results for each facility are summarized in the sections below.

3.3 Trader's Cove Transfer Station

Approximately 59% of the Trader's Cove respondents provided additional comments or suggestions for improvement with their survey submission.

Table 3 summarizes the number of positive and negative comments provided for each category by users of the Trader's Cove Transfer Station. Based on the survey comments, the areas of highest priority for Trader's Cove are the types of materials accepted at the facility and the hours of operation.

Table 3 Summary of Survey Comments from Users of Trader's Cove

Response Categories	No. of Respondents	No. of Positive Responses	No. of Negative Responses*
Customer service	32	32	0
Cleanliness/organization	3	3	0
Material types	11	0	**11**
Material quantities	2	0	2
Collection services	4	1	3
Operation hours/days	10	0	**10**
Layout/site condition/size	4	0	4
Accessibility	1	0	1
Cost	1	0	1
General comments (system and facility)	9	9	0

* Red indicates high priority issues (i.e. more than 8 negative comments)
* Yellow indicates low priority issues (i.e. less than 8 negative comments)

Approximately 98% of respondents think that the site operator at the transfer station is helpful and the transfer station is kept tidy enough.

The majority of respondents (68%) have stated that the items accepted during opening hours are adequate for their needs. However, the remaining respondents have indicated that they would like an area to drop off reusable items (i.e. for a free store), and they would like the facility to accept additional materials, such as organics, hazardous waste, electronics, lightbulbs, batteries, oil, propane tanks, tires, scrap metal and construction waste. Particular interest was shown for hazardous waste and electronics/small appliances. There were 4 respondents that dislike the additional effort involved with sorting recyclables into various streams at the depot, as opposed to dropping off commingled recyclables.

Of the Trader's Cove respondents, 68% are satisfied with the current facility hours. Approximately 16% of respondents have requested that the facility be open more days per week, with multiple comments indicating a preference for Saturday. The remaining 16% would like the facility to increase the hours of operation on opening days.

There were 3 comments suggesting the Trader's Cove site should be expanded to reduce traffic congestion. However, the majority of respondents believe there is no issue with traffic flow, as 49% say the facility lineup is usually short and 49% say it is usually reasonable. Respondents appear to think that the existing signage is sufficient, with 74% thinking signage is clear and helpful, 22% thinking it is somewhat clear, and 4% not having an opinion on the subject.

The majority of users (93%) feel safe at the Trader's Cove facility, while the remaining feel that the site could be made more safe to users. Some specific safety concerns among users include the narrow vehicle lane that inhibits vehicles from passing and causes congestion, the placement of recycling bins that forces pedestrians to pass between cars, and the yard waste bins that are difficult to reach.

3.4 North Westside Transfer Station

Approximately 60% of the North Westside respondents provided additional comments or suggestions for improvement with their survey submission.

Table 4 summarizes the number of positive and negative comments provided for each category by users of the North Westside Transfer Station. The North Westside Transfer Station respondents had more suggestions for improvement of the facility in comparison to Trader's Cove. Based on the survey comments, the high priority categories for North Westside are the customer service, types and quantities of material accepted at the facility, hours of operation, layout of the site, and the collection services provided.

Table 4 Summary of Survey Comments from Users of North Westside

Response Categories	No. of Respondents	No. of Positive Responses	No. of Negative Responses
Customer service	21	12	**9**
Cleanliness/organization	8	6	2
Material types	9	0	**9**
Material quantities	9	0	**9**
Collection services	10	0	**10**
Operation hours/days	13	0	**13**
Layout/site condition/size	15	0	**15**
Accessibility	2	0	2
Cost	2	0	2
General comments (system and facility)	14	13	0
* Red indicates high priority issues (i.e. more than 8 negative comments) * Yellow indicates low priority issues (i.e. less than 8 negative comments)			

There is some concern regarding customer service at the transfer station, where customers have indicated that the attendant was unaccommodating. However, 75% of respondents

have stated that the site operator is helpful. Additionally, 95% of users think the Transfer Station is kept tidy enough.

Approximately 57% of respondents think the items accepted during opening hours are adequate for their needs, while 42% think they are not adequate. Respondents have indicated that they would like an area to drop off reusable items (e.g. suitable for a free store), and they would like the facility to accept additional materials, such as organics, hazardous waste, more plastic items, electronics, lightbulbs, batteries, oil, propane tanks, tires, scrap metal and construction waste. There were 3 comments that expressed interest in a year-round bulky waste drop off area for reusable items.

There were 6 comments indicating a need for increased number of bins for yard waste and cardboard, since the current bins are frequently at capacity. Additionally, 3 respondents would like an increase in the number of garbage bags permitted per visit.

Almost half (41%) of respondents have never used the bulky item collection system. Of those who have never used the system, 46% say they have not had the need, 19% say they did not know about it, 16% say it is too expensive, and 19% do not have an opinion on the subject. Approximately 30% of those using the bulky item collection system think the service is not adequate. Of those who think the system can be improved, 54% think items should be collected more frequently, 5% think more types of bulky materials should be collected, and 24% think the service cost should be reduced.

More than half (56%) of respondents have never used the hazardous waste and electronic roundup system. Of those who never used the system, 25% say they have not had the need, 56% say they did not know about it, and 19% do not have an opinion on the subject. Approximately 25% of those using the hazardous waste roundup system think the service is not adequate. Of those who think the system can be improved, 64% think items should be collected more frequently and 12% think more types of hazardous waste should be collected.

There were 5 comments indicating that users were unaware of the hazardous waste and electronic roundup system or the bulky waste collection program. They have requested that more information be provided regarding these services. Another 3 respondents would like to see the frequency of collection services increased for hazardous/electronic waste and bulky waste, specifically in the summer months for seasonal residents. One respondent emphasized the need to be able to drop off the garbage at other facilities, such as in Kelowna, so people do not have to make dedicated journeys to drop off garbage.

Regarding operation hours, 58% of North Westside respondents are satisfied with the current facility hours. However, 25% think the operation hours are only somewhat adequate, and would prefer longer hours on current operation days, specifically the addition of afternoon and evening hours. The remaining 17% think the operation hours are inadequate and would like the facility open more days of the week.

An area of high concern to the respondents is the layout and condition of the site, where negative comments for this category make up approximately 15% of the total comments received for North Westside Transfer Station. There were 4 respondents who have

experienced issues dropping off yard waste with a trailer and would like to adjust the layout so a trailer can be backed up beside the yard waste bins. There were 8 comments stating that the facility needs to be expanded in order to mitigate congestion around the disposal bins. Due to the location of the yard waste bins, users are unable to access other disposal bins when someone is unloading yard waste. Additionally, 3 respondents mentioned that the road near the recycling area is in bad condition and needs to be improved or paved.

Most respondents are satisfied with the transfer station lineup, where 42% say it is usually short and 53% say it is usually reasonable. The majority of respondents also think there is adequate signage at the transfer station, where only 3% find the signage confusing.

The majority of respondents (85%) feel safe at the facility, while the remaining feel that the site could be made more safe to users.

4. ASSESSMENT OF ON-SITE COMPOSTING SYSTEMS

The RDCO asked MH to review suitable technologies for processing yard (and potentially also food) waste at either TCTS, NWTS, or at both locations. The objectives with a small-scale compost is to provide a an effective and sustainable option to reduce current hauling costs and processing fees and produce a good quality compost for local use. Yard waste is currently sent to Glenmore Landfill, and food waste is disposed as residual waste at Glenmore Landfill.

An on-site compost would need to process yard and food waste quantities generated by users of these transfer stations. Table 5 presents the estimated feedstock quantities. The yard waste estimate is based on quantities sent to Glenmore. The food waste estimate is based on the waste audit data from Trader's Cover (2013), which showed a 30% food waste (including meat, Kleenex, paper towels, paper plates). A conservative capture rate of 60% was assumed.

Table 5 Estimated Organic Waste Available for On-site Composting

	Trader's Cove	North Westside
Yard waste kg per day	137	411
Food waste kg per day	42	113
Total Organics to process (kg per day)	**186**	**543**
Total Organics to process (Tonnes per year)	***65***	***191***

The following section provides a brief overview of on-site composting systems that may be suited for use at these facilities. Generally, an on-site compost solution will require electricity and access to water. Currently, it is our understanding that neither of the two facilities have these utilities.

There are numerous organics processing options that may be suited for the facilities (provided there is access to electricity).

Earth Flow System. The Earth Flow System is an automated in-vessel composting system designed for on-site composting. Mixing, aeration and moisture addition is automated; therefore, this system requires very little labour beyond loading and unloading. The earth flow system can either be placed in a custom vessel, a site-built concrete vessel with a variety of options for an enclosure, or in an intermodal stainless steel vessel with a greenhouse roof enclosure[1]. Each of these options require a biofilter to manage odours from the process.

The Earth Flow System requires space for the vessel and biofilter. For a custom-built vessel, the RDCO is likely to need a footprint of approximately 5 x 2 meters, and for the intermodal unit, a foot print of approximately 6 x 2.5 m.

In addition, a biofilter takes up approximately half of the footprint of the processing unit (i.e. the biofilter is likely to take up at least 1.5 x 3 m).

Aerated Static Pile. The simplest and most inexpensive option is to process organic waste in an aerated static pile. It is generally only appropriate for feedstocks, such as leaves and branches, and when there is an abundance of space available. Capital costs depend on whether a concrete pad is needed for the composting area and the level of aeration required.

Table 6 identifies costs per site for the three different composting options and their benefits and disadvantages.

Table 6 Costs, benefits and disadvantages of different composting options.

Technology	Costs per site	Advantages	Disadvantages
Earth Flow - custom built vessel	$67,000 - $80,000 capital with annual maintenance costs estimated at 3% of the capital costs.	▪ Low labour costs ▪ Automated processing ▪ Can process food and yard waste	▪ Not bear proof (but it can be at a higher cost) ▪ Shredding needed for woody items
Earth Flow - intermodal unit	$79,000 -$95,000 with annual maintenance costs	▪ Bear proof ▪ Increased odour management control	▪ Shredding needed for woody items
Aerated static pile (ASP)	$10,000 - $50,000 per site, depending on design.	▪ Simple ▪ Works well if only yard waste is processed	▪ Shredding needed for woody items ▪ Not suited for food waste ▪ Require a bucket loader onsite. ▪ Labour intensive

[1] https://compostingtechnology.com/earth-flow/

In summary, composting of yard and food waste can only take place at TCTS and NWTS if these sites have access to electricity (and preferably water) and a shredder. Due to space constraints, a composting unit and associated biofilter will be difficult to accommodate within the current footprint of TCTS; however, space may be sufficient at NWTS if the site layout is reconfigured. Accurate costs can only be developed when a reconfigured facility design has been finalized.

In the customer satisfaction survey, no specific questions were posed on whether users wanted composting onsite. In response to general comments on suggested improvements, there were only two comments (one for each of the transfer stations) that wanted the addition of onsite composting. The RDCO may not want to establish onsite compositing due to the likely high cost and the relatively low public interest.

5. OPPORTUNITIES TO IMPROVE FACILITY SERVICES

5.1 Traders Cove

Based on the review and customer satisfaction results, this facility appears to have an efficient layout and functions well. Generally, it has clear signage and operating staff on hand who are available to direct users to appropriate bins for waste placement. MH has only identified three areas for improvement.

Safety

The mega bags for PPP drop-off are on the opposite sides of the traffic flow through the site, and is an increased safety risk to users walking between the two areas. This was not flagged as a risk by the facility users, based on the customer satisfaction survey. Due to the sloped nature of the site, the drop-off area would need to be significantly reconfigured to provide drop-off areas for all accepted materials on the same side of the site and the high cost would be difficult to justify. Therefore, MH suggests the RDCO focus on managing the risk to users walking across the area where cars travel by use of signs and communication by the attendant onsite. The operator can enforce a policy that prevents facility users from using headphones while at site.

It is important to highlight that there was recently (during Fall 2018) an incident when a facility user sprained an ankle after dropping off yard waste. The injury was caused when the user stepped down from the retaining wall by the yard waste drop-off area (Figure 3 below shows the wall, which is made up of highway blocks). The paving below is sloped in relation to the retaining wall.

Figure 3 Hazardous retaining wall where user is required to step down from yard waste drop-off area.

MH recommends the RDCO ensures the area that residents use when dropping off yard waste is level. The current design makes the user “step up” to effectively offload materials into the bin. A level drop-off area leading up to the safety rails can be created by placing a lock block against the existing lock-block wall and filling the area to eliminate the step up and create a level drop-off area.

The RDCO may also want to consider extending the drop-off area along the entire lock-block wall (Figure 4) to allow sufficient space for two users to drop off yard waste side by side. A safety rail will be required to prevent users from stepping off the side (on the left side of the drop-off area). The estimated cost for this work is $15,000 - $20,000, depending on local access to lock-blocks and fill material and RDCO’s preference for paving (i.e. gravel only would be a cheaper option).

Figure 4 Recommended work to level ground by yard waste drop-off area shown in computer generated image

Opening Hours

TCTS is currently open Wednesdays (6:30 am to 10:30 am) and Sundays (9:00 am to 1:00 pm) throughout the year, with extended hours during the summer (Wednesdays, 6:30 am to 11:30 am and Sundays, 9:00 am to 5:00 pm). Of the customer satisfaction respondents, a total of 32% wanted either longer opening hours or more opening days. Multiple comments indicated a preference for opening on Saturdays. Based on current costs to operate this site, the additional annual operational costs are likely between $9,000 (assuming four additional hours mid-week) to $14,000 (if opening four hours on a Saturday, assuming 50% higher staffing costs on weekends).

Improvements to Drop-Off Area Using Mega Bags

Ideally, the collection of recyclables using mega bags should be covered from the elements. Recycle BC specifies in the depot statement of work that the contractor must ensure that PPP is adequately protected from rain, snow and other inclement weather.

The RDCO can improve protection from the elements by providing a wooden structure with a roof to cover the mega bag drop-off area (Figure 5). Given there are two separate areas using mega bags at TCTS and the site would need to be reconfigured significantly in order to provide the collection of all materials along one site of the site, MH suggests covering

only the mega bags where paper is collected. The cost for this type of pre-fabricated wooden structure is up to $20,000.

Figure 5 Wooden structure providing cover for recyclable drop-off into mega bags

5.2 North Westside Transfer Station

Based on the review and customer satisfaction results, this facility appears to be working well in managing garbage and recyclables; however, there is a need for increased capacity to receive yard waste.

The site appears well signed and has operating staff on hand who are available to direct users to appropriate bins for waste placement.

MH has identified three areas for improvement, which are described below.

Public Education

The RDCO has been providing bulky item collection and hazardous waste and electronic roundup services for many years. Many residents who use this facility are now aware of these services. The RDCO may need to reconsider methods used to communicate available services. There may be opportunities to piggyback on other RDCO communications, such as mailers, utility bills, billboards, etc. Residents would benefit from having the information in hard copy up to a month before the collection takes place.

Opening Hours

The site is currently open from 8:00 am to 12:00 noon on Mondays, Wednesdays, Saturdays and Sundays. A total of 42% of the customer satisfaction respondents believed that the

operation hours are only ‘somewhat adequate’ or ‘inadequate’. Respondents would prefer longer hours on current operation days, specifically the addition of afternoon and evening hours, and some would like the facility open more days of the week. Based on current costs to operate this site, the additional annual operational costs are estimated to be between $13,000 (assuming four additional hours mid-week) to $20,000 (if extending opening hours by four hours on the weekend, assuming 50% higher staffing costs at weekends). Extending the opening hours may also reduce onsite congestion that some residents have commented on during the survey process.

Improvements to Yard Waste Drop-Off Area

There is only one 40 cubic yard roll-off bin for yard waste, and this is often not sufficient according to both users and the operator of the facility. According to the operator, yard waste is hauled from the site to the Glenmore compost facility twice a week during peak season and biweekly during the low season.

The facility has experienced large quantities of incoming material, particularly following storms (involving lake debris, etc.). We recommend increasing the capacity to two bins for yard waste. Users have also reported limited space for vehicle movement, leading to increased congestion. Customer satisfaction respondents noted issues dropping off yard waste with a trailer and would like to adjust the layout so a trailer can be backed up beside the yard waste bins.

Option 1: Reconfiguring the Site within the Existing Footprint

The site currently has two 40 cubic yard roll-off bins next to each other for PPP materials: one for cardboard/paper and the other for mixed containers (Photo 15 in Appendix A). Option 1 proposes to maximize the space at the south end of the site (opposite the garbage disposal area) as follows:

- Convert the existing mixed container roll-off bin to a second yard waste bin (i.e. purchasing a new roll-off bin at an approximate cost of $10,000).
- Keep the existing cardboard/paper bin in the same location.
- Move the roll-off bin for mixed containers to the south end of the site against the fence.
- Move the existing recycling mega bags to the south end of the site against the fence.

We understand that this space at the south end of the site is currently only being used on a temporary basis for the annual bulky waste collection events. The RDCO will need to consider space requirements for the bulky waste in order to determine whether this collection can be placed elsewhere or whether the site could be reconfigured with the current design (with only one bin for yard waste) during the bulky collection event.

Option 2: Reconfiguring the Site with an Expanded Footprint

A more costly option is to expand the existing site footprint. There are two suitable options for an expansion, both involving using the area on the west side of the site entrance.

The capital estimates provided in this section are for budgeting and discussion purposes only. As the design progresses, the contingency amount will also become lower and it will be possible to consider ways of lowering the capital costs.

It should be noted that a detailed review of the tonnages handled at the transfer station was not completed as part of this study. An analysis of existing tonnages is recommend to determine the appropriate bin sizes and estimated haul frequency for any proposed option. This analysis should be completed before detailed design of any of the proposed options begins.

Option 2A: Establish Yard Waste Drop-Off in Area Adjacent to the Site Entrance

Yard waste drop-off can be provided at roll-off bins in a saw tooth arrangement before the user reaches the garbage drop-off as shown in Figure 6. The site expansion needs to allow sufficient space so the user can pull up beside the roll-off bins to unload materials.

The existing yard waste area can instead be used for recyclables drop-off and there should be sufficient space to have all types of recyclable streams on the same side to eliminate the need for foot traffic across the traffic flow.

Sugarloaf Mountain / Whiteman Creek Forest Service Road

Trailers will back up to service bins.

New Yard Waste Area (Approx. Clearing 225m²)

Residents can drop off yard waste at top of wall into bins below.

Office

Recycling

Recycling

Mega Bags

Garbage

Garbage

Shed

P:\2018\180097500--RDCO Transfer Station Operations\09. CAD\09. Sketches\Option 2A.dwg Plotted: by Warren Pare

MORRISON HERSHFIELD

1:250 0 2.5 7.5 12.5m

North Westside Transfer Station
Option 2A

SCALE 1:250

Dec 13, 2018

The high-level conceptual design and cost estimate includes the following costs:

- Site preparation (site grading, clearing, and grubbing).
- Surfacing, barriers and signs (compacted gravel over the entire extension consisting of a 300 mm thick sub-base and 150 mm thick gravel road base).
- Fencing.
- Two 40 cubic yard bins.
- Lock-block retaining wall to create saw tooth with space for two 40 cubic yard roll-off bins.
- Concrete pads for roll-off bins.
- Structural fill behind block walls.
- An allowance for traffic barriers and concrete curbing.

Engineering (geotechnical and structural assessments) is required to inform the detailed design.

The estimated cost for this work is $140,000, based on information available at this time. The cost estimate is considered a Class D preliminary cost estimate (± 50 %) and is based on the high-level conceptual base plan.

Option 2 B: Establish Recyclables Drop-Off area Adjacent to the Site Entrance

If the drop-off area for recyclables were placed adjacent to the site entrance, the yard waste drop-off can remain in its current location. The capacity can be doubled if one of the roll-off bins that currently provides drop-off for PPP materials takes yard waste. Refer to Figure 7 for a visual site plan showing Option 2A.

The drop-off area for recyclables needs to allow sufficient space so the user can pull up beside the roll-off bins to unload materials. The site footprint does not require as much expansion as Option 2 A described above. The expansion will need to accommodate the placement of two roll-off bins (side by side) for mixed containers and mixed fibres and an area for canvas bags.

P:\2018\180097500-RDCO Transfer Station Operations\09. CAD\09. Sketches\Option 2B.dwg Plotted: by Warren Pore

MORRISON HERSHFIELD

1:250 0 2.5 7.5 12.5m

North Westside Transfer Station
Option 2B

SCALE 1:250

Dec 18, 2018

The high level conceptual design and cost estimate includes the following costs:

- Site preparation (site grading, clearing, and grubbing).
- Surfacing, barriers and signs (compacted gravel over the entire extension consisting of a 300 mm thick sub-base and 150 mm thick gravel road base).
- Fencing.
- One 40 cubic yard roll-off bin for additional yard waste.
- Concrete pads for roll-off bins.
- Structural fill behind retaining walls.
- An allowance for traffic barriers and concrete curbing.
- Engineering (geotechnical and structural assessments is required to inform the detailed design).

The estimated cost for this work is $110,000, based on information available at this time. The cost estimate is considered a Class D preliminary cost estimate (± 50%) and is based on the high-level conceptual base plan.

Improvements to Drop-Off Area using Mega Bags

The RDCO may want to provide a simple wooden structure to cover the drop-off area with the mega bags (refer to Figure 5, as also proposed for Trader's Cove). As mentioned in Section 5.1., for Traders Cove improvement, Recycle BC specifies in the depot statement of work that the contractor must ensure PPP is adequately protected from rain, snow and other inclement weather. Due to space constraints at the current location, provision of a covered area is better suited if the RDCO wants to reconfigure the site as described in Option 2B, with the recyclables drop-off area adjacent to the site. The cost for this type of pre-fabricated wooden structure is in the range of $20,000-$30,000.

Material Management

When MH looked into the possibilities of rearranging the existing site plan, we noted an option to increase material management efficiency. Based on information from the operator, the approximate hauling frequency for cardboard/paper (mixed fibres) is approximately weekly throughout the year.

The RDCO can consider using a cardboard compactor, which could reduce hauling frequency from weekly to biweekly or every three weeks. Typically, a compactor bin can almost quadruple the amount of material hauled in one trip. A recycling compactor and bin typically costs approximately $50,000.

The RDCO should correspond with Recycle BC to make sure that any changes to the current bin system is acceptable to them.

Site Improvement

In a discussion with the operator[2], site drainage was brought up as an issue. Potholes frequently form across the site and annual regrading is necessary. Paving the site is likely to improve site operation and the cleanliness of site, reduce any ponding and simplifying snow removal.

6. NEXT STEPS

As described above, there are a number of opportunities to improve TCTS and NWTS. The key improvement identified for Trader's Cove is the step-up to the retaining wall, where facility users are required to step up and down from yard waste drop-off area. There is an imminent need to level the ground at this drop-off area, and MH recommends the RDCO address this hazard as soon as possible.

MH also identified a number of improvements for the North Westside Transfer Station. The most pressing issue at this facility is congestion, especially around the yard waste drop-off area. The current 40 cubic yard roll-off bin for yard waste is often not sufficient during peak drop-off times. MH has identified three options to address the issue that vary in capital investment. The option to rearrange the current layout is the lowest cost and may be a short-term option until a time when the site is expanded. MH identified two different options for a site expansion, either placing the yard waste or recyclables drop-offs at the area adjacent to the site entrance. Both of these options require significant capital investments of over $100,000. The RDCO will need to consider whether this capital investment is feasible given current budgeting restrictions. Should the RDCO choose to proceed with an expansion of the NWTS, MH would be pleased to provide facility planning and design support, if required.

The report also identifies some operational improvements to the facilities. Many customer satisfaction respondents wanted either longer opening hours or more opening days, and MH has identified the cost to extend the facility opening hours at both facilities. MH suggests the RDCO review the operational cost increases internally to determine whether increased operating hours can be supported.

[2] As per personal communication between Curtis Jung, Morrison Hershfield and RJ from OK Environmental on December 17, 2018.

APPENDIX A: Additional Photos of the Transfer Stations

Photos from Traders Cove TS:

Photo 1: Drop-off areas for yard waste and garbage

Photo 2 Drop-off bins for garbage

Photo 3 40 Cubic yard roll-off bins for Yard Waste and Garbage From Below

Photos 4, 5 and 6 Trip Hazard Noted at Yard Waste Drop-Off


Animal Waste
Fruit droppings


YARD WASTE ONLY
Grass clippings
Needles
Wood Chips
Leaves, bark, garden plants
NOT ACCEPTED:
Flower pots
Rocks
Kitchen Scraps
Stumps
Sod
No Commercial
VIOLATORS WILL BE
MAX. FINE
Bin is only to be used by residents from

Photo 7 Attendant Booth

Photo 8 PPP drop off by attendant booth

Photo 9 Clothing Donation Bins By Exit

Photos from North Westside TS

Photo Entrance for the Site

Photo 10 Drop-off bin 1 for garbage (40 cubic Yard Roll-Off Bin)

Photo 11 Drop-off bin 2 for garbage (40 cubic Yard Roll-Off Bin)

Photo 12 View of Both Drop-off bins for garbage

Photo 13 PPP Recycling Areas Below Garbage Drop-Off

Photo 14 PPP drop off Into Mega Bags Below Garbage Drop-Off

Photo 15 PPP drop off into Two 40 Cubic Yard Roll-Off Bins

Photo 16 Yard Waste Drop-Off Bin

Photo 17 Clothing Donation Bins Next to Attendant Booth

Photo 18 Storage Shed in Easte Corner of the Site

APPENDIX B: Implementation Schedule

Appendix B: Recommended Implementation Schedule for Improvements to the Trader's Cove and North Westside Transfer Stations

Aspect	Proposed Improvement	Priority Ranking *(Low to High)*
Trader's Cove		
Safety	1. Improve safety by reconfiguring the site and providing drop-off areas for all accepted materials on one side of the site	Low
	2. Improve safety by providing better signage and implementing a no-headphones policy onsite to reduce risk to facility users crossing vehicle lanes	High
	3. Improve design to allow a level drop-off at the yard waste area	High
Opening Hours	4. Improve service level by increasing the facility hours or the number of days the facility is open	Medium
North Westside		
Public Education	1. Increase public awareness of existing bulky item collection and hazardous waste and electronic roundup services	Medium
Opening Hours	2. Improve service level by increasing the facility hours or the number of days the facility is open	Medium
Improvements to Drop-Off Areas	3. Double the capacity for yard waste drop-off by reconfiguring the site without expanding the existing footprint	High
	4. If the existing footprint is insufficient, double the capacity for yard waste drop-off by reconfiguring the site with the expansion of the footprint	Medium
	5. If the site is reconfigured, improve recyclables drop-off area by providing a simple wooden structure to cover the mega bags	Low
Material Management	6. Reduce cardboard hauling frequency by using a compactor	High
Site Improvement	7. Improve site operation and cleanliness by paving	High

Governance & Services Committee

TO: Governance and Services Committee

FROM: Jodie Foster
Corporate Communications Manager

DATE: April 30, 2019

SUBJECT: Recycling Contamination Reduction Plan for 2019

Purpose: To provide an outline of plans to reduce recycling contamination in the curb-side recycling program across the region.

Executive Summary:

The Regional District of Central Okanagan and its member municipalities have been participating in Recycle BC's (formerly Multi Material BC) province-wide Printed Paper and Packing (PPP) recycling program since May 2014. New five-year agreements with Recycle BC were signed this past fall for residential curb-side pickup and depot recycling collection effective November 2018 until December 31, 2023.

In the 2018 agreements, Recycle BC continues to outline contamination levels to which collectors must adhere. Achieving the outlined contamination levels has become increasingly important due to tightening markets for the sale of recyclable materials. Producers and recycling collectors are now responding in an effort to reduce contamination. Through Recycle BC, contaminated loads of recyclable material may be subject to fines in the future.

Financial incentives are provided to offset the cost of the recycling program however we are obligated to ensure clean loads of recyclable materials. A plan to reduce recycling contamination has been developed for 2019 with a focus on non-PPP material, plastic bags and overwrap and is presented here for the Committee's information.

RECOMMENDATION:

THAT the Governance and Services Committee receive for information the April 30, 2019 Recycling Contamination Reduction Plan For 2019 report.

Respectfully Submitted:

Jodie Foster
Corporate Communications Manager

Approved for Committee's Consideration

Brian Reardon, CAO

Implications of Recommendation:

Strategic Plan:	The Solid Waste Management Plan includes the principle "Prevent recyclables from going into the garbage wherever practical" and the strategy includes "Increase public awareness of existing recycling opportunities"
Organizational:	The RDCO delivers solid waste education, service administration, contamination reduction programming and overall support to the member municipalities.
Financial:	The 2019 budget for Solid Waste Management (cost centre 094) includes a budget item of $30,000 to address recycling communication and education, plus a further $80,000 for communication and education for all solid waste programs. For further detail on the recycling revenue and service level failure fines see the Financial Considerations section below.

Background:

In 2010, the provincial government added Printed Paper and Packaging (PPP) to its Recycling Regulation triggering industry to become responsible for PPP being produced and sent into the BC market. As a result, Recycle BC (formerly Multi Material BC) was formed to represent industry and develop a plan to meet their obligation under the recycling regulation.

Recycle BC offered non-negotiable agreements to local governments to collect residential recycling in return for financial incentives per household for collection.

- The RDCO and its member municipalities each signed individual agreements with Recycle BC to perform this service. The incentives go directly to the RDCO and the member municipalities. The most recent agreements were updated and signed for a five-year period from November 2018 to December 2023. In the Central Okanagan residential recycling is collected as part of the overarching automated curbside cart waste collection system including weekly garbage collection and biweekly recycling and yard waste collection.

- The RDCO also receives education and service administration top up incentives from Recycle BC and provides region-wide education, service administration, contamination reduction programming and overall support to the member municipalities.

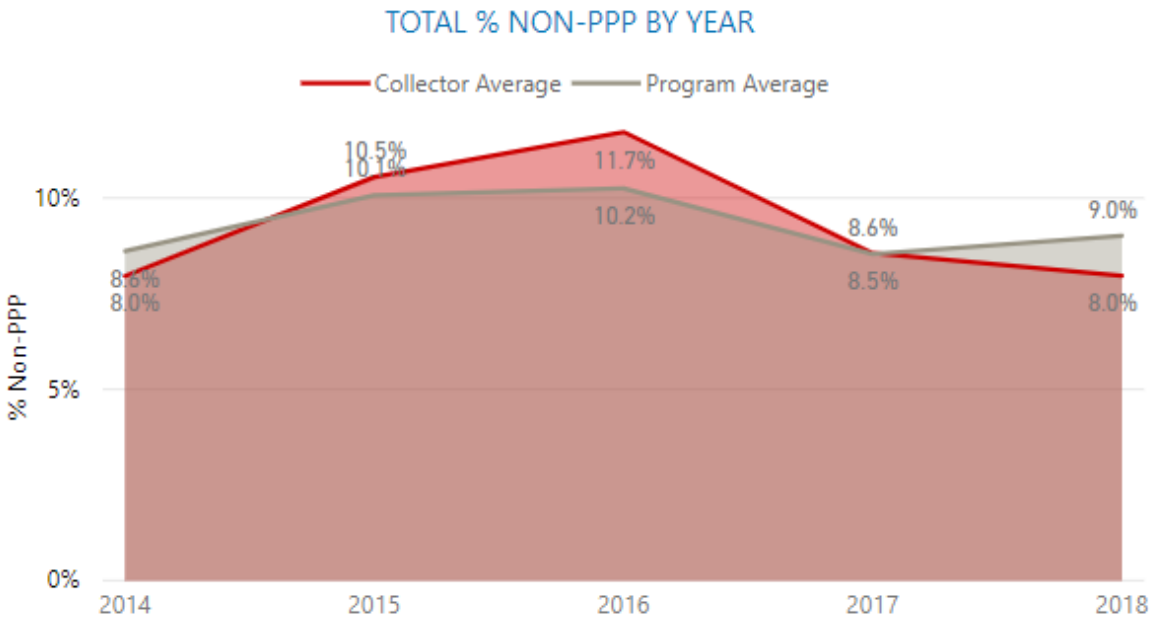
- Lastly, Recycle BC provides incentives to the RDCO for depot operations for the two regional depots (Westside Transfer Station and Glenmore Landfill) as well as two transfer stations with recycling depots in Electoral Area West (Trader's Cove and North Westside Transfer Station).

In the 2018 agreements, Recycle BC continues to outline contamination levels to which collectors must adhere. Achieving the outlined contamination levels has become increasingly more important due to tightening markets for the sale of recyclable materials. Producers and recycling collectors are now responding in an effort to reduce contamination. Through Recycle BC, contaminated loads of recyclable material can be fined. More information is provided in the financial considerations section below.

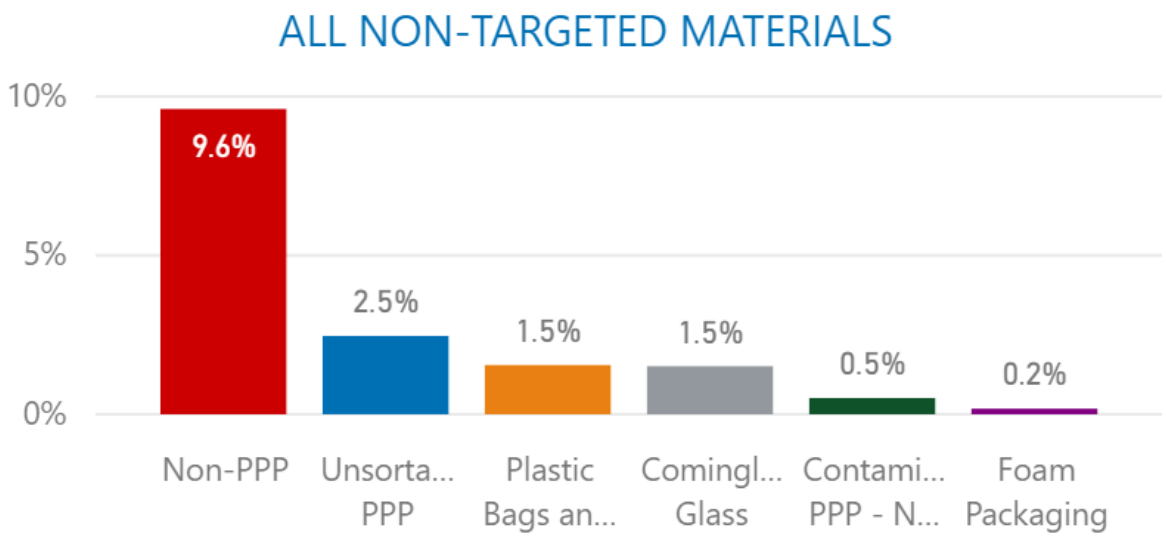
Recycling Contamination

The graphs below show the current contamination level for the City of Kelowna (Sept 2018). While data for West Kelowna, Lake Country, Peachland and RDCO is not available for Sept 2018, historical data shows that all areas have similar contamination rates and similar contaminants to the City of Kelowna.

City of Kelowna data



The following graph illustrates the top contaminates found in City of Kelowna carts, again, historical data shows that this is most likely representative of the entire region.

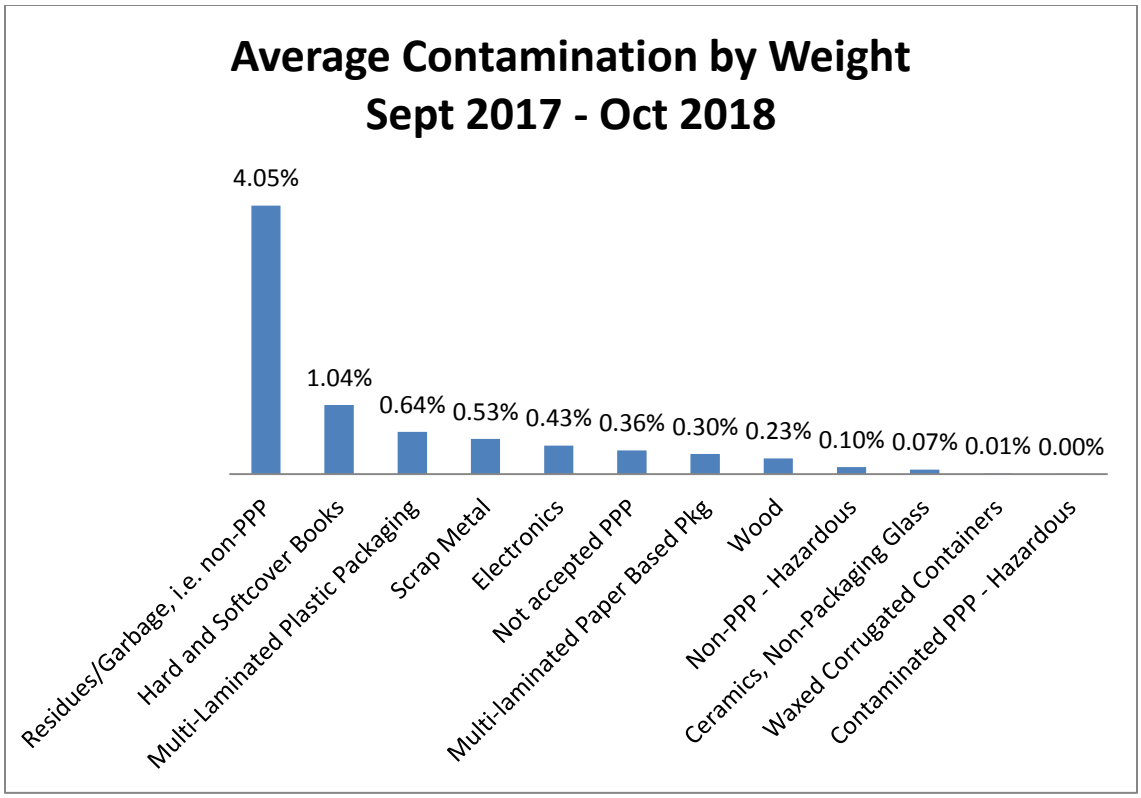


Non-PPP is defined by Recycle BC as the following items:

- Durable plastic products – plastic toys, clothes hangers, longer-term storage containers (e.g. “Tupperware”), laundry hampers etc.
- Hard and soft cover books – e.g. textbooks and novels
- Bags of mixed garbage
- Scrap metal – e.g. auto parts, pots, frying pans
- Electronics
- Textiles
- Organics – e.g. food and yard waste
- Ceramics, Non-PPP glass – e.g. bowls, drinking glasses, mirrors, windows
- Construction material and wood waste
- Hazardous Material
- Soft plastics – e.g. other flexible packaging such as cereal bags, chip bags, snack wrappers

Unsortable PPP is defined by Recycle BC as material that may otherwise be accepted and recyclable, but has been placed in collection containers by residents in a manner that does not allow the material to be recycled. Examples include residents tying their recyclables into plastic bags or nesting different types of containers together.

Analysis
Audit data shows a downward trend in the amount of Non-PPP, however the region as of Sept 2018 still has a contamination level of 8% on average. Recycle BC has provided additional breakdown of what makes up the 8% Non-PPP found in curbside carts as shown in the below chart. The top three items that don’t belong in the cart are garbage, books and multi-laminated plastics.



Residues/Garbage includes plastic products, bags of garbage, organics and yard waste, hard and soft cover books include text books and novels but does not include magazines and phone directories and multi-laminated plastic packaging includes other flexible packaging such as cereal and chip bags, snack wrappers, stand up pouches and cling wrap which can now be accepted at depots.

Material Focus for 2019

While contamination overall must be addressed, the focus of the 2019 strategy must be on products that are not recyclable, and often never have been.

- Garbage (all kinds, not just black bags, but things that have never been recyclable- pool noodles, plastic toys)
- Books
- Multi Laminated plastic packaging
- Plastic bags

Recycling Contamination Plan

Given that the RDCO receives the tops ups for education, service administration and recycling contamination, the RDCO is responsible for region-wide education program. A Recycling Contamination Reduction Plan was submitted to Recycle BC in April.

The plan outlines an approach to reducing contamination in 2019 is similar to that in 2018 with a two pronged approach of Promotion and Education (Be Cart Smart), as well as Monitoring and Enforcement. Messages will focus on the highlighted materials (garbage, books, multi-laminated plastic packaging and plastic bags).

2019 will also see the addition of cart stickers and extra cart monitoring with a stiffer view to leaving carts behind and a pilot to provide cart stickers with specific material instructions.

Monitoring and Enforcement

- Two Waste Reduction Ambassadors have been hired to monitor curbside recycling carts from May through August.
    - They will inspect approximately 1200-1400 carts per week during a 15 week period for a total of approximately 18,000 – 21,000 cart checks.
    - Oops stickers will be applied to carts along with the Be Cart Smart guide for first time offenders and those with small amounts of contaminants.
    - Cart Left Behind stickers will be applied to carts along with the Be Cart Smart guide for repeat offenders and those with significant contaminants
    - See Appendix B for samples used in 2018.

- Target areas for monitoring include but are not limited to areas not previously inspected (2017/2018), high contamination areas based on past audit info and curbside collector recommendations. Routes will be included in Kelowna, West Kelowna, Lake Country, Peachland and RDCO electoral areas.

- In August, the crews will be returning to high contamination areas on previously inspected routes to gauge compliance and leave further carts behind.

- In addition to the in-person monitoring, the RFID system (i.e. truck mounted cameras for monitoring what is in the carts) will also be used on all routes to achieve necessary goals.
    - When contamination is noted, residents are sent a warning letter, as well as a detailed recycling guide.
    - Waste Reduction Ambassadors can follow up with repeat offenders and/or involve bylaw enforcement officers.

Promotion and Education

- Cart Stickers
    - A pilot of 3000-6000 homes with adhesive stickers attached to recycling carts outlining what can go in and what must stay out.
    - Routes (about 1000 homes) will be measured for contamination in June before the cart stickers are applied and then again in August to see if contamination levels have declined.
    - At the request of Recycle BC routes will first be chosen in the biggest centres of Kelowna and West Kelowna and at the recommendation of curbside collectors for high levels of contamination.

- Be Cart Smart Campaign
    - Media tour of Cascades Recovery facility to demonstrate need for clean recyclables
    - TV ad on Global Okanagan June to August (focus of ad is what does not belong) high profile evening news positioning
    - Six week online media campaign, Castanet Media- to ‘Be Cart Smart’
    - Media Release regarding cart inspections

- Weekly Recycling tips sent out to MyWaste App users (over 11,000 total users)
- Weekly Facebook Recycle Tuesday Tips, also shared by all member municipalities to increase reach
- Weekly Facebook Cart Inspection updates every Thursday, also shared by member municipalities to increase reach
- Recycle Guide left behind at every cart that receives Oops or cart left behind sticker for duration of boots on ground
- 21,000 of Living Greener Calendars have been distributed in 2019 and contain information on what is recyclable and what is not, including depot only items
- My Waste App and My Waste App plug in on website continues with increased promotion to get more users annually – currently 16,200 subscribers and 21,300 users

- Recycling Education at Community Events- Be Cart Smart
  - Approximately 10 community events (home shows, farmers markets, seniors fair etc.)
  - Trunk Sale at Okanagan College

Financial Considerations:

Outlined below are the financial incentives provided by Recycle BC, the current cost of recycling collection, the expected revenues, the top up incentives, the depot incentives and the cost of service level failure fines.

Curbside collection financial incentives provided by Recycle BC		
Single-stream – curbside PPP excluding glass		
>2 HH/ha	$32.00/HH/yr	n/a
0.2 to 2 HH/ha	$35.40/HH/yr	CoK (1.33), WK (0.66), P (1.32), LC (0.25)
<0.2 HH/ha	$37.40/HH/yr	RDCO electoral areas (0.01)
Current contract costs for curbside recycling collection		
Cost per household (all areas)	$22.56/HH/yr	

Notes:
1. Contract costs based on recycling collection representing 26% of scheduled collections.
2. Current contract costs include collection service, cart maintenance, and RFID/camera technology.
3. Current contract costs do not include the cost of the cart.
4. Contract costs are for the new curbside contract starting October 1, 2019

Revenue projections from curbside collection financial incentives			
Municipality	**# households**	**Incentive**	**Projected revenue (annually)**
Kelowna	38,954	$35.40/HH	$1,378,972
West Kelowna	11,204	$35.40/HH	$396,622
Lake Country	4,880	$35.40/HH	$172,752
Peachland	2,505	$35.40/HH	$88,667
Electoral Areas	1,687	$37.40/HH	$63,094
TOTAL	59,230		2,100,107

Notes:

1. Based on January 2019 household counts
2. Electoral Areas only represents those on curbside collection

Resident Education and Service Administration Top Up (Received by RDCO)			
	Last Rate	Current Rate	Projected Revenue (annually)
Education Top Up	$0.75/HH/yr	$0.75/HH/yr	$4,423
Service Admin Top Up	$2.50/HH/yr	$1.75/HH/yr	$103,653
Depot Top Up (access to curbside)	$0.75/HH/yr	$0.25/HH/yr	$14,808

Depot Collection Financial Incentive		
Material	**Last Rate ($/tonne)**	**Current Rate ($/tonne)**
Film (plastic bags)	$175	$500
Styrofoam	$175	$800
Glass	$80	$90
Mixed Paper & Cardboard	$60/$80*	$60/$80*
Containers (plastics, tin, cartons)	$90/$120*	$90/$130*
Other Flexible Packaging (new Jan 2019)	N/A	$90/$130*

*rates for depots without curbside collection (i.e. Trader's Cove, North Westside Transfer Stations)

Recycle BC can penalize collectors for contaminated loads of recyclables (greater than 3 per cent at the collection stage). These are called Service Level Failures, however no penalties have been charged to the RDCO or the member municipalities to date. It should be noted that there is a significant escalation for communities over 25,000 households (i.e. City of Kelowna).

Service Level Failure (over 3% contamination) – max of 24 loads/year		
	Last Agreement	Current Agreement
Kelowna (>25,000 HH)	$5,000/load	$5,000/load year 1, $10,000/load year 2, $15,000/load year 3, $20,000/load subsequent years
West Kelowna	$5,000/load	$5,000/load
Lake Country	$2,500/load	$2,500/load
Peachland	$1,250/load	$2,500/load*
RDCO	$1,250/load	$1,250/load

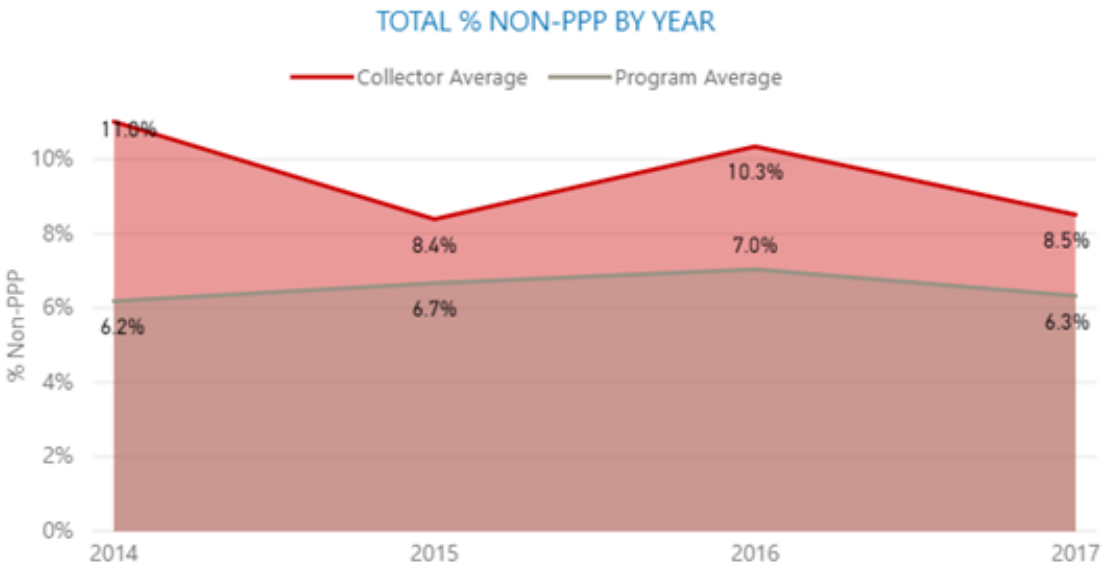
*Penalty is based on household count and Peachland moved up a category from under 2500 to over 2500 households.

Considerations not applicable to this report:

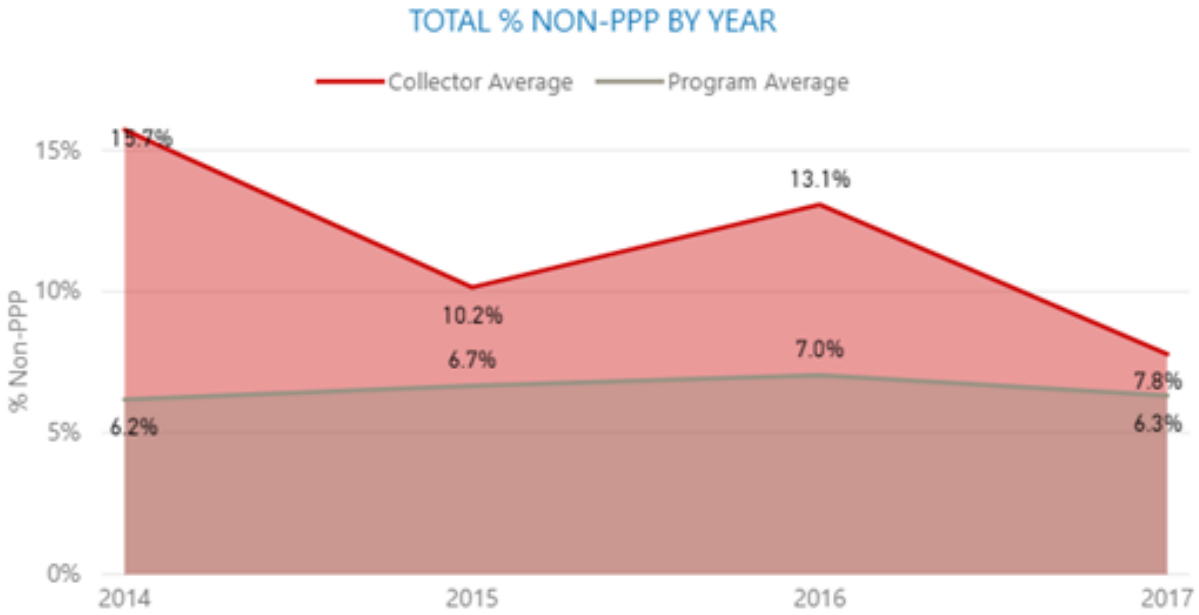
- *Organizational Issues:*
- *External Implications:*
- *Alternative Recommendation:*

Contamination Levels (per most recent Scorecards provided by Recycle BC 2017):

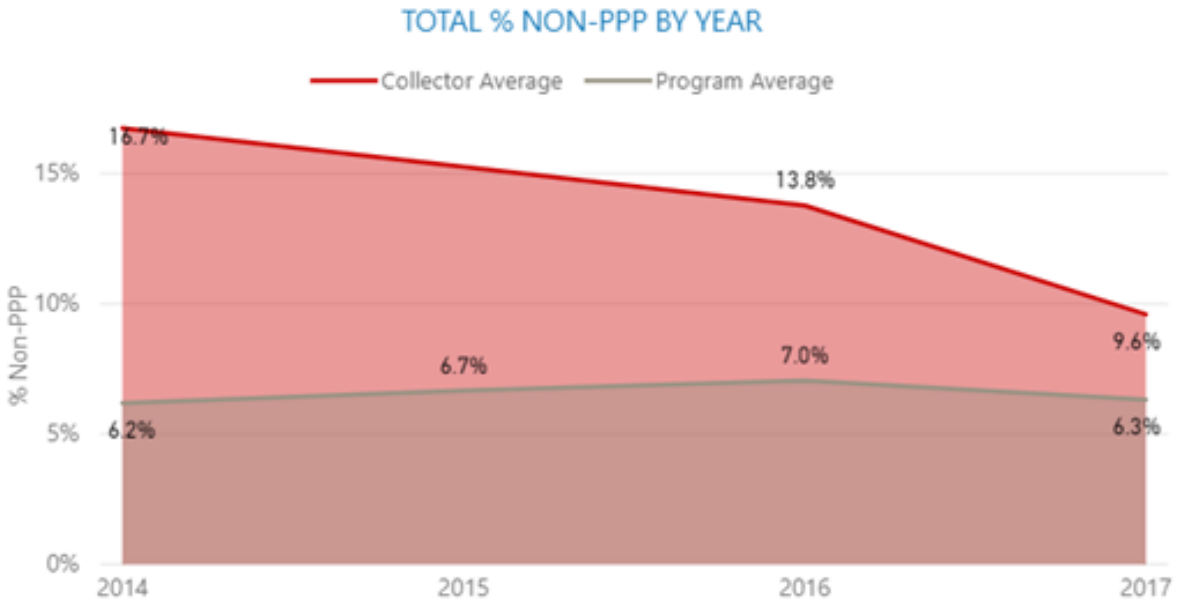
West Kelowna



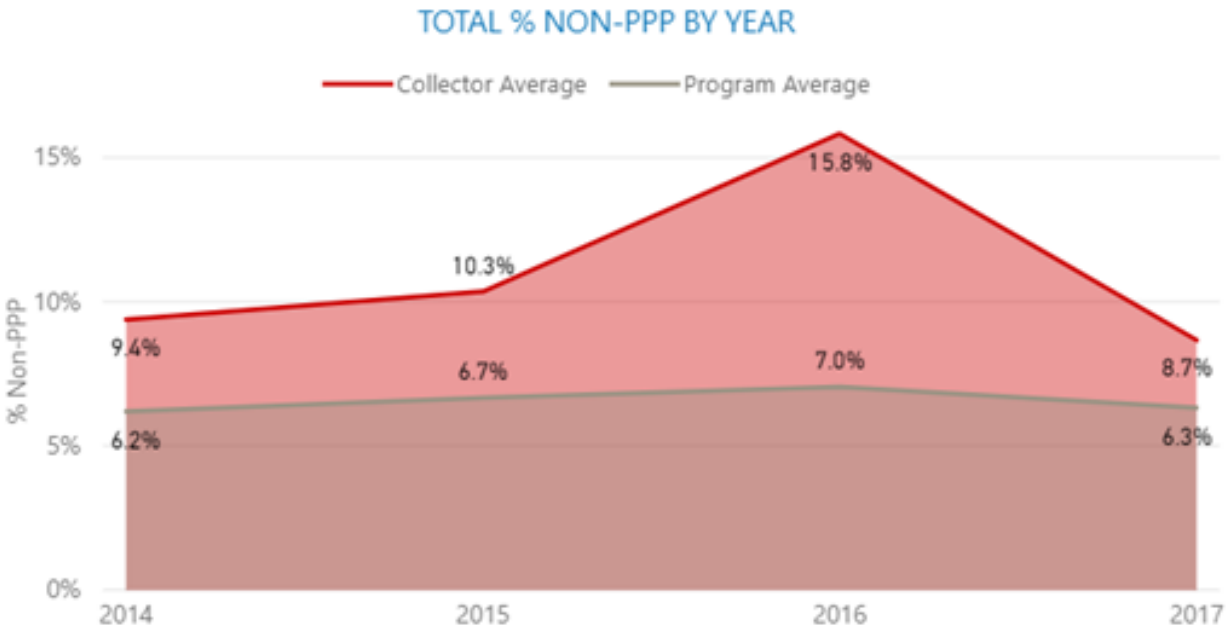
Lake Country



Peachland



RDCO Curbside



Governance & Services Committee Report

TO: Governance & Services Committee

FROM: David Komaike
Director of Engineering

DATE: May 1, 2019

SUBJECT: Water System Fees and Charges Update

Purpose: To provide the Governance & Services Committee with an update on the water system fees and charges for each Regional District owned water system and recommend the Regional Board adopt amendment bylaws approving the new rate structure for each of the water systems.

Executive Summary:

The Regional District owns and operates six water systems which service more than 1,000 users and more than 1,600 properties. The largest has almost 300 users and the smallest only 8. Notwithstanding the size of the system or the number of households served, all are required to meet the same Drinking Water Guidelines and Standards.

The long-term viability of the water systems needs to be balanced with the growing infrastructure deficit. The current replacement cost of the water systems is more than $62,000,000 and current reserve funding contributions will not be adequate.

The current water fees are composed of User Fees and Asset Renewal Fees. The User Fees apply to all lots where the water service is turned on and are intended to cover all annual operational costs of the water system. The Asset Renewal Fees apply to all lots within the service area and are intended to fund capital reserves that will be utilized on capital projects.

The User Fees are intended to fund the operation of the water systems and these fees have not changed since January 2016. The Asset Management Investment Plan ("AMIP") which forecasts the asset renewal needs to sustain the utilities was last updated in 2012.

The proposed bylaw amendments will allow the gradual increase in user fees over the next 3 ½ years by the anticipated rate of inflation – 2.0%. A separate bylaw amendment to the Water Systems Regulations Bylaw No. 1370 will adjust the fees recovered for water meters, new service connections, etc.

RECOMMENDATION:

THAT the Governance & Services Committee receive for information the water system fees and charges update for RDCO water systems; and recommends the Regional Board give

consideration and approve Water System Fees & Charges Bylaws No. 1435, 1436, 1437, 1438, 1439 and 1440.
Respectfully Submitted:

David Komaike
Director of Engineering

Approved for Committee's Consideration

Brian Reardon, CAO

Prepared by: Clarke Kruiswyk, Environmental Services Analyst

Implications of Recommendation:

General:	Accountability and sustainability
Financial:	Updates to water system rates for water systems located in the electoral areas.

Background:

The Regional District of Central Okanagan (RDCO) owns and operates six distinct water systems in the East and West Electoral areas. All of the water users are residential with the exception of the Sunset Ranch Golf Clubhouse and Westshore Estates Community Park. A summary of each system is provided in the table below.

Water System	Location	Number of Users[1]	Number of Lots[1]	Water Source	Age of System[1]
Killiney Beach	West Electoral Area. North of Fintry Provincial Park.	288	423	Okanagan Lake	39
Falcon Ridge	East Electoral Area. Joe Rich.	55	55	Mission Creek	30
Sunset Ranch	East Electoral Area. Ellison Area.	274	276	Groundwater	17
Dietrich	West Electoral Area near Peachland.	8	8	Trepanier Creek	29
Westshore	West Electoral Area. North of Fintry Provincial Park.	268	522	Okanagan Lake	49
Upper Fintry	West Electoral Area. Upslope from Fintry Provincial Park	110	327	Groundwater	7

[1] *As of March, 2019*

The current water fees are composed of User fees and Asset Renewal fees. The User fees apply to all lots where the water service is turned on and are intended to cover all annual

operational costs of the water system. The Asset Renewal fees apply to all lots within the service area and are intended to fund capital reserves that will be utilized on capital projects.

The current User fee structure is composed of a basic fee and a consumption fee. The basic fee is a flat fee that applies to all lots where the water service is turned on. The consumption fee is based on actual individual metered water consumption. The current water fee structure, including the 4-tiered consumption fee, is the same for all RDCO water systems; however, the specific fee values vary. The intention of the basic fee is to fund the fixed costs to operate each system (i.e., administration, wages, permits, insurance, and testing). The consumption fee is to fund the variable operating costs of each system (i.e., electricity to pump water, treatment, equipment wear and tear). In general for an average user, the consumption fee is approximately 20% of the basic fee which is the approximate ratio of variable operating costs to fixed operating costs.

User fee and Asset Renewal fee revenue is not pooled or shared between water system service areas or other RDCO cost centres. Revenue from each water system is only used to cover operational and capital costs within the water system where the revenue originated.

The last review updated the User fees effective January 1, 2016 and did not update the Asset Renewal fees. All fees have not changed since 2016. This review's primary focus is to update the Asset Renewal fees but also proposes updates to the basic fee of the User fees.

Asset Management Investment Plan

The Regional District engaged a third party consultant, Urban Systems, to update our Asset Management Investment Plan ("AMIP") which forecasts the asset renewal needs for the Regional District Environmental Services Department. The previous AMIP was completed in 2012 and the update accounts for changes in infrastructure and in construction costs. The AMIP outlines the following:

- Current replacement value;
- Remaining value;
- Expected life remaining;
- Required improvements;
- Infrastructure deficit;
- 20 year Average Annual Investment ("AAI"); and
- Average Annual Life Cycle Investment ("AALCI").

The AMIP is included in Appendix A and outlines that the Regional District Environmental Service Department owns infrastructure with a replacement value of approximately $159 million in water systems, sanitary systems, and solid waste assets. The table below summarizes the results by water system:

Water System	100% Replacement Value	Expected Remaining Life	Infrastructure Deficit (Backlog)	20 Year Average Annual Investment (AAI)	Average Annual Life Cycle Investment (AALCI)
Killiney Beach	$ 19,273,855	39%	$ -	$ 486,783	$ 324,569
Falcon Ridge	$ 4,206,342	59%	$ 165,000	$ 19,819	$ 60,523
Sunset Ranch	$ 7,964,002	78%	$ -	$ 41,115	$ 127,326
Dietricht	$ 657,710	56%	$ -	$ 16,571	$ 13,965
Westshore	$ 17,513,365	22%	$ 1,684,901	$ 793,798	$ 358,992
Upper Fintry	$ 12,752,730	92%	$ -	$ 17,771	$ 172,145

It is recommended that the AALCI be used to establish investment levels as it accounts for all assets and not just those that require replacing in the 20 year time horizon; however, the AAI should be considered if significant funds are required in the near term for immediate improvements (i.e., additional water treatment).

The Asset Renewal reserve levels for the water systems as of December 31, 2018 and projected to December 31, 2019 are listed in the table below:

Water System	Equipment and Capital Facility Reserves	
	2018 (actual)	2019 (projected)
Killiney Beach	$ 681,926	$ 339,916
Falcon Ridge	$ 15,769	$ 4,993
Sunset Ranch	$ 373,081	$ 416,345
Dietricht	$ 1,008	$ 2,395
Westshore	$ 1,487,165	$ 1,494,715
Upper Fintry	$ 304,710	$ 365,732

A portion of these reserve balances should be held for equipment replacements not included in the AMIP review (i.e., vehicle replacement, other minor replacements) but the remainder of the current reserves can be used to partially offset the required annual replacement costs.

The Asset Renewal fees approved in 2012 were based on funding 50% of the annual replacement costs. It was assumed that the remaining 50% would be funded through grants or borrowing. The table below summarizes the 2019 budgeted Asset Renewal revenue against the annual investment contribution at different funding levels and accounts for the current available reserve balance:

Water System	Budgeted 2019 Asset Renewal Revenue	Annual Replacement Cost at:		
		100%	75%	50%
Killiney Beach	$ 277,254.00	$ 474,783	$ 356,087	$ 237,392
Falcon Ridge	$ 25,245.00	$ 60,523	$ 45,392	$ 30,262
Sunset Ranch	$ 65,844.00	$ 109,326	$ 81,995	$ 54,663
Dietricht	$ 6,056.00	$ 16,571	$ 12,428	$ 8,286
Westshore	$ 303,222.00	$ 724,048	$ 543,036	$ 362,024
Upper Fintry	$ 63,800.00	$ 156,395	$ 117,296	$ 78,198

Based on the updated AMIP and maintaining the 50% funding ratio, the Asset Renewal fees could be adjusted as outlined in the table below:

Water System	Current Rate		50% Replacement Cost			
	Quarterly	Annual	Quarterly	Annual	Annual Change	Adjustment
Killiney Beach [1]	$ 164.25	$ 657.00	$ 164.25	$ 657.00	$ -	0.0%
Falcon Ridge	$ 114.75	$ 459.00	$ 138.00	$ 552.00	$ 93.00	20.3%
Sunset Ranch [2]	$ 54.75	$ 219.00	$ 54.75	$ 219.00	$ -	0.0%
Dietricht	$ 189.25	$ 757.00	$ 259.00	$ 1,036.00	$ 279.00	36.9%
Westshore	$ 145.50	$ 582.00	$ 173.00	$ 692.00	$ 110.00	18.9%
Upper Fintry	$ 50.00	$ 200.00	$ 60.00	$ 240.00	$ 40.00	20.0%

[1] *- AMIP suggested a rate decrease was possible to maintain the 50% replacement cost; however, the rate has been maintained due to the expected large capital costs in the near future related to water treatment improvements.*

[2] *- AMIP suggested a rate decrease was possible to maintain the 50% replacement cost; however, the rate has been maintained as it is more sustainable over the long term.*

User Fees

As outlined above, the User fees are intended to fund the operation of the water systems and the fees have not changed since 2016. It is proposed that the User fees are updated in conjunction with the proposed changes to the Asset Renewal fees. The User fees review has focused on updating the basic fee only to bring revenue in line with projected operating costs, rather than a full rate structure review similar to what was completed with the last fee changes in 2016.

The operating costs over the past five years for all water systems combined has shown variability in total annual costs. The projected costs were based on a weighted average of the actual historical costs for the past few years and the 2019 budget. This weighted average helps alleviate the annual variability in operating costs. These weighted costs were projected forward using an inflation factor to determine the required revenue and associated fees. The operating costs have increased for all water systems; however, some of the water systems have benefitted from additional users to share the costs.

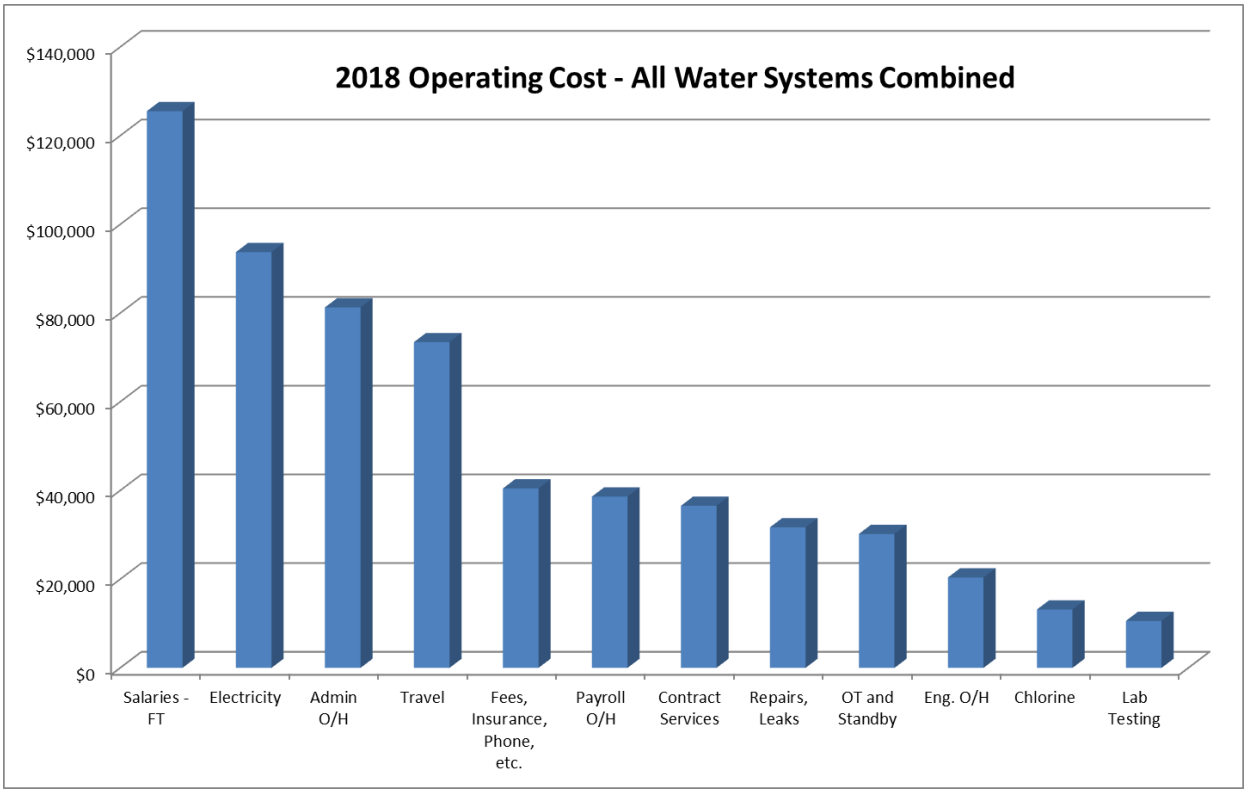
The analysis suggests that the following rate adjustments to the basic User fees are warranted:

Water System	Current Rate		Calculated Adjustment			
	Quarterly	Annual	Quarterly	Annual	Annual Change	Adjustment
Killiney Beach	$ 116.50	$ 466.00	$ 128.00	$ 512.00	$ 46.00	9.9%
Falcon Ridge [1]	$ 137.00	$ 548.00	$ 185.00	$ 740.00	$ 192.00	35.0%
Sunset Ranch	$ 90.00	$ 360.00	$ 95.00	$ 380.00	$ 20.00	5.6%
Dietricht	$ 403.00	$ 1,612.00	$ 524.00	$ 2,096.00	$ 484.00	30.0%
Westshore	$ 137.50	$ 550.00	$ 144.00	$ 576.00	$ 26.00	4.7%
Upper Fintry	$ 172.50	$ 690.00	$ 198.00	$ 792.00	$ 102.00	14.8%

[1] *- A subsequent adjustment is proposed in 2020 to account for additional increase partially attributable to the increased operating costs of the new treatment equipment (UV and filtration).*

Breakdown of Operating Costs

The figure below itemizes the 2018 cost of operating all water systems. Salaries continue to be the highest itemized cost of operation. The 2018 salaries of approximately $126,000 is a portion of the compensation for four Operators, two Lab Technicians, and one Instrument/Electrician which are positions shared between the water systems, wastewater collection, and wastewater treatment cost centers. Electricity is the second major operating costs used to power the facilities for lighting, heating, monitoring, and pumping.



How do the fees compare?

Water fees differ between each of the RDCO water systems and amongst water systems throughout the region for numerous reasons including, but not limited to:

- factors that impact economies of scale (e.g., number of users, service area),
- types and cost of water treatment,
- population density,
- age and efficiency of infrastructure,
- elevation of water source and users (i.e., pumping vs. gravity), and
- funding, asset replacement planning, and subsidizations.

Given the range of different water rate structures and funding methods in the region, it is difficult to do an accurate comparison of fees, particularly at different levels of water consumption. It is anticipated that water systems that are older, have or require additional treatment, or have fewer number of connections will have higher fees.

Resident Communication

The last three Regional District Water Talk newsletters (i.e., Spring 2018, Fall 2018, Spring 2019) have informed residents that a fee review is underway and that new fees are planned to be implemented July 1, 2019. If the fee changes are approved, the residents will be informed of the actual fee changes through:

- Information package mail out;
- Email notification to those subscribed to e-notification services;
- Detail in the next Water Talk newsletter; and
- Update to the “Estimator Tool” which residents can use to calculate their cost of water based on their individual consumption.

Residents would receive their third quarter invoices reflecting the new fees in the Fall of 2019.

Recommendation

Overall, the fees are recommended to change as outlined in the table below for each RDCO water system. For illustrative purposes, the User consumption fee for an “average” user has been included to show total costs. Some of the increases are significant, particularly for the smaller systems with no growth in the number of users, but the adjustments are necessary to fund the water system’s operation and capital reserve contributions. Please note that as the fees are proposed to be implemented mid-year 2019 the annual impact of the change will be spread over two years as can be seen in the “Annual Change” figures in the table.

With the exception of Killiney Beach and Sunset Ranch, the recommended Asset Renewal fees are based on maintaining the funding ratio of 50%; however, a higher asset replacement funding ratio could be considered in the future.

The table also includes future rate adjustments to the basic User fee and Asset Renewal fee to account for future inflation. These adjustments are based on an inflation factor of 2% which is approximately equivalent to the current Consumer Price Index (CPI). These annual adjustments for inflation should reduce the need for larger increases at future rate reviews. Throughout the annual budget review process the revenue for each system will be projected to determine if

specific fees need to be adjusted in advance of the next rate review. The next major review is planned for 2022. Please note that due to the magnitude of the basic User fee increase for Falcon Ridge, a subsequent increase of 10% is proposed for 2020. This subsequent increase is partially attributable to the increased operating costs of the recently installed UV disinfection and filtration water treatment equipment.

Each water system has their own Fees and Charges Bylaw. It is recommended that each bylaw be updated with the quarterly fees outlined in the table for July, 2019 through to December 31, 2022.

While each water system has their own Fees and Charges Bylaw, they all share the same Water Systems Regulations Bylaw No. 1370. In conjunction with the Fees Bylaw update, it is recommended that Schedule A of the Regulations Bylaw also be updated with the following:

- Update water meter fees to reflect current costs; and
- Update Extensions & Additional Service Connection costs based on current costs.

Alternate Consideration

Should the Committee wish to have additional public information distributed to the ratepayers about the proposed rate increases the following alternate resolution is provided:

"AND FURTHER THAT the Governance & Services Committee recommends the Regional Board approve First Reading for Water System Fees & Charges Bylaws No. 1435, 1436, 1437, 1438, and 1439."

Water System	Fee Type	Current	2019	2020	2021	2022
		Jan, 2016	Jul, 2019 [2]	Jan, 2020	Jan, 2021	Jan, 2022
Killiney Beach	User - Basic	$ 116.50	$ 128.00	$ 131.00	$ 134.00	$ 137.00
	User - Consumption [1]	$ 25.00	$ 25.00	$ 25.00	$ 25.00	$ 25.00
	Asset Renewal	$ 164.25	$ 164.25	$ 168.00	$ 171.00	$ 174.00
	Total	$ 305.75	$ 317.25	$ 324.00	$ 330.00	$ 336.00
	Annual Cost	$ 1,223.00	$ 1,246.00	$ 1,296.00	$ 1,320.00	$ 1,344.00
	Annual Change	N/A	$ 23.00	$ 50.00	$ 24.00	$ 24.00
Falcon Ridge	User - Basic	$ 137.00	$ 185.00	$ 204.00	$ 208.00	$ 212.00
	User - Consumption [1]	$ 32.46	$ 32.46	$ 32.46	$ 32.46	$ 32.46
	Asset Renewal	$ 114.75	$ 138.00	$ 141.00	$ 144.00	$ 147.00
	Total	$ 284.21	$ 355.46	$ 377.46	$ 384.46	$ 391.46
	Annual Cost	$ 1,136.85	$ 1,279.35	$ 1,509.85	$ 1,537.85	$ 1,565.85
	Annual Change	N/A	$ 142.50	$ 230.50	$ 28.00	$ 28.00
Sunset Ranch	User - Basic	$ 90.00	$ 95.00	$ 97.00	$ 99.00	$ 101.00
	User - Consumption [1]	$ 23.94	$ 23.94	$ 23.94	$ 23.94	$ 23.94
	Asset Renewal	$ 54.75	$ 54.75	$ 56.00	$ 57.00	$ 58.00
	Total	$ 168.69	$ 173.69	$ 176.94	$ 179.94	$ 182.94
	Annual Cost	$ 674.75	$ 684.75	$ 707.75	$ 719.75	$ 731.75
	Annual Change	N/A	$ 10.00	$ 23.00	$ 12.00	$ 12.00
Dietrich	User - Basic	$ 403.00	$ 524.00	$ 534.00	$ 545.00	$ 556.00
	User - Consumption [1]	$ 186.50	$ 186.50	$ 186.50	$ 186.50	$ 186.50
	Asset Renewal	$ 189.25	$ 259.00	$ 264.00	$ 269.00	$ 274.00
	Total	$ 778.75	$ 969.50	$ 984.50	$ 1,000.50	$ 1,016.50
	Annual Cost	$ 3,115.00	$ 3,496.50	$ 3,938.00	$ 4,002.00	$ 4,066.00
	Annual Change	N/A	$ 381.50	$ 441.50	$ 64.00	$ 64.00
Westshore	User - Basic	$ 137.50	$ 144.00	$ 147.00	$ 150.00	$ 153.00
	User - Consumption [1]	$ 33.73	$ 33.73	$ 33.73	$ 33.73	$ 33.73
	Asset Renewal	$ 145.50	$ 173.00	$ 176.00	$ 180.00	$ 184.00
	Total	$ 316.73	$ 350.73	$ 356.73	$ 363.73	$ 370.73
	Annual Cost	$ 1,266.90	$ 1,334.90	$ 1,426.90	$ 1,454.90	$ 1,482.90
	Annual Change	N/A	$ 68.00	$ 92.00	$ 28.00	$ 28.00
Upper Fintry	User - Basic	$ 172.50	$ 198.00	$ 202.00	$ 206.00	$ 210.00
	User - Consumption [1]	$ 22.31	$ 22.31	$ 22.31	$ 22.31	$ 22.31
	Asset Renewal	$ 50.00	$ 60.00	$ 61.00	$ 62.00	$ 63.00
	Total	$ 244.81	$ 280.31	$ 285.31	$ 290.31	$ 295.31
	Annual Cost	$ 979.25	$ 1,050.25	$ 1,141.25	$ 1,161.25	$ 1,181.25
	Annual Change	N/A	$ 71.00	$ 91.00	$ 20.00	$ 20.00

[1] *- Based on 2018 annual average consumption per connection by water system*

[2] *- Annual cost for 2019 based on July, 2019 effective date*

Attachment(s):
Asset Management Investment Plan, Urban Systems 2018

Asset Management Investment Plan

(An Asset Renewal Forecast)

prepared for:
Regional District of Central Okanagan

NOVEMBER 2018

URBAN systems

TERMS AND DEFINITIONS

The following commonly used terms are defined as they relate to the Asset Management Investment Plan (AMIP).

ANNUAL AVERAGE LIFE CYCLE INVESTMENT (AALCI): Annual budget based on annual average of the total replacement value of an asset over its expected service life determined by the asset management plan

ASSET: A physical component of a system that has value, enables services to be provided, and has an economic life of greater than 12 months

ASSET CONDITION: The state of an asset, particularly regarding its appearance, quality, or working order

ASSET MANAGEMENT: The process of making decisions about the use and care of infrastructure to deliver services in a way that considers current and future needs, manages risks and opportunities, and makes the best use of resources

ASSET MANAGEMENT PLAN: A long term plan to identify asset management needs, establish longer term financing means, and regularly schedule maintenance, rehabilitation and replacement works for the long-term sustainability of the asset

ASSET MANAGEMENT POLICY: Principles and mandated requirements derived from, and consistent with, the organizational strategic plan, providing a framework for the development and implementation of the asset management strategy and the setting of the asset management objectives

ASSET MANAGEMENT STRATEGY: Long-term optimized approach to management of the assets, derived from, and consistent with, the organizational strategic plan and the asset management policy

ASSET RENEWAL: Work on an asset (or component) that brings the asset back to new condition or the complete replacement of the asset (in situ) with a new asset providing the original (intended) level of service

COST: In asset management, the financial and human resources required throughout the lifecycle of the asset

INFRASTRUCTURE RENEWAL DEFICIT (BACKLOG): A measure of the amount of infrastructure that has passed its theoretical service life but is still providing service to the community

LEVEL OF SERVICE: A measure of the quality, quantity, and/or reliability of a service from the perspective of residents, businesses, and customers in the community

LIFE CYCLE COSTS: The total costs estimated to be incurred in the design, construction, operation, maintenance, and final disposition of a physical asset or system over its anticipated useful life span

LIFE CYCLE MANAGEMENT: Retaining an asset as near as practicable to its original condition, from the point when a need for it is first established, through its design, construction, acquisition, operation and any maintenance or renewal, to its disposal

REVENUE: The income received by the RDCO from taxes, user fees, government transfers and other sources. Own sources revenues is income received from taxation, user fees, and any interest income.

RISK(S): Events or occurrences that will have an undesired impact on services (Risk = Impact x Likelihood)

Asset Risk – An event where an asset failing to perform as you need it to. Examples of asset risks are a broken sewer pipe or potholed road surface.

Strategic Risk – Events or occurrences that impact your ability to achieve objectives.

REGULATORY REQUIREMENT: Capital works to meet existing or new provincially or federally legislated standards.

SERVICE: A system that fulfills a public need such as transportation and sewage collection

SERVICE LIFE: The estimated lifespan of a depreciable fixed asset, during which it can be expected to contribute to a municipality's operations/service delivery

TANGIBLE CAPITAL ASSET (TCA): An Asset that has a physical form for use in the operations and delivery of services. Tangible assets include fixed assets, such as water, sewer, roadways and buildings (fixed assets are sometimes referred to as 'plant'). Tangible capital assets must be accounted for and reported as assets on the Statement of Financial Position as part of PS 3150.

TRIPLE BOTTOM LINE APPROACH: Utilizing economic, social and environmental metrics (i.e. quantifiable impacts to costs, mobility, and watercourses/habitats) in assessing and/or prioritizing investments.

USEFUL LIFE: The minimum life expectancy commonly used for asset life. This is typically used for TCA reporting (as opposed to for asset management purposes).

INVESTMENT LEVEL INDICATORS

ANNUAL AVERAGE LIFE CYCLE INVESTMENT (AALCI)

The Average Annual Life Cycle Investment (AALCI) is defined as the summation of each asset's annual depreciation. It represents the annual investment needed to sustain existing infrastructure over its service life (over the next 20 years and beyond).

Note: AALCI must be considered in conjunction with unfunded liability as this is a forward-looking parameter that does not consider the past.

20 YEAR AVERAGE ANNUAL INVESTMENT (20 YEAR AAI)

The 20 Year Average Annual Investment (20 Year AAI) is defined as the summation of expenditures over a 20 year planning horizon divided by 20. It represents the annual investment needed to pay for expected infrastructure replacements over the next 20 years (within the 20 year horizon).

INFRASTRUCTURE DEFICIT

Unfunded Liability is a measure of the amount of infrastructure that has passed its theoretical service life but still provides service to the community. This infrastructure should be inspected to determine if replacement is necessary or if replacement timing can be adjusted.

Note: The presented indicators do not take into account level of service, existing reserve balances, risk, all future capital needs (water treatment is included), or willingness to take on risk. Over time, as the community gathers more information and further develops their asset management system, these investment figures should be further refined and adjusted.

EXECUTIVE SUMMARY

The Regional District of Central Okanagan (RDCO) Environmental Services Department owns and maintains a large portfolio of infrastructure assets upon which it greatly relies for the delivery of services to the region. This infrastructure includes the ESD's water systems, sewer systems, solid waste assets as well as a wide variety of vehicles.

Some of the RDCO's assets, such as the Killiney Beach water system, date back to the 1960's while the sewer system is relatively young at 1990's. These assets, and others, have served the community well however many of these assets are now nearing the end of their useful lifespans and will eventually need to be replaced or rehabilitated.

The Asset Management Investment Plan (AMIP) provides a review of RDCO's Water, Sanitary, and Solid Waste assets to answer the following questions;

1. What assets does the RDCO own?
2. What is the forecasted cost to replace the asset?
3. How much money needs to be invested annually (on average) to sustain the RDCO's assets?

By understanding the answer to these questions, the RDCO will be able to budget and plan for the replacement of their infrastructure. Failure to plan would put the community at risk of service disruptions, emergency repairs and the need for sudden and significant tax and user fee increases.

By being proactive today the RDCO can ensure that services are sustainable so that current and future generations can enjoy the same levels of service as well as user fees and charges.

Table 1.1: 20 Year Average Annual Invesment and Average Annual Life Cycle Investment

Asset Category	20 Year Average Annual Investment (AAI)	Average Annual Life Cycle Investment (AALCI)
Killiney Water System	$486,783	$324,569
Falcon Ridge Water System	$19,819	$60,523
Star Place Water System	$16,571	$13,965
Sunset Ranch Water System	$41,115	$127,326
Westshore Water System	$793,798	$358,993
Fintry Water System	$17,771	$172,145
Sanitary Sewer System		
Westside Collection	$57,888	$354,808
Treatment	$1,498,799	$1,828,863
Sunset Sanitary	$0	$38,798
Solid Waste	$582,878	$583,828
Total	**$3,515,422**	**$3,863,818**

WHAT ASSETS DOES THE REGIONAL DISTRICT OWN?

For the purposes of the AMIP the RDCO's assets have been separated into 3 categories: water system, sanitary system, and solid waste.

The sanitary sewer is comprised of approximately 20km of sewer pipes in addition to manholes, lift stations, force mains and treatment facilities.

The water system is compromised of six separate water systems which include Killiney Beach, Falcon Ridge, Sunset Ranch, Westshore, Fintry and Star Place, each of which have a series of water pipes, reservoirs, pumps and treatment facilities.

The solid waste category includes the curbside carts and transfer stations.

All of these infrastructure assets are required to deliver the services that are valued by the residents of Central Okanagan.

WHAT IS THE COST TO REPLACE THE ASSETS?

The total replacement value of the RDCO's infrastructure is approximately $140 million, based on current construction costs. Broken down as follows:

Sanitary System $85M

Water Systems $62M

Solid Waste $12M

The water and sewer systems make up the majority of the infrastructure value (91%) with solid waste accounting for 9% of the total value. The Wastewater Treatment Plant is valued at $50M or 36% of the total infrastructure value.

HOW MUCH MONEY NEEDS TO BE INVESTED ANNUALLY?

There is no single "correct" answer to this question. Accurately predicting when infrastructure will need to be replaced is very difficult if not impossible to do. The service life of an asset such as a pipe depends on many factors such as the materials it is constructed from, the properties of the soils that it is buried in, how it was installed and many, many other factors. For this reason lifespan estimates are generally based on "rule of thumb" values. Most rule of thumb lifespans applied by engineers are conservative (on the safe side). In reality many assets could actually last much longer (50% longer or possibly more) than these estimates. For this reason, we have included two indicators for informing the targeted annual investment amount: the annual average life cycle investment (AALCI) and the 20 year average annual investment (AAI). See Table 1.1 for details.

The AALCI is presented at $3.8M/yr using the conservative rule of thumb lifespan. The AAI is $3.5M/yr for the twenty year horizon using the same service life estimates. By assuming the assets will last longer (lower annual investment level) the RDCO assumes more risk. It is at the discretion of the RDCO Board to decide what level of risk they are comfortable with and to revisit those assumptions on a regular basis. The focus of this report supports the conservative measure of funding the AALCI; however, the AAI should be considered if more funds are required in the near term for immediate improvements.

INTRODUCTION

Many governments, like RDCO, are turning toward asset management as a process for making informed infrastructure decisions, build financial capacity to renew, operate and maintain existing infrastructure so that the RDCO can continue to provide services, effectively manage risks, and provide tax payers with the best value for money.

A key next step for RDCO in achieving this outcome is to improve its understanding of costs through completing a detailed asset assessment (cost forecast) of the community's future infrastructure renewal investment requirements. This forecast will provide staff with improved information (cost and timing) and key indicators to inform infrastructure investment decision-making and assist in aligning priorities and setting utility rates. To accomplish this, the RDCO engaged Urban Systems to complete a long term (integrated) Asset Management Investment Plan (AMIP).

The AMIP is based on the BC Framework (see Figure 1.1) and was developed to identify and assess the expected replacement costs and needs for each of RDCO's assets. The AMIP (Appendix A) consolidates all of the long term costs and timing for a community's major infrastructure categories into a long-term asset renewal forecast. This enables the RDCO to see a forecast of their infrastructure's life cycle cost pressures in one place, at a glance. The AMIP is also an ideal tool to engage rate payers by showing how infrastructure performance and age is linked to annual investments (into reserves or renewal projects). The AMIP includes details and summaries of:

- current replacement value
- infrastructure deficit
- looming future costs
- AALCI required for on-going investment planning
- forecasted renewal of public infrastructure (AAI)

WHAT IS ASSET MANAGEMENT?

The process of bringing together the skills and activities of people; with information about the community's physical infrastructure assets and financial resources to ensure long term sustainable service delivery.

Sound asset management practices support sustainable service delivery by considering community priorities, informed by an understanding of the trade-offs between the available resources, risk and the desired services.

Sustainable service delivery ensures that current community services are delivered in a social, economic, and environmentally responsible manner that does not compromise the ability of future generations to meet their own needs.

Figure 1.1: Asset Management for Sustainable Service Delivery, A BC Framework

CANADIAN'S INFRASTRUCTURE CHALLENGE

Communities across Canada are currently faced with infrastructural and organizational challenges. Many are realizing that the majority of their infrastructure was installed decades ago and has continually provided service to the community with little to no service disruption. These assets, which have provided significant value to the community, are now nearing the end of their useful life; however, many local governments have not fully planned for their replacement.

FCM recently completed a study that concluded that estimates Canada's infrastructure deficit to be 123 billion and growing. A recent study by BCWWA, titled "Are our water systems at risk?" found that the majority of BC water and sewer systems are not recovering the full cost of service delivery through user fees.

With increasing cost pressures and unsustainable funding approaches, communities are beginning to realize they need to change the way they think about managing their assets, recovering revenues, and delivering services. Communities are now embracing the need to integrate asset management principals and thinking into their organization with the goal to:

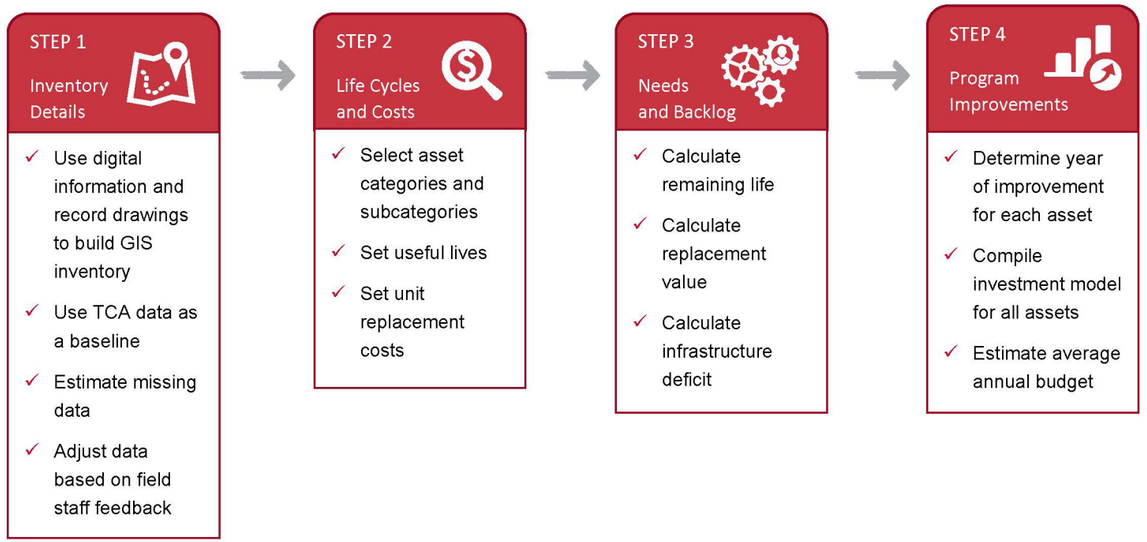
- be financially sustainable over the long term;
- reduce the need to place a large financial burden on future generations;
- increase the likelihood that user fees and rates are stable and consistent and reduce the need to have large 'one-off' increases; and
- increase the likelihood that service levels can be maintained over the long term

With this understanding, the RDCO has invested in developing an Asset Management Investment Plan (AMIP) as the first step in better understanding their own unique infrastructure challenges.

AMIP METHODOLOGY

The AMIP forecast is predominantly based upon infrastructure service lives, but also considers condition assessment information where available. To develop the AMIP, a 4-Step analytical approach was used (see Figure 2.1 below).

Figure 2.1: AMIP Development Steps



RDCO's AMIP for asset renewal was built using the best linear and non-linear asset data available. The most recent digital infrastructure information for RDCO has been reviewed for use in developing the AMIP. This information is primarily based on compiled infrastructure record drawings and GIS datasets received from the RDCO, coupled with information from the Tangible Capital Assets (TCA) inventory. An estimate was made for missing data where possible. The GIS information was the primary source used for the majority of the asset inventory which was cross checked against the operations department's record information and anecdotal knowledge of the systems.

As a next step in the evolution of the RDCO's asset management process, the AMIP inventory should be built upon to develop a prioritized capital plan based on risk, service and cost. It also is suggested that the RDCO continue to undertake an on-going program for improving data collection in order to refine the complete data set for long term asset management purposes.

[1]The expected life remaining is a ratio between remaining life and replacement value. This is based on straight line depreciation of the asset over its service life.

[2]AALCI is the annual depreciation of the replacement value. The AALCI represents the ideal annual budget allocation. Annual surpluses would go into reserves and be drawn upon for renewal of assets. When the annual budget is less than the AALCI, the sustainability gap grows.

The AMIP outlines the following:

- Current replacement value;
- Remaining value;
- Expected life remaining;
- Required improvements;
- Infrastructure deficit (backlog);
- 20 year renewal costs and timing (including future looming costs); and,
- Average Annual Life Cycle Investment (AALCI)

The AMIP is a spreadsheet which is delivered in three (3) inter-connected levels:

1. Summary for investment planning and decision-makers;
2. Detailed data for ongoing reporting, operations and maintenance; and
3. Highly detailed segment by segment information regarding the linear infrastructure such as pipe and roads.

The benefits of the AMIP's Level 1 summary include:

- Presents a complete and concise summary of all infrastructure assets on 1 page;
- Provides a comprehensive focus and format for community infrastructure outreach programs;
- Uses very detailed information from Level 2, which provides invaluable asset details for more credible and defensible decisions on infrastructure re-investment; and
- Encourages exploration of sustainable infrastructure renewal funding levels.

HOW TO USE THE INVESTMENT PLAN MODEL

The forecast model is driven by input tables; however, when sufficient data is not available for the input tables, or asset-specific changes are made, then estimates are done in the excel worksheets. In addition to its financial information, the investment plan database also uses the following asset attributes:

- Location
- Material or Make
- Size or Model
- Dimensions
- Quantity
- Year Built
- Service Life
- Condition rating (where available) and
- Installation cost:
  Recent Tendered Construction costs;
  Construction contingency costs;
  Planning and design costs;
  Project management costs; and
  Construction administration costs.

Figure 2.2 Informed Decision Making

The AMIP model is designed to keep calculating year after year. The AMIP can be updated each year by adjusting the model to the current year (Input Table), updating unit costs and other replacement values to reflect inflation, and updating the asset inventory to include annual project renewals, decommissioning, and new acquisitions.

The power of the AMIP model is that it uses actual replacement costs, service lives based upon healthy maintenance programs, and summarizes all infrastructure information in Level 1 to assist RDCO in better understanding their cost pressures to help inform their budgeting and infrastructure decisions (Figure 2.2).

AMIP RESULTS

The AMIP's Level 1 summary presents a one page overview of asset renewal needs, rolled-up for all asset categories and sub-categories in RDCO. It presents the current renewal investment forecast for RDCO's major asset categories over a 20 year period, using a conservative life span estimate and includes indicators for forecasting a sustainable infrastructure funding level.

This AMIP scenario assumes that an adequate annual operations and maintenance (O&M) budget is in place to optimize asset service lives. Reduced or inadequate O&M budget levels would reduce the service lives. More detailed information regarding each individual asset categories can be seen in the level 2 summaries (section 4). Table 1.2 summarizes the key results of the AMIP.

Table 1.2: AMIP Summary

Asset Category	100% Replacement Value	Expected Remaining Life	Infrastructure Deficit (Backlog)	20 Year Average Annual Investment (AAI)	Average Annual Life Cycle Investment (AALCI)
Killiney Water System	$19,273,855	39%	$0	$486,783	$324,569
Falcon Ridge Water System	$4,206,342	69%	$165,000	$19,819	$60,523
Star Place Water System	$657,710	56%	$0	$16,571	$13,965
Sunset Ranch Water System	$7,964,002	78%	$0	$41,115	$127,326
Westshore Water System	$17,513,365	22%	$1,684,901	$793,798	$358,992
Fintry Water System	$12,752,730	92%	$0	$17,771	$172,145
Sanitary Sewer System					
Westside Collection	$24,315,287	70%	$850,000	$57,888	$354,808
Treatment	$56,381,162	65%	$7,636,441	$1,498,799	$1,828,863
Sunset Sanitary	$3,872,645	87%	$0	$0	$38,798
Solid Waste	$11,682,562	53%	$0	$582,878	$583,828
Total	**$158,619,663**	**60%**	**$10,336,342**	**$3,515,422**	**$3,863,818**

Average Annual Life Cycle Investment (AALCI): forecasted annual investment needed to sustain existing infrastructure over its service life (over the next 20 years and beyond).

20 Year Average Annual Investment (AAI): total forecasted investment needed to replace infrastructure that has passed its theoretical service within the next 20 years.

Infrastructure Deficit (Unfunded Liability): is a measure of the amount of infrastructure that has already passed its theoretical service life but is still providing service to the community. This infrastructure should be inspected to determine if replacement is necessary or not.

Figure 3.2 Infrastucture Value Distribution

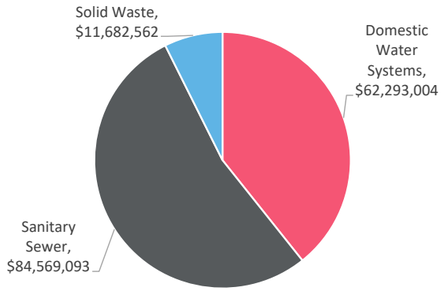
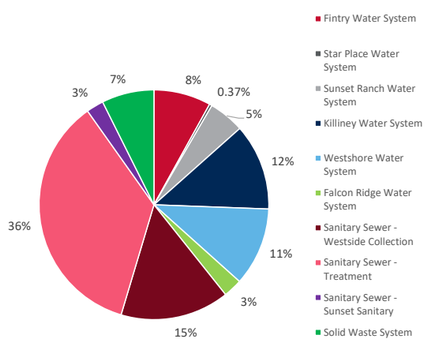


Figure 3.3 AALCI Value Distribution



ASSET REPLACEMENT VALUE

The estimated full replacement value of RDCO's major infrastructure assets is approximately $158 million (2018) based on current tender prices in the BC Interior region and best practices for setting service lives. A copy of the inputs (unit costs and service lives) is located in Appendix B.

Table 1.2 (above) provides a summary of the replacement value of existing infrastructure; with some regulatory requirements for the water system included. The AMIP should be used to inform the development of a comprehensive capital plan so that these items can be integrated together.

Figure 3.2 illustrates the percent breakdown of RDCO's infrastructure value by asset category.

Approximately 90% of RDCO's infrastructure is made of up Water and Sanitary assets which mean majority of the total long term expenditures should be on these assets. On average, RDCO assets are considered to be in fair to good condition with an average expected remaining life of 67% and there are assets ($10.3M) that have passed their theoretical service life which should be inspected in the field prior to investing in their replacement. In the twenty year horizon there is approximately $67M forecasted in assets that may need to be renewed. These results are comparable to other communities of similar size and age to RDCO.

INFRASTRUCTURE DEFICIT (UNFUNDED LIABILITY)

Infrastructure deficit ($10.3M) is a measure of the amount of infrastructure that has passed its theoretical service life but is still providing service to the community.

Current Year > Year of Asset Renewal

Although the asset is still providing service, it is typically nearing the end of its life and will require field investigation to determine if the asset needs to be replaced or not. Changes in the asset service life can turn future expenditures to a deficit or vice versa. For example: an asset is scheduled for replacement in 2018 which means the asset has passed its theoretical service life and will be recorded as a deficit. If that assets service life is extended, the asset is now scheduled in a future year as an asset replacement and not a deficit.

AVERAGE ANNUAL LIFE CYCLE INVESTMENT (AALCI)

The Average Annual Life Cycle Investment (AALCI) is defined as the summation of each asset's annual depreciation which is based on the assets replacement cost and service life.

$$\sum \frac{\text{Replacement Cost}}{\text{Service Life}}$$

The AALCI ($3.8M) is the forecasted ideal (maximum) funding level for sustaining existing infrastructure over the life cycle of the assets and should be a long term target for the community. When planned for appropriately, the AALCI can be used in ensuring long term revenue stability, preventing unnecessary risk, and enabling a community to apply one-time funding to support new asset/capital needs as opposed to addressing emergency situations.

Ideally RDCO should endeavor, depending on risk tolerance and service levels, to budget for this amount each year, and what is not spent goes into infrastructure reserve accounts for future renewal. Figure 3.3 illustrates the value and percent breakdown of RDCO's AALCI distribution based on the conservative estimate of service life scenario.

20 YEAR AVERAGE ANNUAL INVESTMENT (AAI)

Another indicator that can be used to determine the appropriate investment level is the 20 Year Average Annual Investment (AAI).

$$\frac{\text{Total Anticipated 20 Year Capital Expenditure}}{\text{20 Years}}$$

This indicator provides a value of how much should be invested on an annual basis at a minimum to fund asset replacements anticipated over the next 20 years ($3.5M).

Service life directly affects the timing of the 20 year expenditures as it dictates when an asset is scheduled for replacement. For example: If the asset service life is extended, the replacement year might change from 2035 to 2045 which defers the project outside the 20 year planning horizon and reduces 20 Year AAI. It is important to note that this does not make the expenditure disappear but instead it just postpones it. This is why the AALCI may be better long term financial indicator (target) because it accounts for replacements outside the planning horizon.

RDCO should consider its affordability limits, costs, risk and service in determining the annual investment amount into infrastructure. Later sections of this report provides some considerations and recommendations for RDCO in considering its sustainable infrastructure funding levels.

STATE OF RDCO'S INFRASTRUCTURE

This section details the AMIP findings by each of the RDCO's asset categories (Level 2).

1 What assets do we own?

Taking stock of assets within a community is foundational to the development of an AMIP. The first step in building an inventory is gathering all available data, then collecting important attributes for each asset such as: quantity, diameter, year of installation, material, etc.

The value of this inventory extends well beyond this project as this database can now be used as the central source of asset information moving forward.

The methodology used to compile this inventory is detailed in Appendix A.

2 How much are our assets worth?

Calculating the replacement cost of a community's assets provides the organization with a deeper understanding of the magnitude of infrastructure that it is responsible for managing and replacing. These cost figures directly affect the asset reinvestment level and are a driver for future revenue requirements. Replacement costs presented in this report represents the magnitude of investment required to replace all assets as they exist today. The asset replacement costs typically do not account for new investment required to satisfy; regulatory requirements, growth/ expansion, safety improvements, or economic development.
In this report, we have at the request of RDCO, included cost for future regulatory requirements (ie. UV Treatment)

3 How much life is left in our assets?

Remaining life of an asset is one indicator that can be used to understand the theoretical condition of an asset. The condition of the asset can then inform asset reinvestment and inspection programs.

Since the actual physical condition of the asset is not known, the age of the asset is used to estimate its condition (refer to Terms and Definitions)

4 When will our assets pass their estimated service life?

Accurately predicting when infrastructure will need to be replaced is difficult, if not impossible, to do. The service life (how long an asset will last) is a highly uncertain parameter that is affected by many factors such as material, environment, and construction techniques. Nonetheless, mapping replacement timing is valuable in helping communities begin planning for future expenditures. For example, the investment cost forecast may show a significant expenditure in 2025, representing a large number of watermains that are predicted to need replacing. While it is unlikely that all of these watermains would need to be replaced at the same time, replacement timing estimates provide an indication that a large investment might occur and that further investigation is required to confirm the urgency of these investments.

5 How much do we need to invest in our assets?

Predicting the right investment level needed for infrastructure renewal requires significant thought and discussion amongst stakeholders. To better understand a community's initial long-term investment needs, three indicators have been calculated.

- Investment Level Indicators:
  1) Average Annual Life Cycle Investment (AALCI)
  2) 20 Year Average Annual Investment (20 Year AAI)
  3) Infrastructure Deficit (Unfunded Liability)

  (refer to Terms and Definitions)

- Each of these indicators are calculated using replacement costs and service life estimates. Accurately predicting when infrastructure will need to be replaced is very difficult to do. For this reason, lifespan estimates are generally based on rule of thumb values. Most rule of the thumb lifespans applied by engineers are conservative (on the safe side). In practice, many assets could last much longer (25% longer or possibly more) than these estimates. For these reasons, we have developed three service life scenarios (refer to terms and definitions) which will help highlight how investments level would change depending on the various lifespan assumptions.

- Each of these questions (1 to 5) is graphically presented in the body of this report.

- These investment level indicators do not account for existing reserves balances or future grants. These indicators are to be used as a forecast of costs to inform the RDCO's revenue requirements.

WATER SYSTEMS – KILLINEY

What assets do we own?

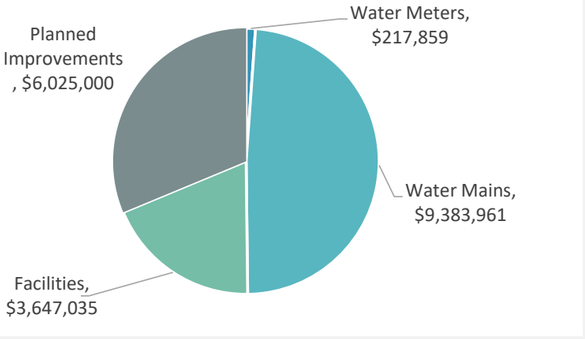
Watermain 14.3 km

Pumps 4

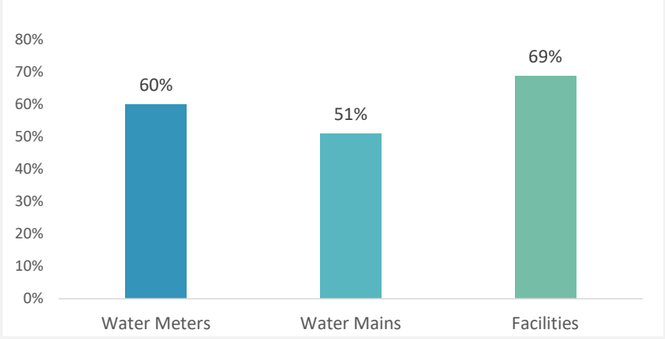
Reservoirs 4

PRVs 2

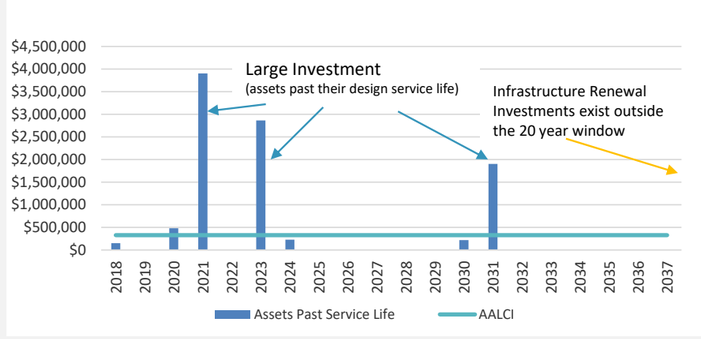
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$217,859	60%	$10,893	$10,893
Water Mains	*Diameter (mm)*				
>= 600	>= 600	$0	0%	$0	$0
500	500	$0	0%	$0	$0
450	450	$0	0%	$0	$0
400	400	$0	0%	$0	$0
350	350	$0	0%	$0	$0
300	300	$0	0%	$0	$0
250	250	$154,400	65%	$0	$1,544
200	200	$1,267,793	62%	$23,930	$12,678
150	150	$3,908,554	62%	$23,932	$39,086
<150	<150	$4,053,216	36%	$89,278	$40,532
		$9,383,961	**51%**	**$137,140**	**$93,840**
Facilities					
Reservoirs		$1,770,035	83%	$0	$22,125
Pumphouse		$1,427,000	62%	$30,000	$35,675
Intakes		$300,000	56%	$0	$3,750
PRV's		$150,000	0%	$7,500	$4,286
		$3,647,035	**69%**	**$37,500**	**$65,836**
Total without Planned Improvements		**$13,248,855**	**56%**	**$185,533**	**$170,569**
Planned Improvements					
Back-up Generator (3)		$225,000	0%	$11,250	$9,000
Treatment		$5,800,000	0%	$290,000	$145,000
		$6,025,000	**0%**	**$301,250**	**$154,000**
Grand Total		**$19,273,855**	**39%**	**$486,783**	**$324,569**

WATER SYSTEMS – FALCON RIDGE

What assets do we own?

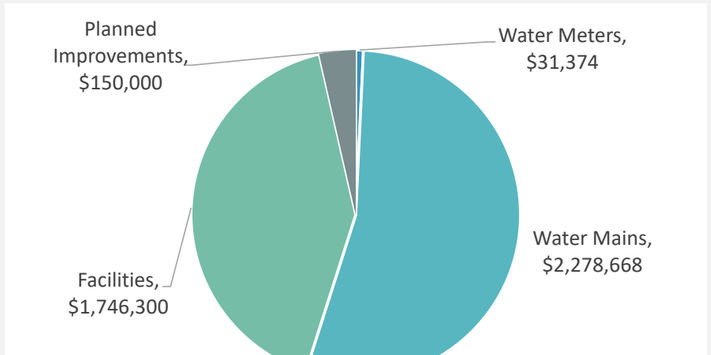
Watermain 3.3 km

Pumps 1

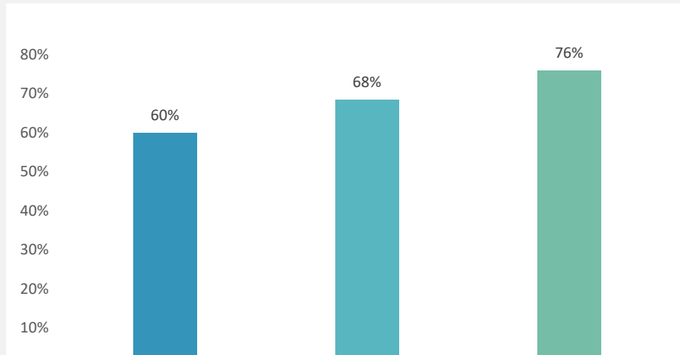
Reservoirs 1

PRVs 0

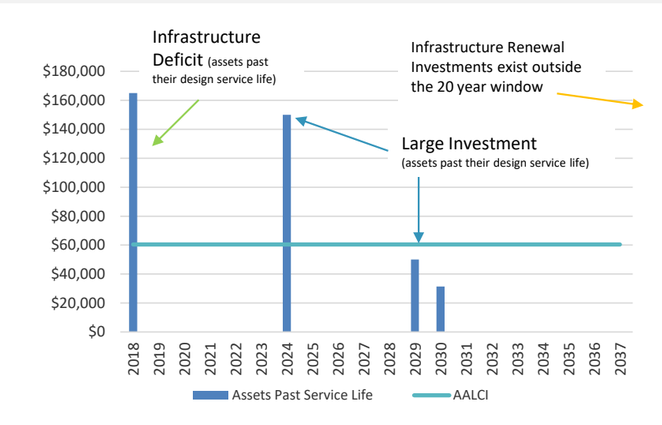
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$31,374	60%	$1,569	$1,569
Water Mains	***Diameter (mm)***				
200	200	$0	0%	$0	$0
150	150	$1,563,690	71%	$0	$15,637
100	100	$714,978	63%	$0	$9,201
		$2,278,668	**68%**	**$0**	**$24,838**
Facilities					
WELL KIOSK		$15,000	0%	$750	$600
WELL		$150,000	0%	$7,500	$6,000
PUMPHOUSE		$50,000	28%	$2,500	$1,250
INTAKE		$150,000	98%	$0	$3,000
RESERVOIRS + UV		$1,381,300	84%	$0	$17,266
		$1,746,300	**76%**	**$10,750**	**$28,116**
Total without Planned Improvements		**$4,056,342**	**72%**	**$12,319**	**$54,523**
Planned Improvements					
Back-up Generator (2)		$150,000	0%	$7,500	$6,000
Grand Total		**$4,206,342**	**69%**	**$19,819**	**$60,523**

WATER SYSTEMS – SUNSET RANCH

What assets do we own?

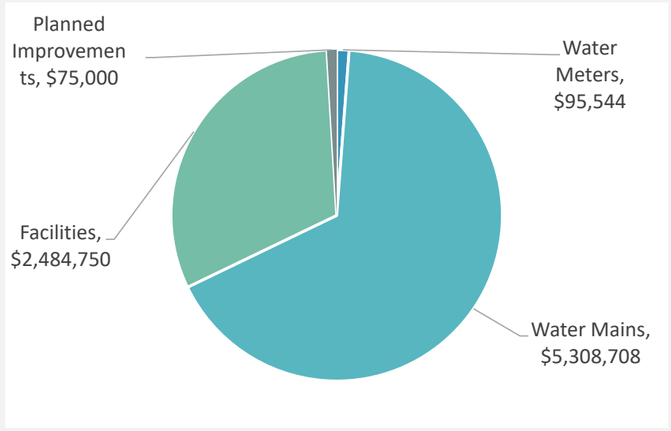
Watermain 7.5 km

Pumps 2

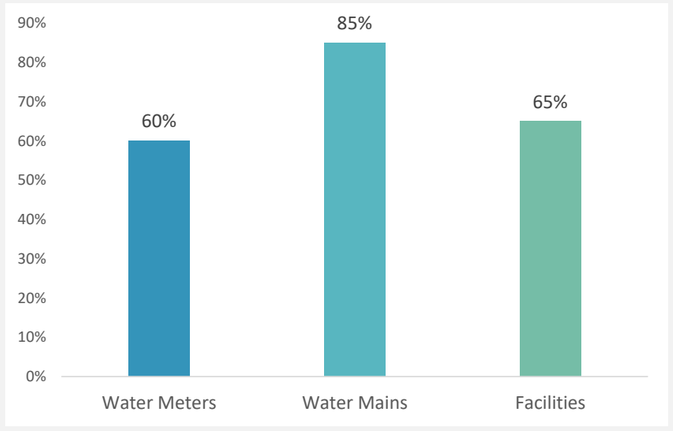
Reservoirs 1

PRVs 1

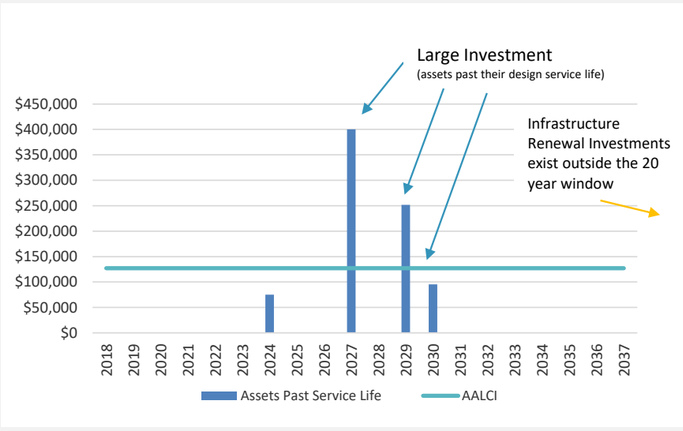
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$95,544	60%	$4,777	$4,777
Water Mains	***Diameter (mm)***				
250	***250***	$220,919	89%	$0	$2,763
200	200	$3,178,960	88%	$0	$31,309
150	150	$1,882,382	80%	$0	$24,868
<150	<150	$26,445	89%	$0	$264
		$5,308,708	**85%**	**$0**	**$59,204**
Facilities					
Manholes, Sampling, Chlorination		$91,750	41%	$3,838	$3,370
PRV		$75,000	36%	$3,750	$3,000
RESERVOIR		$918,000	80%	$0	$11,475
PUMP HOUSE		$900,000	68%	$0	$22,500
WELL		$500,000	40%	$25,000	$20,000
		$2,484,750	**65%**	**$32,588**	**$60,345**
Total without Planned Improvements		$7,889,002	78%	$37,365	$124,326
Planned Improvements					
Planned Back-up Generator (1)		$75,000	0%	$3,750	$3,000
Subtotal		**$7,964,002**	**78%**	**$41,115**	**$127,326**

WATER SYSTEMS – WESTSHORE

What assets do we own?

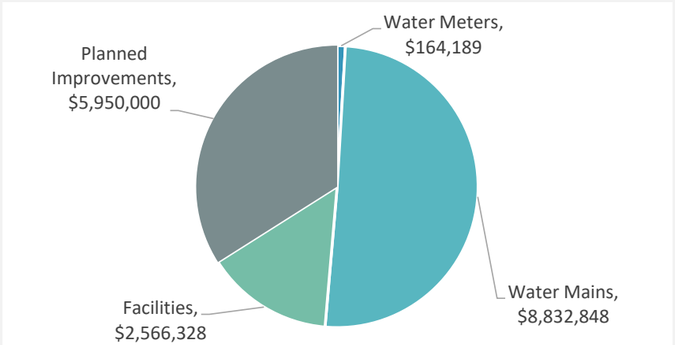
Watermain 14.5 km

Pumps 2

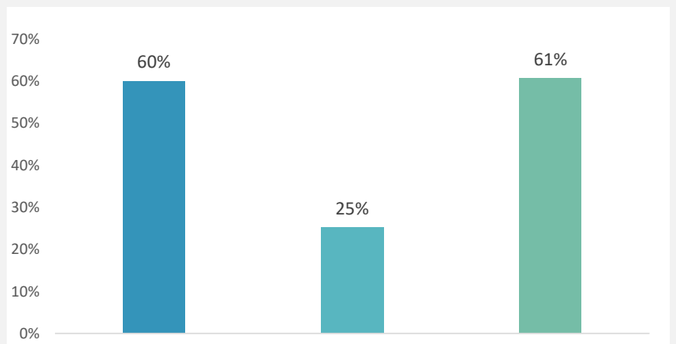
Reservoirs 2

PRVs 3

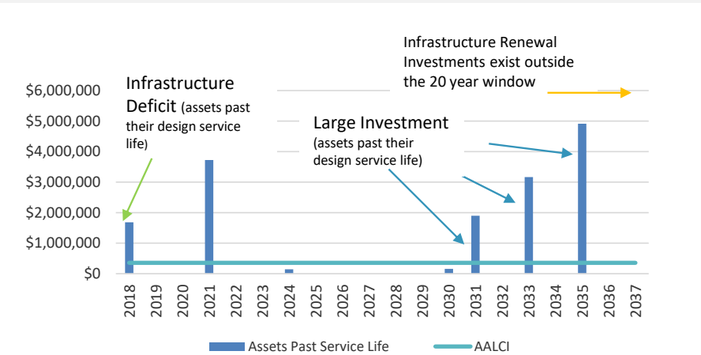
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$164,189	60%	$8,209	$8,209
Water Mains	***Diameter (mm)***				
450	450	$0	0%	$0	$0
400	400	$0	0%	$0	$0
350	350	$0	0%	$0	$0
300	300	$28,507	28%	$1,425	$475
250	250	$1,206,429	28%	$60,321	$20,107
200	200	$1,395,696	27%	$69,671	$23,262
150	150	$5,148,691	27%	$257,435	$85,812
<150	<150	$1,053,525	11%	$50,486	$23,183
		$8,832,848	**25%**	**$439,338**	**$152,838**
Facilities					
Reservoirs		$1,441,328	99%	$0	$18,017
Intake		$300,000	0%	$15,000	$7,500
Pumphouse		$600,000	0%	$30,000	$15,000
PRV's		$225,000	59%	$3,750	$6,429
		$2,566,328	**61%**	**$48,750**	**$46,945**
Total without Planned Improvements		$11,563,365	34%	$496,298	$207,993
Planned Improvements					
Back-up Generator (2)		$150,000	0%	$7,500	$6,000
Treatment		$5,800,000	0%	$290,000	$145,000
		$5,950,000	**0%**	**$297,500**	**$151,000**
Grand Total		$17,513,365	22%	$793,798	$358,993

WATER SYSTEMS – FINTRY

What assets do we own?

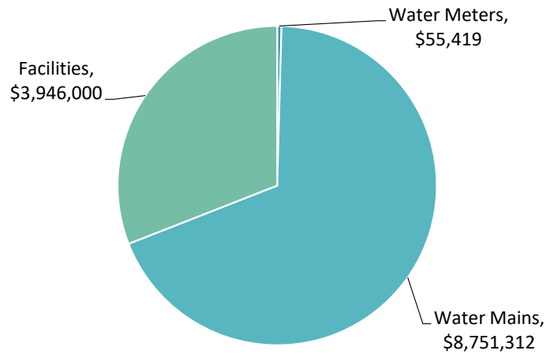
Watermain 11.6 km

Pumps 3

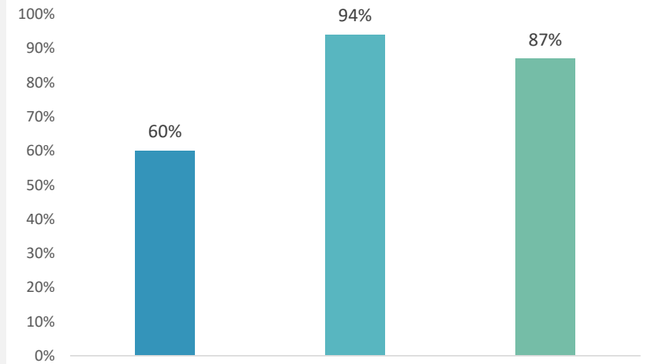
Reservoirs 2

PRVs 2

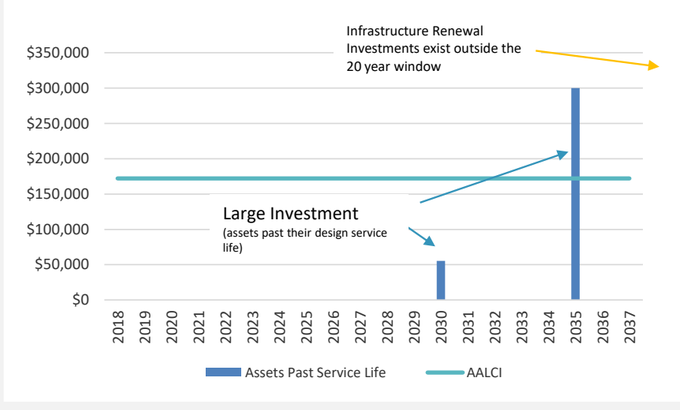
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$55,419	60%	$2,771	**$2,771**
Water Mains	***Diameter (mm)***				
>= 600	>= 600	$0	0%	$0	$0
500	500	$0	0%	$0	$0
450	450	$0	0%	$0	$0
400	400	$0	0%	$0	$0
350	350	$0	0%	$0	$0
300	300	$3,822,416	94%	$0	$38,224
250	250	$902,138	94%	$0	$9,021
200	200	$1,884,976	94%	$0	$18,850
150	150	$1,709,334	94%	$0	$17,093
<150	<150	$432,448	94%	$0	$4,324
		$8,751,312	**94%**	**$0**	**$87,513**
Facilities					
PRESSURE REDUCING		$150,000	**83%**	$0	$4,286
PUMP HOUSE		$1,750,000	**85%**	$0	$43,750
RESERVOIR		$1,746,000	**93%**	$0	$21,825
WELL		$300,000	**68%**	$15,000	$12,000
		$3,946,000	**87%**	**$15,000**	**$81,861**
Total		**$12,752,730**	**92%**	**$17,771**	**$172,145**

WATER SYSTEMS – STAR PLACE

What assets do we own?

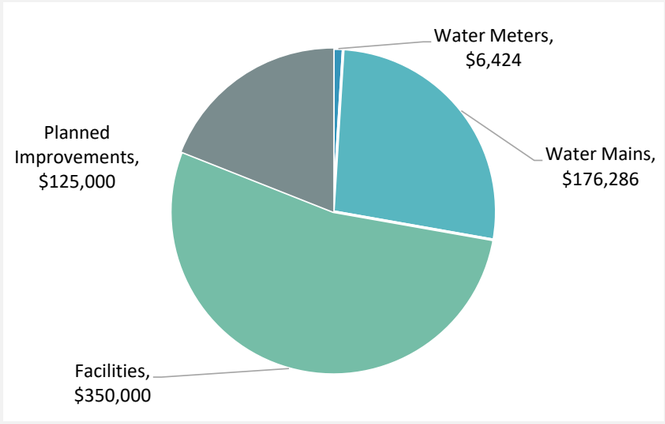
Watermain 300m

Pumps 1

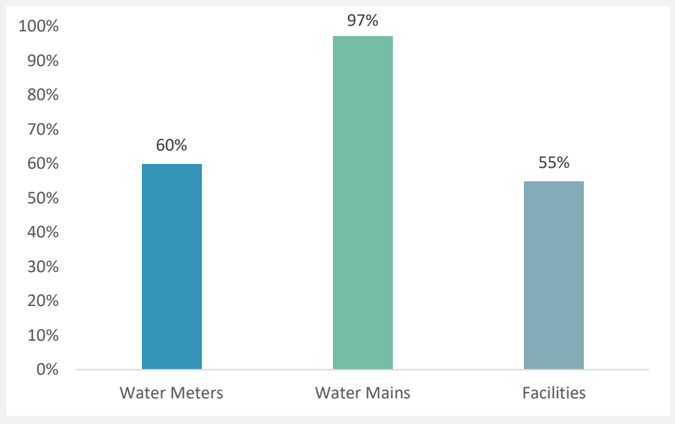
Reservoirs 1

PRVs 0

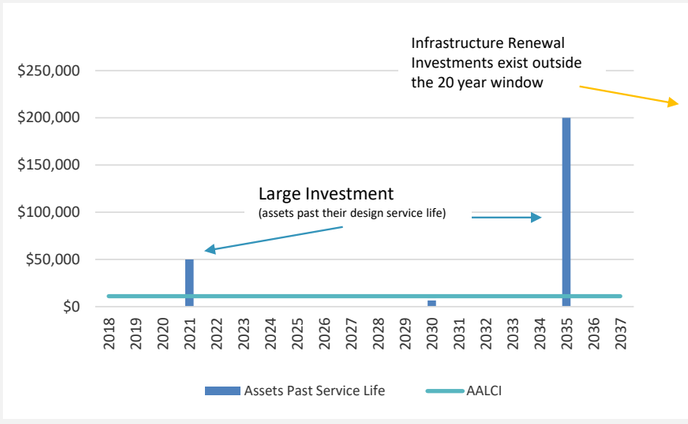
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$6,424	60%	$321	$321
Water Mains	***Diameter (mm)***				
300	300	$0	0%	$0	$0
250	250	$0	0%	$0	$0
200	200	$0	0%	$0	$0
150	150	$0	0%	$0	$0
<150	<150	$176,286	97%	$0	$2,518
		$176,286	**97%**	**$0**	**$2,518**
Facilities					
Reservoir and Pumphouse		$350,000	55%	$10,000	$6,875
Total without Planned Improvements		**$532,710**	**69%**	**$10,321**	**$9,715**
Planned Improvements					
Back-up Generator (1)		$75,000	0%	$3,750	$3,000
Treatment (UV/Filtration)		$50,000	0%	$2,500	$1,250
		$125,000	**0%**	**$6,250**	**$4,250**
Grand Total		**$657,710**	**56%**	**$16,571**	**$13,965**

SANITARY SYSTEM – COLLECTION SYSTEM

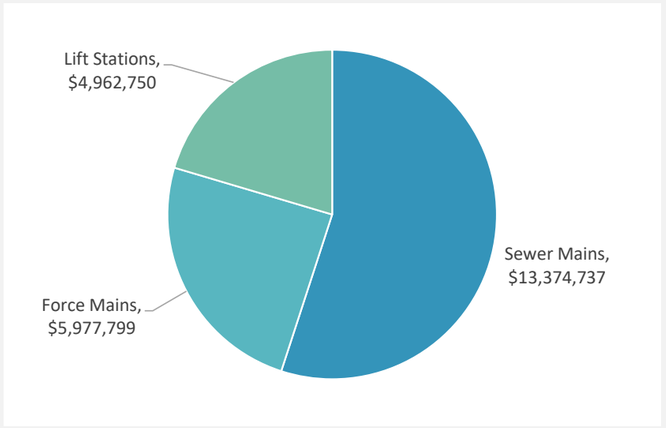
What assets do we own?

Mains
19.4 km

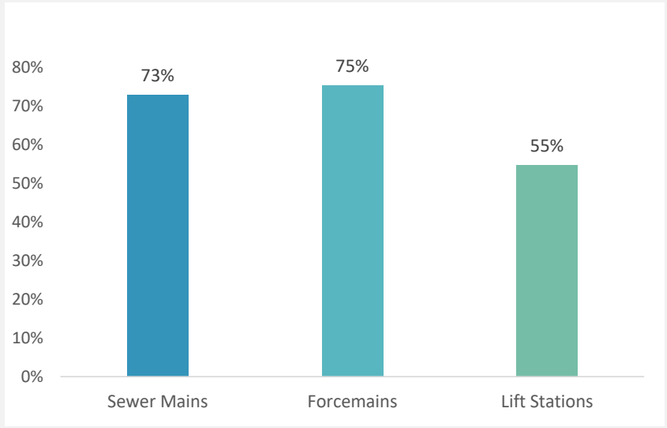
Forcemains
9.9 km

Lift Stations
2

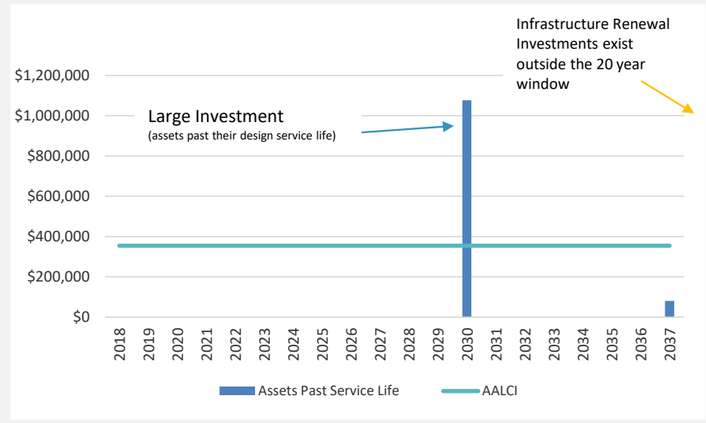
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Gravity Mains					
Sewer Mains	***Diameter***				
>= 600	*>= 600*	$4,737,861	69%	$0	$51,888
525	*525*	$1,099,013	73%	$0	$11,699
450	*450*	$1,682,214	70%	$0	$18,159
375	*375*	$3,978,158	77%	$0	$40,546
300	*300*	$1,005,316	79%	$0	$10,772
250	*250*	$276,116	74%	$0	$2,761
200	*200*	$596,058	76%	$0	$5,961
		$13,374,737	**73%**	**$0**	**$141,785**
Forcemains		**$ 5,977,799**	**75%**	**$ 0**	**$75,698**
Lift Stations					
Casa Loma		$1,944,000	58%	$43,200	$56,700
East Trunk		$3,018,750	53%	$14,688	$80,625
		$4,962,750	**55%**	**$57,888**	**$137,325**

SANITARY SYSTEM – SUNSET SANITARY SYSTEM

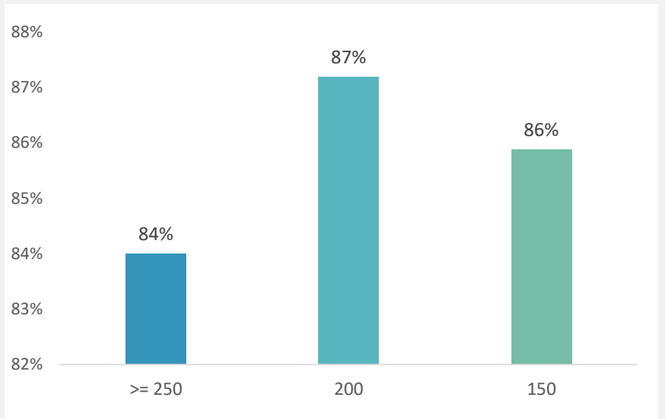
What assets do we own?

Mains

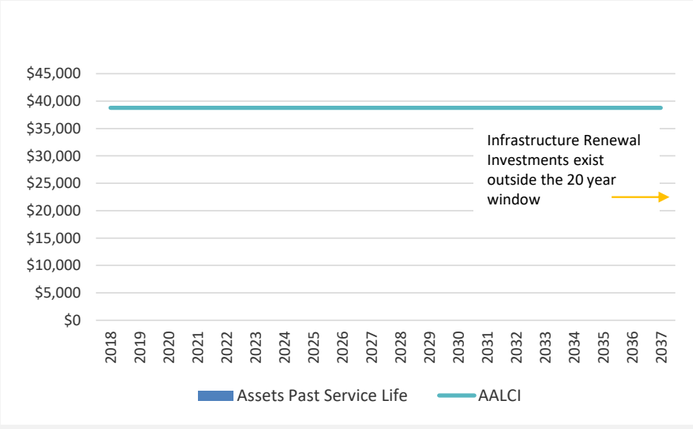
7.5 km

How much are our assets worth?

How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Sunset Sanitary System					
	Diameter				
>= 250	*>= 250*	$711,731	84%	$0	$7,117
200	*200*	$3,114,329	87%	$0	$31,215
150	*150*	$46,585	86%	$0	$466
		$3,872,645	**87%**	**$0**	**$38,798**

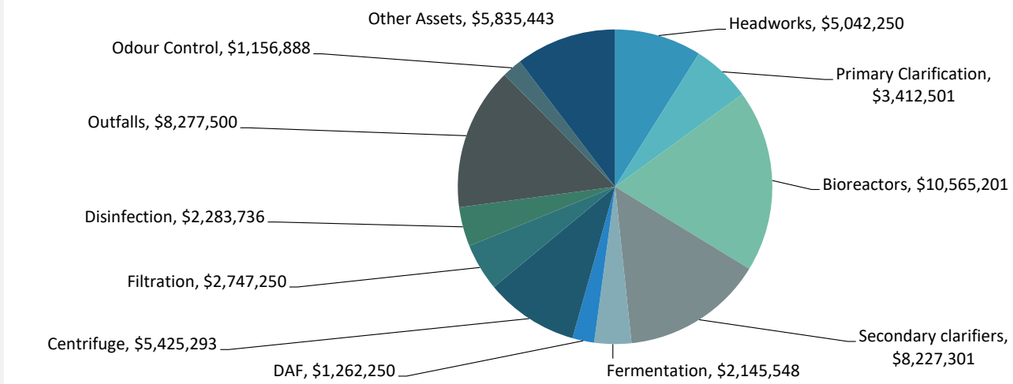
SANITARY SYSTEM - WWTP

What assets do we own?

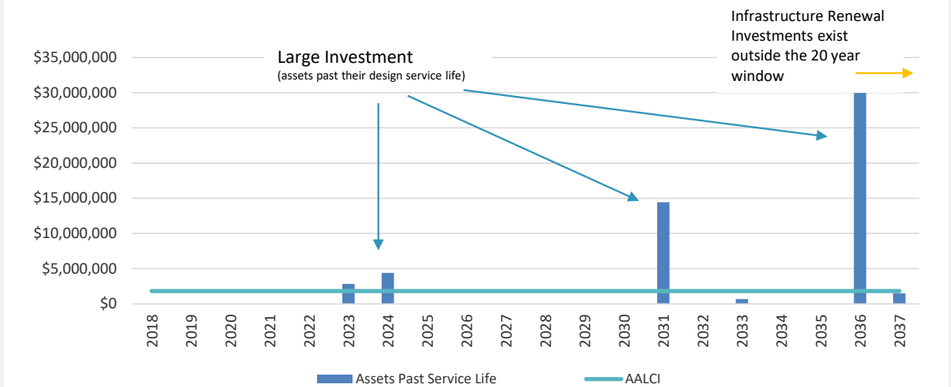
Treatment

1

How much are our assets worth?



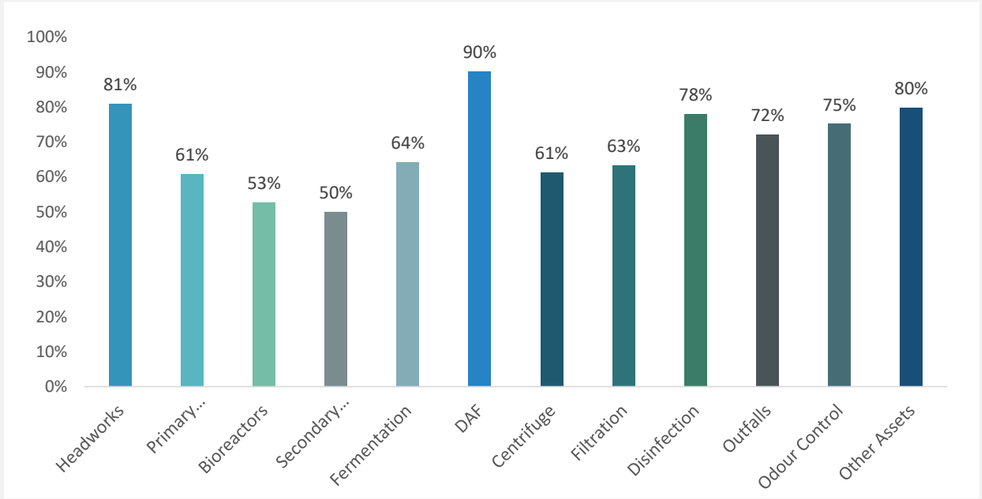
When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Treatment					
Headworks		$5,042,250	81%	$139,050	$167,316
Primary Clarification		$3,412,501	61%	$38,813	$71,766
Bioreactors		$10,565,201	53%	$364,500	$405,440
Secondary clarifiers		$8,227,301	50%	$292,941	$322,547
Fermentation		$2,145,548	64%	$54,290	$67,537
DAF		$1,262,250	90%	$33,750	$41,091
Centrifuge		$5,425,293	61%	$162,000	$189,316
Filtration		$2,747,250	63%	$108,000	$115,341
Disinfection		$2,283,736	78%	$78,689	$87,563
Outfalls		$8,277,500	72%	$77,625	$161,688
Odour Control		$1,156,888	75%	$57,237	$57,389
Other Assets		$5,835,443	80%	$91,905	$141,872
		$56,381,162	**65%**	**$1,498,799**	**$1,828,863**

How much life is left in our assets?



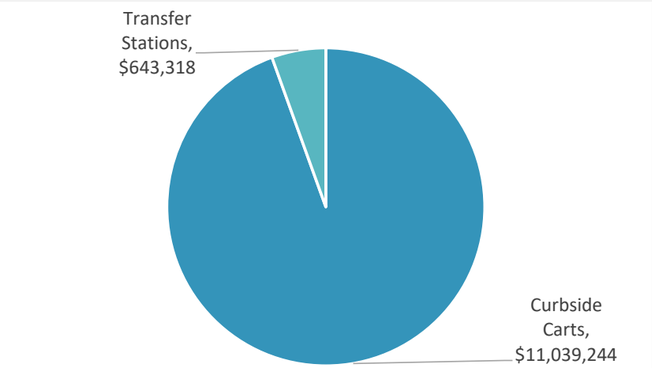
SOLID WASTE SYSTEM

What assets do we own?

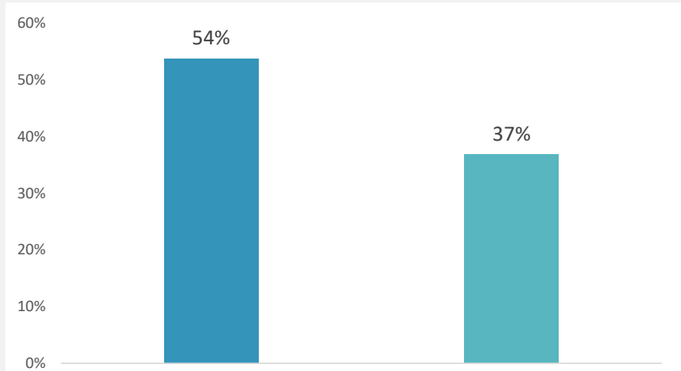
Curbside Carts
178,532

Transfer Stations
3

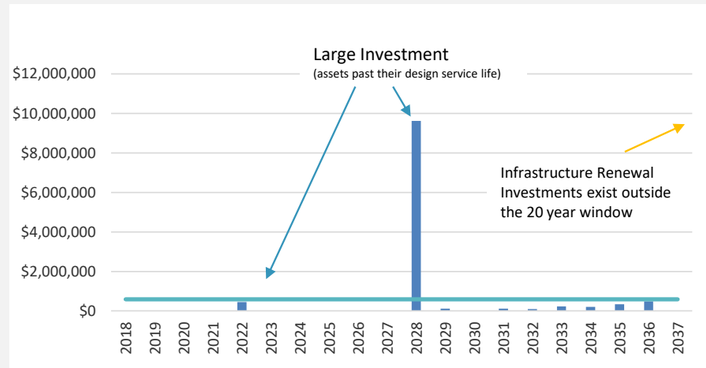
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Curbside Carts					
Kelowna	120L	$ 2,064,480	54%	$ 103,224	$ 103,224
	240L	$ 4,300,956	51%	$ 215,048	$ 215,048
	360L	$ 897,450	69%	$ 44,873	$ 44,873
	Sub-Total	**$ 7,262,886**	**54%**	**$ 363,144**	**$ 363,144**
West Kelowna	120L	$ 547,740	50%	$ 27,387	$ 27,387
	240L	$ 1,312,344	52%	$ 65,617	$ 65,617
	360L	$ 229,125	68%	$ 11,456	$ 11,456
	Sub-Total	**$ 2,089,209**	**53%**	**$ 104,460**	**$ 104,460**
Lake Country	120L	$ 221,799	50%	$ 11,090	$ 11,090
	240L	$ 552,354	54%	$ 27,618	$ 27,618
	360L	$ 125,400	71%	$ 6,270	$ 6,270
	Sub-Total	**$ 899,553**	**55%**	**$ 44,978**	**$ 44,978**
Peachland	120L	$ 133,518	50%	$ 6,676	$ 6,676
	240L	$ 315,678	50%	$ 15,784	$ 15,784
	360L	$ 25,800	50%	$ 1,290	$ 1,290
	Sub-Total	**$ 474,996**	**50%**	**$ 23,750**	**$ 23,750**
RDCO	120L	$ 89,709	52%	$ 4,485	$ 4,485
	240L	$ 206,316	51%	$ 10,316	$ 10,316
	360L	$ 16,575	50%	$ 829	$ 829
	Sub-Total	**$ 312,600**	**51%**	**$ 15,630**	**$ 15,630**
	Total	**$ 11,039,244**	**54%**	**$ 551,962**	**$ 551,962**

Transfer Stations					
092 WESTSIDE TRANSFER STATION		$568,304	31%	$28,415	$29,115
093 WESTSIDE LANDFILL		$25,000	77%	$0	$250
095 SOLID WASTE COLLECTION		$50,014	80%	$2,501	$2,501
	Sub-Total	**$ 643,318**	**37%**	**$30,916**	**$31,866**

MOVING FORWARD

Based on the results of the AMIP, the previously completed assessment of current practices, and the process outlined in the Asset Management for Sustainable Service Delivery, A BC Framework, the following section outlines a matrix with a list of steps (tools) and priorities for consideration of an advanced level of practicing asset management.

The steps outlined below are organized deliberately in order to promote successful implementation and improve understanding in the three pillars that inform infrastructure decisions – Cost, Risk and Service.

Number	Priority Name	BC Asset Management Framework Process	Description
1	Cross-Functional Team	People	Create a collaborative cross functional team made up of core departmental representatives to support and mentor on infrastructure decision-making and budgeting within the RDCO and their respective departments.
2	Asset Management/Financial Policy	Plan	Develop an asset management policy that encompasses procedures for data handling/tracking/updating and sharing, project prioritization, risk, and infrastructure investment decisions. The policy could include statements on how infrastructure investment will be funded whether it's through building reserves, debt or taxes, etc.
3	Setting Annual Infrastructure Investment Levels and Update Water and Sewer Rates	Plan	Consider the results of the AMIP, DCC and policy discussions to determine the affordable annual contribution to infrastructure investment (likely somewhere between the AAI and the AALCI amounts depending on risk tolerance and service levels). Update the water and sewer rate bylaws to increase revenues to achieve the desired investment levels for renewal.
5	Maintenance Management Plans	Implement Asset Management Practices	The importance of maintenance in extending service lives of assets and deferring their inevitable replacement (reducing the annual capital investment) is paramount to provide acceptable levels of service with fewer financial resources. Develop plans (including work orders, standard operating procedures, etc) for the O&M of assets to optimize/extend asset service lives.
6	Communications/ Engagement	Core Element	Develop asset management/infrastructure communications with staff and the public (e.g. benefits, requirements, products, progress). Community buy-in will be essential for setting levels of service and achieving financial sustainability/full cost recovery for service delivery.
7	Performance Measures	Measure and Report	Develop performance metrics to measure and report out on the RDCO's service delivery/asset management status to the Board and the community. These would include a set of both "leading" and "lagging" indicators that evaluate the sustainability of services (E.g. number of m of pipe replaced, number of m^2 of pavement replaced or avoided etc).
8	Refine Asset Inventory	Information	Continually update and refine your infrastructure data over time with new spatial and attribute data to improve accuracy as it becomes available through field activities. Consider completing an inventory and valuation of your natural Assets.

APPENDIX A

AMIP LEVEL 1

RDCO
Asset Management Investment Plan (AMIP)
Level 1 - Summary of Water, Sanitary and Solid Waste Infrastructure

Asset Category	Total Replacement Value	Loss in Value	Remaining Value	Expected Remaining Life	Infrastructure Deficit (Backlog)	2018	2019	2020	2021	2022	2023	2024
Domestic Water Systems												
Fintry Water System Renewal												
Water Meters	$55,419	$22,168	$33,251	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$8,751,312	$525,079	$8,226,233	94%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$3,946,000	$515,164	$3,430,836	87%	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$12,752,730**	**$1,062,410**	**$11,690,320**	**92%**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Star Place Water System Renewal												
Water Meters	$6,424	$2,569	$3,854	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$176,286	$4,961	$171,325	97%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$350,000	$158,125	$191,875	55%	$0	$0	$0	$0	$0	$0	$0	$0
Planned Improvements	*$125,000*	$0	$0	0%	$0	$0	$0	$0	$50,000	$0	$0	$75,000
Total	**$657,710**	**$165,655**	**$367,054**	**56%**	**$0**	**$0**	**$0**	**$0**	**$50,000**	**$0**	**$0**	**$75,000**
Sunset Ranch Water System Renewal												
Water Meters	$95,544	$38,218	$57,326	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$5,308,708	$800,116	$4,508,592	85%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$2,484,750	$870,380	$1,614,370	65%	$0	$0	$0	$0	$0	$0	$0	$0
Planned Improvements	*$75,000*	$0	$0	0%	$0	$0	$0	$0	$0	$0	$0	$75,000
Total	**$7,964,002**	**$1,708,714**	**$6,180,288**	**78%**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Killiney Water System Renewal + Treatment												
Water Meters	$217,859	$87,144	$130,715	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$9,383,961	$4,596,354	$4,787,607	51%	$0	$0	$0	$478,593	$0	$0	$2,264,210	$0
Facilities	$3,647,035	$1,133,553	$2,513,482	69%	$0	$450,000	$0	$2,392,964	$0	$0	$13,121,049	
Planned Improvements	*$6,025,000*	*$0*	*$0*	0%	$0	$0	$0	$3,900,000	$0	$0	$0	$225,000
Total	**$19,273,855**	**$5,817,051**	**$7,431,804**	**39%**	**$0**	**$450,000**	**$0**	**$6,771,556**	**$0**	**$0**	**$15,385,259**	**$225,000**
Westshore Water System Renewal + Treatment												
Water Meters	$164,189	$65,676	$98,513	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$8,832,848	$6,610,130	$2,222,718	25%	$709,901	$0	$0	$0	$0	$0	$0	$0
Facilities	$2,566,328	$1,010,159	$1,556,169	61%	$975,000	$0	$0	$0	$0	$0	$0	$150,000
Planned Improvements	*$5,950,000*	$0	$0	0%	$0	$0	$0	$3,900,000	$0	$0	$0	$0
Total	**$17,513,365**	**$7,685,965**	**$3,877,401**	**22%**	**$1,684,901**	**$0**	**$0**	**$3,900,000**	**$0**	**$0**	**$0**	**$150,000**
Falcon Ridge Water System Renewal												
Water Meters	$31,374	$12,549	$18,824	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$2,278,668	$720,306	$1,558,362	68%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$1,746,300	$421,016	$1,325,284	84%	$165,000	$0	$0	$0	$0	$0	$0	$0
Planned Improvements	*$150,000*	$0	$0	0%	$0	$0	$0	$0	$0	$0	$0	$150,000
Total	**$4,206,342**	**$1,153,872**	**$2,902,470**	**69%**	**$165,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$150,000**
Total Water	**$62,368,004**	**$17,593,667**	**$32,449,337**	**52%**	**$1,849,901**	**$450,000**	**$0**	**$10,671,556**	**$50,000**	**$0**	**$15,385,259**	**$600,000**
Sanitary Sewer												
Sanitary Sewer System Renewal												
Sewer Mains	$13,374,737	$3,624,483	$9,750,254	73%	$0	$0	$0	$0	$0	$0	$0	$0
Force Mains	$5,977,799	$1,481,081	$4,496,718	75%	$0	$0	$0	$0	$0	$0	$0	$0
Lift Stations	$4,962,750	$2,247,775	$2,714,975	55%	$850,000	$0	$0	$0	$0	$0	$0	$0
Sunset Ranch Sewer Mains	$3,872,645	$519,322	$3,353,323	87%	$0	$0	$0	$0	$0	$0	$0	$0
Treatment	$56,381,162	$19,694,125	$36,687,036	65%	$7,636,441	$0	$0	$0	$0	$0	$0	$0
Total	**$84,569,093**	**$27,566,787**	**$57,002,307**	**67%**	**$8,486,441**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Solid Waste												
Solid Waste Renewal												
Curbside Carts	$11,039,244	$5,102,825	$5,936,419	54%	$0	$0	$0	$0	$0	$0	$0	$0
Transfer Stations	$643,318	$406,612	$236,706	37%	$0	$13,997	$0	$0	$0	$451,247	$0	$0
Total	**$11,682,562**	**$5,509,438**	**$6,173,124**	**53%**	**$0**	**$13,997**	**$0**	**$0**	**$0**	**$451,247**	**$0**	**$0**

Investment Year (Current Dollars)													2017 Reserve Balances	20 Year Total	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037				
$0	$0	$0	$0	$0	$55,419	$0	$0	$0	$0	$0	$0	$0		$55,419	$2,771	$2,771
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$87,513
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$300,000	$0	$0		$300,000	$15,000	$81,861
$0	**$0**	**$0**	**$0**	**$0**	**$55,419**	**$0**	**$0**	**$0**	**$0**	**$300,000**	**$0**	**$0**	**$308,711**	**$355,419**	**$17,771**	**$172,145**
$0	$0	$0	$0	$0	$6,424	$0	$0	$0	$0	$0	$0	$0		$6,424	$321	$321
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$2,518
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200,000	$0	$0		$200,000	$10,000	$6,875
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$50,000	$6,250	$4,250
$0	**$0**	**$0**	**$0**	**$0**	**$6,424**	**$0**	**$0**	**$0**	**$0**	**$200,000**	**$0**	**$0**	**$2,890**	**$256,424**	**$16,571**	**$13,965**
$0	$0	$0	$0	$0	$95,544	$0	$0	$0	$0	$0	$0	$0		$95,544	$4,777	$4,777
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$59,204
$0	$0	$400,000	$0	$251,750	$0	$0	$0	$0	$0	$0	$0	$0		$651,750	$32,588	$60,345
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$3,750	$3,000
$0	**$0**	**$400,000**	**$0**	**$251,750**	**$95,544**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$328,697**	**$747,294**	**$41,115**	**$127,326**
$0	$0	$0	$0	$0	$217,859	$0	$0	$0	$0	$0	$0	$0		$217,859	$10,893	$10,893
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$2,742,803	$137,140	$93,840
$0	$0	$0	$0	$0	$217,859	$0	$0	$0	$0	$0	$0	$0		$16,406,872	$37,500	$65,836
$0	$0	$0	$0	$0	$0	$1,900,000	$0	$0	$0	$0	$0	$0		$0	$301,250	$154,000
$0	**$0**	**$0**	**$0**	**$0**	**$435,718**	**$1,900,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$321,550**	**$19,367,533**	**$486,783**	**$324,569**
$0	$0	$0	$0	$0	$164,189	$0	$0	$0	$0	$0	$0	$0		$164,189	$8,209	$8,209
$0	$0	$0	$0	$0	$0	$0	$0	$3,165,744	$0	$4,911,121	$0	$0		$8,786,766	$439,338	$152,838
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$2,100,000	$48,750	$46,945
$0	$0	$0	$0	$0	$0	$1,900,000	$0	$0	$0	$0	$0	$0	$0	$0	$297,500	$151,000
$0	**$0**	**$0**	**$0**	**$0**	**$164,189**	**$1,900,000**	**$0**	**$3,165,744**	**$0**	**$4,911,121**	**$0**	**$0**	**$893,280**	**$11,050,955**	**$793,798**	**$358,992**
$0	$0	$0	$0	$0	$31,374	$0	$0	$0	$0	$0	$0	$0		$31,374	$1,569	$1,569
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$24,838
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$10,750	$28,116
$0	$0	$0	$0	$50,000	$0	$0	$0	$0	$0	$0	$0	$0		$215,000	$7,500	$6,000
$0	**$0**	**$0**	**$0**	**$50,000**	**$31,374**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$6,512**	**$246,374**	**$19,819**	**$60,523**
$0	**$0**	**$400,000**	**$0**	**$301,750**	**$788,667**	**$3,800,000**	**$0**	**$3,165,744**	**$0**	**$5,411,121**	**$0**	**$0**		**$32,023,999**	**$1,375,856**	**$1,057,520**
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$452,119	$0	$0	$141,785
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$75,698
$0	$0	$0	$0	$0	$1,076,750	$0	$0	$0	$0	$0	$0	$81,000		$1,157,750	$57,888	$137,325
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$38,798
$2,830,441	$4,390,399	$0	$0	$0	$0	$0	$0	$14,443,692	$0	$675,000	$0	$0	$327,918	$29,975,973	$1,498,799	$1,828,863
$2,830,441	**$4,390,399**	**$0**	**$0**	**$0**	**$1,076,750**	**$0**	**$0**	**$14,443,692**	**$0**	**$675,000**	**$0**	**$81,000**	**$780,037**	**$31,133,723**	**$1,556,686**	**$2,222,469**
$0	$0	$0	$9,628,749	$114,750	$0	$114,099	$93,750	$218,700	$152,820	$237,540	$478,836	$0		$11,039,244	$551,962	$551,962
$0	$0	$0	$0	$0	$0	$0	$0	$4,060	$50,014	$99,000	$0	$0	$78,874	$618,318	$30,916	$31,866
$0	**$0**	**$0**	**$9,628,749**	**$114,750**	**$0**	**$114,099**	**$93,750**	**$222,760**	**$202,834**	**$336,540**	**$478,836**	**$0**	**$78,874**	**$11,657,562**	**$582,878**	**$583,828**

APPENDIX B

INPUTS

UNIT COST DERIVATION

The following is intended to outline how the unit costs included in the Asset Management Investment Plan were developed. The primary basis for most unit costs for the water and sewer assets is based on recently tendered projects in the Central Okanagan region.

Sanitary Sewer

Inputs

Pipe, Appurtenances (connection, manholes, services), road restoration, removals, engineering and contingency

In order to determine a per metre price, it was assumed a 100m long segment would include:

- 1 manhole (incl. 1m riser), 1 tie-in connection, 6 services
- 3.5m wide trench wide- asphalt removal, trench restoration, and asphalt restoration
- Soft Costs- engineering and contingency

Pipe

Per metre price:

Diameter (mm)	Unit Cost	Diameter (mm)	Unit Cost
200	$165	525	$410
250	$170	600	$500
300	$205	750	$640
350	$235	900	$790
375	$235	1050	$950
450	$320	1200	$1,350

Appurtenances

6 services (assume 10m long c/w IC) = (6 x $2,600ea) /100m = $156.00/m

1 Connection = (1 x $3,500 ea) /100m = $35.00/m

1 Manhole = (1 x $3,505 ea) /100m = 35.05/m

Total = $226.05/m

Road Restoration (3.5m wide trench per metre of pipe)

Asphalt (assume 75mm thick unit price)
$25.30m2 x 3.5m x 1m = $88.55 /m

Base gravel (assume 100m thick)
$51.28 m3 x 3.5m x 1m x 0.1m = $17.95/m

Total = $106.50/m

Removals (3.5m wide trench per metre of pipe)

Asphalt removal
$4.28 m2 x 3.5m x 1m = $14.98/m

Engineering & Contingency

Design - 7%, CA - 8%, Contingency – 20% = 35%

Total per m = Pipe cost per metre + $226.05 + $106.50 + $14.98 + 40%

Water

Inputs

Pipe, Appurtenances (connection, fittings, services), road restoration, removals, engineering and contingency

In order to determine a per metre price, it was assumed a 100m long segment would include:

- 4 fittings, 2 tie-in connections, 6 services
- 3.5m wide trench wide- asphalt removal, trench restoration, and asphalt restoration
- Soft Costs- engineering and contingency

Pipe

Per metre price:

Diameter (mm)	Unit Cost	Diameter (mm)	Unit Cost
50	$60	350	$250
100	$120	375	$325
150	$140	400	$420
200	$165	450	$470
250	$210	525	$510
300	$240	600	$600

Appurtenances

6 services (assume 10m long c/w IC) = (6 x $2,600 ea) /100m= $156.00/m

2 Connections = (2 x $3,000 ea)/100m = $60.00/m

4 Fittings = (4 x $750 ea) /100m = $30.00/m

Total = $246.00/m

Road Restoration (3.5m wide trench per metre of pipe.)

- Asphalt (assume 75mm thick unit price)
  $25.30m2 x 3.5m x 1m = $88.55 /m
- Base gravel (assume 100m thick)
  $51.28 m3 x 3.5m x 1m x 0.1m = $17.95/m

Total = $106.50/m

Removals (3.5m wide trench per metre of pipe).

- Asphalt removal
  $4.28 m2 x 3.5m x 1m = $14.98/m

Engineering & Contingency

Design -7%, CA-8%, Contingency – 20% = 35%

Total per m = Pipe cost per metre + $246.00 + $106.50 + $14.98 + 40%

APPENDIX B

Service Life Estimates

The service life of an asset such as a pipe depends on many factors such as the materials it is constructed from, the properties of the soils that it is buried in, how it was installed and many, many other factors. For this reason, lifespan estimates are generally based on “rule of thumb” values. Most rule of thumb lifespans applied by engineers are conservative (on the safe side). In reality many assets could actually last much longer (50% longer or possibly more) than these estimates. The following tables summarize the “rule of thumb” values utilized in the AMIP.

The unit costs and service life estimates for the WWTP have been provided under separate cover. Unit costs for solid waste and other assets not included above will be based on historical cost (from invoices or TCA spreadsheets) and increased to 2017 dollars using the Engineering News record (ENR) cost increase factors.

Sanitary Sewer System	
Pipe Material	Life Expectancy (years)
AC	70
CONC	70
VCT	70
STEEL	70
PVC/HDPE	100
Component	
Pump Stations – Short lived	25
Pump Stations – Long Lived	80

Water Distribution System	
Pipe Material	Life Expectancy (years)
AC	80
CI	80
DI	60
COPPER	60
GALV	40
STEEL	60
Polyethylene	80
HDPE	80
PVC	100
Component	
Wells/Pumps/Treatment	25
Reservoirs	80
Flow Meters	30
Appurtenances	20

Governance & Services Committee Report

TO: Governance & Services Committee

FROM: David Komaike
Director of Engineering

DATE: May 1, 2019

SUBJECT: Central Okanagan East Sewer Systems Bylaw Fees (Sunset Ranch)

Purpose: To provide the Committee an update on the East Sewer System User Fees Review (Sunset Ranch) and recommend amendments to the RDCO Central Okanagan East Sewer Systems Bylaw No. 1216.

Executive Summary:

The Regional District of Central Okanagan (RDCO) Central Okanagan East Sewer Systems Bylaw No. 1216, as amended, regulates the fees and charges of the Sunset Ranch community sewer system. The last review update to the fees occurred in 2015 and the fees have not changed since January 1, 2016.

The current RDCO fee structure for a residential connection is composed of a base User Fee and an Asset Renewal Fee. The commercial connection has a similar fee structure but also includes a "metered" fee based upon the volume of water used by the customer.

The User Fees are intended to cover all annual operational costs of the sewer system. The Asset Renewal Fees apply to all lots within the service area and are intended to fund capital reserves that will be utilized on capital projects.

This review's focus is to update both the User and Asset Renewal fees to ensure operating cost recovery and the long term financial viability of the utility.

RECOMMENDATION:

THAT the Governance & Services Committee receives for information the Central Okanagan East Sewer System Fees report, and recommends the Regional Board give consideration and approve Regional District of Central Okanagan Central Okanagan East Sewer Systems Amendment Bylaw No. 1441.

Respectfully Submitted:

David Komaike
Director of Engineering

Approved for Committee's Consideration

Brian Reardon, CAO

Prepared by: Clarke Kruiswyk, Environmental Services Analyst

Implications of Recommendation:

Financial: Accountability and sustainability

Background:

The Regional District of Central Okanagan (RDCO) Central Okanagan East Sewer Systems Bylaw No. 1216, as amended by Bylaw No. 1378, regulates the fees and charges of the Sunset Ranch community sewer system, which includes approximately 270 residential connections and one commercial connection (Sunset Ranch Golf Course Clubhouse).

The Sunset Ranch sewer system is primarily comprised of piping and is connected to the City of Kelowna sewer trunk system and wastewater treatment plant. As a result, the City of Kelowna charges the Regional District a connection fee and flow-based fees for the commercial connection and simply a connection fee for the residential connections. Overall, the City of Kelowna expenses makes up approximately 70% of the Sunset Ranch operating expenses.

The current RDCO fee structure is consistent with those charged by the City of Kelowna. For a residential connection the current RDCO sewer fees are composed of a base User fee and an Asset Renewal fee. The commercial connection has the similar fee structure with the addition of a metered rate. The User fees are intended to cover all annual operational costs of the sewer system. The Asset Renewal fees apply to all lots within the service area and are intended to fund capital reserves that will be utilized on capital projects.

The last review updated the fees effective January 1, 2016 and fees have not changed since 2016. This review's focus is to update both the User and Asset Renewal fees.

Asset Management Investment Plan

The Regional District engaged a third party consultant, Urban Systems, to update our Asset Management Investment Plan ("AMIP") which forecasts the asset renewal needs for the Regional District Environmental Services Department. The previous AMIP was completed in 2012 and the update accounts for changes in infrastructure and in construction costs. The AMIP outlines the following:

- Current replacement value;
- Remaining value;
- Expected life remaining;
- Required improvements;
- Infrastructure deficit;
- 20 year Average Annual Investment ("AAI"); and
- Average Annual Life Cycle Investment ("AALCI").

The AMIP is included in Appendix A and outlines that the Regional District Environmental Service Department owns infrastructure with a replacement value of approximately $159 million in water systems, sanitary systems, and solid waste assets. The table below summarizes the results for the Sunset Ranch sewer system:

Sewer System	100% Replacement Value	Expected Remaining Life	Infrastructure Deficit (Backlog)	20 Year Average Annual Investment (AAI)	Average Annual Life Cycle Investment (AALCI)
Sunset Ranch	$ 3,872,645	87%	$ -	$ -	$ 38,798

It is recommended that the AALCI be used to establish investment levels as it accounts for all assets and not just those that require replacing in the 20 year time horizon; however, the AAI should be considered if significant funds are required in the near term for immediate improvements.

The Asset Renewal reserve levels for the sewer system as of December 31, 2018 and projected to December 31, 2019 are listed in the table below:

Sewer System	Equipment and Capital Facility Reserves	
	2018 (actual)	2019 (projected)
Sunset Ranch	$ 100,861.00	$ 116,869.00

A portion of these reserve balances should be held for equipment replacements not included in the AMIP review (i.e., vehicle replacement, other minor replacements) but the remainder of the current reserves can be used to partially offset the required annual replacement costs.

The table below summarizes the 2019 budgeted Asset Renewal revenue against the annual investment contribution at different funding levels and accounts for the current available reserve balance:

Sewer System	Budgeted 2019 Asset Renewal	Annual Replacement Cost at:		
		100%	75%	50%
Sunset Ranch	$ 28,814.00	$ 33,798	$ 25,349	$ 16,899

Based on the AMIP and the current reserve levels, the Asset Renewal fees could be adjusted as outlined in the table below for various annual replacement cost funding ratios:

Sewer System - Replacement Ratio	Asset Renewal Fee Alternatives			
	Quarterly	Annual	Annual Change	Adjustment
Sunset Ranch - Current	$ 26.10	$ 104.40	$ -	0.0%
Sunset Ranch - 50%	$ 15.00	$ 60.00	$ (44.40)	-42.5%
Sunset Ranch - 75%	$ 23.00	$ 92.00	$ (12.40)	-11.9%
Sunset Ranch - 100%	$ 31.00	$ 124.00	$ 19.60	18.8%

Maintaining the current Asset Renewal fees would bring the funding replacement costs ratio to approximately 85% which is more sustainable over the long term.

User Fees

As outlined above, the User fees are intended to fund the operation of the sewer system and the fees have not changed since 2016. It is proposed that the User fees are updated in conjunction with the proposed changes to the Asset Renewal fees. The User fees review has focused on bringing revenue in line with projected operating costs.

The operating costs over the past five years for the sewer system has shown variability in total annual costs. The projected costs were based on a weighted average of the actual historical costs for the past few years and the 2019 budget. This weighted average helps alleviate the annual variability in operating costs. These weighted costs were projected forward using an inflation factor to determine the required revenue and associated fees. Although the Sunset Ranch sewer system has experienced growth in the number of connections, the major operating cost is a fee per connection charged by the City of Kelowna, so there have been limited benefits of the additional connections on the User fee per connection that would be expected due to the increased economies of scale.

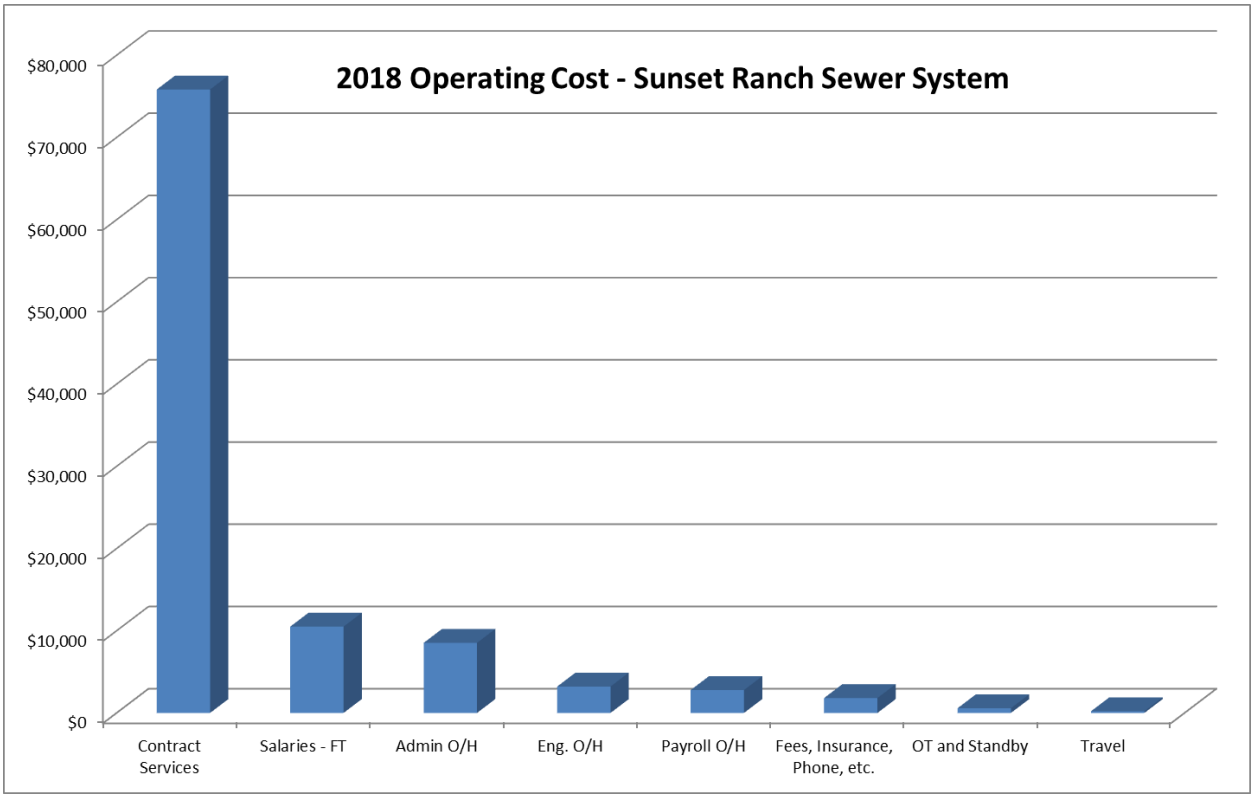
The analysis suggests that the following rate adjustments to the basic User fees are warranted:

Sewer System	Current Rate		Calculated Adjustment			
	Quarterly	Annual	Quarterly	Annual	Annual Change	Adjustment
Sunset Ranch - Residential	$ 87.15	$ 348.60	$ 94.00	$ 376.00	$ 27.40	7.9%
Sunset Ranch - Commercial	$ 36.00	$ 144.00	$ 39.00	$ 156.00	$ 12.00	8.3%

The Sunset Ranch Commercial flow-based fee of $2.20 / M^3 is not proposed to be change at this time.

Breakdown of Operating Costs

The figure below itemizes the 2018 cost of operating the Sunset Ranch sewer system and highlights that the major cost of operating is Contract Services (i.e., City of Kelowna charges). Sewer line flushing costs are not shown in the 2018 costs but typically represent approximately 6% of the annual operating costs.



Resident Communication

If the fee changes are approved, the residents will be informed of the actual fee changes in conjunction with the changes to the water fees. Residents would receive their third quarter invoices reflecting the new fees in the Fall of 2019.

Recommendation

The fees are recommended to change as outlined in the table below for the Sunset Ranch Sewer System. The adjustments are necessary to fund the sewer system's operation and capital reserve contributions. Please note that as the fees are proposed to be implemented mid-year 2019 the annual impact of the change will be spread over two years as can be seen in the "Annual Change" figures in the table.

For illustrative purposes, the Sunset Ranch – Commercial User metered fee is based on the 2018 average metered flow and has been included to show total costs.

The recommended Asset Renewal fees are based on maintaining the current Asset Renewal fees which would bring the funding ratio to a more sustainable level of approximately 85%. Increasing the funding ratio without increasing the fees is currently possible partially due to development and the growth in the number of parcels in the service area.

The table also includes future rate adjustments to the User fee and Asset Renewal fee to account for future inflation. These adjustments are based on an inflation factor of 2% which is approximately equivalent to the current Consumer Price Index (CPI). These annual adjustments for inflation should reduce the need for larger increases at future rate reviews. Throughout the annual budget review process the revenue will be projected to determine if specific fees need to be adjusted in advance of the next rate review. The next major review is planned for 2022. It is intended that the ratio or margin of Regional District fees over the charged City of Kelowna fees to fund Regional District operation be equivalent over the different fee types (i.e., residential, commercial – basic and metered).

It is recommended that the Sunset Ranch Sewer System Bylaw be updated with the quarterly fees outlined in the table below for July, 2019 through to December 31, 2022.

Service Area	Fee Type	Current	2019	2020	2021	2022
		Jan, 2016	Jul, 2019 [2]	Jan, 2020	Jan, 2021	Jan, 2022
Sunset Ranch - Residential	User Fee	$ 87.15	$ 94.00	$ 96.00	$ 98.00	$ 100.00
	Asset Renewal Fee	$ 26.10	$ 26.10	$ 27.00	$ 28.00	$ 29.00
	Total	$ 113.25	$ 120.10	$ 123.00	$ 126.00	$ 129.00
	Annual Cost	$ 453.00	$ 466.70	$ 492.00	$ 504.00	$ 516.00
	Annual Change	N/A	$ 13.70	$ 25.30	$ 12.00	$ 12.00
Sunset Ranch - Commercial	User - Basic	$ 36.00	$ 39.00	$ 40.00	$ 41.00	$ 42.00
	User - Metered [1]	$ 945.40	$ 945.40	$ 945.40	$ 945.40	$ 945.40
	Asset Renewal Fee	$ 26.10	$ 26.10	$ 27.00	$ 28.00	$ 29.00
	Total	$ 1,007.50	$ 1,010.50	$ 1,012.40	$ 1,014.40	$ 1,016.40
	Annual Cost	$ 4,030.00	$ 4,036.00	$ 4,049.60	$ 4,057.60	$ 4,065.60
	Annual Change	N/A	$ 6.00	$ 13.60	$ 8.00	$ 8.00

[1] - *Based on 2018 annual average metered flow - Fee of $2.20/M* [3]

[2] - *Annual cost for 2019 based on July, 2019 effective date*

Attachment(s): Asset Management Investment Plan, Urban System 2018

Asset Management Investment Plan

(An Asset Renewal Forecast)

prepared for:
Regional District of Central Okanagan

NOVEMBER 2018

URBAN systems

TERMS AND DEFINITIONS

The following commonly used terms are defined as they relate to the Asset Management Investment Plan (AMIP).

ANNUAL AVERAGE LIFE CYCLE INVESTMENT (AALCI): Annual budget based on annual average of the total replacement value of an asset over its expected service life determined by the asset management plan

ASSET: A physical component of a system that has value, enables services to be provided, and has an economic life of greater than 12 months

ASSET CONDITION: The state of an asset, particularly regarding its appearance, quality, or working order

ASSET MANAGEMENT: The process of making decisions about the use and care of infrastructure to deliver services in a way that considers current and future needs, manages risks and opportunities, and makes the best use of resources

ASSET MANAGEMENT PLAN: A long term plan to identify asset management needs, establish longer term financing means, and regularly schedule maintenance, rehabilitation and replacement works for the long-term sustainability of the asset

ASSET MANAGEMENT POLICY: Principles and mandated requirements derived from, and consistent with, the organizational strategic plan, providing a framework for the development and implementation of the asset management strategy and the setting of the asset management objectives

ASSET MANAGEMENT STRATEGY: Long-term optimized approach to management of the assets, derived from, and consistent with, the organizational strategic plan and the asset management policy

ASSET RENEWAL: Work on an asset (or component) that brings the asset back to new condition or the complete replacement of the asset (in situ) with a new asset providing the original (intended) level of service

COST: In asset management, the financial and human resources required throughout the lifecycle of the asset

INFRASTRUCTURE RENEWAL DEFICIT (BACKLOG): A measure of the amount of infrastructure that has passed its theoretical service life but is still providing service to the community

LEVEL OF SERVICE: A measure of the quality, quantity, and/or reliability of a service from the perspective of residents, businesses, and customers in the community

LIFE CYCLE COSTS: The total costs estimated to be incurred in the design, construction, operation, maintenance, and final disposition of a physical asset or system over its anticipated useful life span

LIFE CYCLE MANAGEMENT: Retaining an asset as near as practicable to its original condition, from the point when a need for it is first established, through its design, construction, acquisition, operation and any maintenance or renewal, to its disposal

REVENUE: The income received by the RDCO from taxes, user fees, government transfers and other sources. Own sources revenues is income received from taxation, user fees, and any interest income.

RISK(S): Events or occurrences that will have an undesired impact on services (Risk = Impact x Likelihood)

Asset Risk – An event where an asset failing to perform as you need it to. Examples of asset risks are a broken sewer pipe or potholed road surface.

Strategic Risk – Events or occurrences that impact your ability to achieve objectives.

REGULATORY REQUIREMENT: Capital works to meet existing or new provincially or federally legislated standards.

SERVICE: A system that fulfills a public need such as transportation and sewage collection

SERVICE LIFE: The estimated lifespan of a depreciable fixed asset, during which it can be expected to contribute to a municipality's operations/service delivery

TANGIBLE CAPITAL ASSET (TCA): An Asset that has a physical form for use in the operations and delivery of services. Tangible assets include fixed assets, such as water, sewer, roadways and buildings (fixed assets are sometimes referred to as 'plant'). Tangible capital assets must be accounted for and reported as assets on the Statement of Financial Position as part of PS 3150.

TRIPLE BOTTOM LINE APPROACH: Utilizing economic, social and environmental metrics (i.e. quantifiable impacts to costs, mobility, and watercourses/habitats) in assessing and/or prioritizing investments.

USEFUL LIFE: The minimum life expectancy commonly used for asset life. This is typically used for TCA reporting (as opposed to for asset management purposes).

INVESTMENT LEVEL INDICATORS

ANNUAL AVERAGE LIFE CYCLE INVESTMENT (AALCI)

The Average Annual Life Cycle Investment (AALCI) is defined as the summation of each asset's annual depreciation. It represents the annual investment needed to sustain existing infrastructure over its service life (over the next 20 years and beyond).

Note: AALCI must be considered in conjunction with unfunded liability as this is a forward-looking parameter that does not consider the past.

20 YEAR AVERAGE ANNUAL INVESTMENT (20 YEAR AAI)

The 20 Year Average Annual Investment (20 Year AAI) is defined as the summation of expenditures over a 20 year planning horizon divided by 20. It represents the annual investment needed to pay for expected infrastructure replacements over the next 20 years (within the 20 year horizon).

INFRASTRUCTURE DEFICIT

Unfunded Liability is a measure of the amount of infrastructure that has passed its theoretical service life but still provides service to the community. This infrastructure should be inspected to determine if replacement is necessary or if replacement timing can be adjusted.

Note: The presented indicators do not take into account level of service, existing reserve balances, risk, all future capital needs (water treatment is included), or willingness to take on risk. Over time, as the community gathers more information and further develops their asset management system, these investment figures should be further refined and adjusted.

EXECUTIVE SUMMARY

The Regional District of Central Okanagan (RDCO) Environmental Services Department owns and maintains a large portfolio of infrastructure assets upon which it greatly relies for the delivery of services to the region. This infrastructure includes the ESD's water systems, sewer systems, solid waste assets as well as a wide variety of vehicles.

Some of the RDCO's assets, such as the Killiney Beach water system, date back to the 1960's while the sewer system is relatively young at 1990's. These assets, and others, have served the community well however many of these assets are now nearing the end of their useful lifespans and will eventually need to be replaced or rehabilitated.

The Asset Management Investment Plan (AMIP) provides a review of RDCO's Water, Sanitary, and Solid Waste assets to answer the following questions;

1. What assets does the RDCO own?
2. What is the forecasted cost to replace the asset?
3. How much money needs to be invested annually (on average) to sustain the RDCO's assets?

By understanding the answer to these questions, the RDCO will be able to budget and plan for the replacement of their infrastructure. Failure to plan would put the community at risk of service disruptions, emergency repairs and the need for sudden and significant tax and user fee increases.

By being proactive today the RDCO can ensure that services are sustainable so that current and future generations can enjoy the same levels of service as well as user fees and charges.

Table 1.1: 20 Year Average Annual Invesment and Average Annual Life Cycle Investment

Asset Category	20 Year Average Annual Investment (AAI)	Average Annual Life Cycle Investment (AALCI)
Killiney Water System	$486,783	$324,569
Falcon Ridge Water System	$19,819	$60,523
Star Place Water System	$16,571	$13,965
Sunset Ranch Water System	$41,115	$127,326
Westshore Water System	$793,798	$358,993
Fintry Water System	$17,771	$172,145
Sanitary Sewer System		
Westside Collection	$57,888	$354,808
Treatment	$1,498,799	$1,828,863
Sunset Sanitary	$0	$38,798
Solid Waste	$582,878	$583,828
Total	**$3,515,422**	**$3,863,818**

WHAT ASSETS DOES THE REGIONAL DISTRICT OWN?

For the purposes of the AMIP the RDCO's assets have been separated into 3 categories: water system, sanitary system, and solid waste.

The sanitary sewer is comprised of approximately 20km of sewer pipes in addition to manholes, lift stations, force mains and treatment facilities.

The water system is compromised of six separate water systems which include Killiney Beach, Falcon Ridge, Sunset Ranch, Westshore, Fintry and Star Place, each of which have a series of water pipes, reservoirs, pumps and treatment facilities.

The solid waste category includes the curbside carts and transfer stations.

All of these infrastructure assets are required to deliver the services that are valued by the residents of Central Okanagan.

WHAT IS THE COST TO REPLACE THE ASSETS?

The total replacement value of the RDCO's infrastructure is approximately $140 million, based on current construction costs. Broken down as follows:

Sanitary System $85M

Water Systems $62M

Solid Waste $12M

The water and sewer systems make up the majority of the infrastructure value (91%) with solid waste accounting for 9% of the total value. The Wastewater Treatment Plant is valued at $50M or 36% of the total infrastructure value.

HOW MUCH MONEY NEEDS TO BE INVESTED ANNUALLY?

There is no single "correct" answer to this question. Accurately predicting when infrastructure will need to be replaced is very difficult if not impossible to do. The service life of an asset such as a pipe depends on many factors such as the materials it is constructed from, the properties of the soils that it is buried in, how it was installed and many, many other factors. For this reason lifespan estimates are generally based on "rule of thumb" values. Most rule of thumb lifespans applied by engineers are conservative (on the safe side). In reality many assets could actually last much longer (50% longer or possibly more) than these estimates. For this reason, we have included two indicators for informing the targeted annual investment amount: the annual average life cycle investment (AALCI) and the 20 year average annual investment (AAI). See Table 1.1 for details.

The AALCI is presented at $3.8M/yr using the conservative rule of thumb lifespan. The AAI is $3.5M/yr for the twenty year horizon using the same service life estimates. By assuming the assets will last longer (lower annual investment level) the RDCO assumes more risk. It is at the discretion of the RDCO Board to decide what level of risk they are comfortable with and to revisit those assumptions on a regular basis. The focus of this report supports the conservative measure of funding the AALCI; however, the AAI should be considered if more funds are required in the near term for immediate improvements.

INTRODUCTION

Many governments, like RDCO, are turning toward asset management as a process for making informed infrastructure decisions, build financial capacity to renew, operate and maintain existing infrastructure so that the RDCO can continue to provide services, effectively manage risks, and provide tax payers with the best value for money.

A key next step for RDCO in achieving this outcome is to improve its understanding of costs through completing a detailed asset assessment (cost forecast) of the community's future infrastructure renewal investment requirements. This forecast will provide staff with improved information (cost and timing) and key indicators to inform infrastructure investment decision-making and assist in aligning priorities and setting utility rates. To accomplish this, the RDCO engaged Urban Systems to complete a long term (integrated) Asset Management Investment Plan (AMIP).

The AMIP is based on the BC Framework (see Figure 1.1) and was developed to identify and assess the expected replacement costs and needs for each of RDCO's assets. The AMIP (Appendix A) consolidates all of the long term costs and timing for a community's major infrastructure categories into a long-term asset renewal forecast. This enables the RDCO to see a forecast of their infrastructure's life cycle cost pressures in one place, at a glance. The AMIP is also an ideal tool to engage rate payers by showing how infrastructure performance and age is linked to annual investments (into reserves or renewal projects). The AMIP includes details and summaries of:

- current replacement value
- infrastructure deficit
- looming future costs
- AALCI required for on-going investment planning
- forecasted renewal of public infrastructure (AAI)

WHAT IS ASSET MANAGEMENT?

The process of bringing together the skills and activities of people; with information about the community's physical infrastructure assets and financial resources to ensure long term sustainable service delivery.

Sound asset management practices support sustainable service delivery by considering community priorities, informed by an understanding of the trade-offs between the available resources, risk and the desired services.

Sustainable service delivery ensures that current community services are delivered in a social, economic, and environmentally responsible manner that does not compromise the ability of future generations to meet their own needs.

Figure 1.1: Asset Management for Sustainable Service Delivery, A BC Framework

CANADIAN'S INFRASTRUCTURE CHALLENGE

Communities across Canada are currently faced with infrastructural and organizational challenges. Many are realizing that the majority of their infrastructure was installed decades ago and has continually provided service to the community with little to no service disruption. These assets, which have provided significant value to the community, are now nearing the end of their useful life; however, many local governments have not fully planned for their replacement.

FCM recently completed a study that concluded that estimates Canada's infrastructure deficit to be 123 billion and growing. A recent study by BCWWA, titled "Are our water systems at risk?" found that the majority of BC water and sewer systems are not recovering the full cost of service delivery through user fees.

With increasing cost pressures and unsustainable funding approaches, communities are beginning to realize they need to change the way they think about managing their assets, recovering revenues, and delivering services. Communities are now embracing the need to integrate asset management principals and thinking into their organization with the goal to:

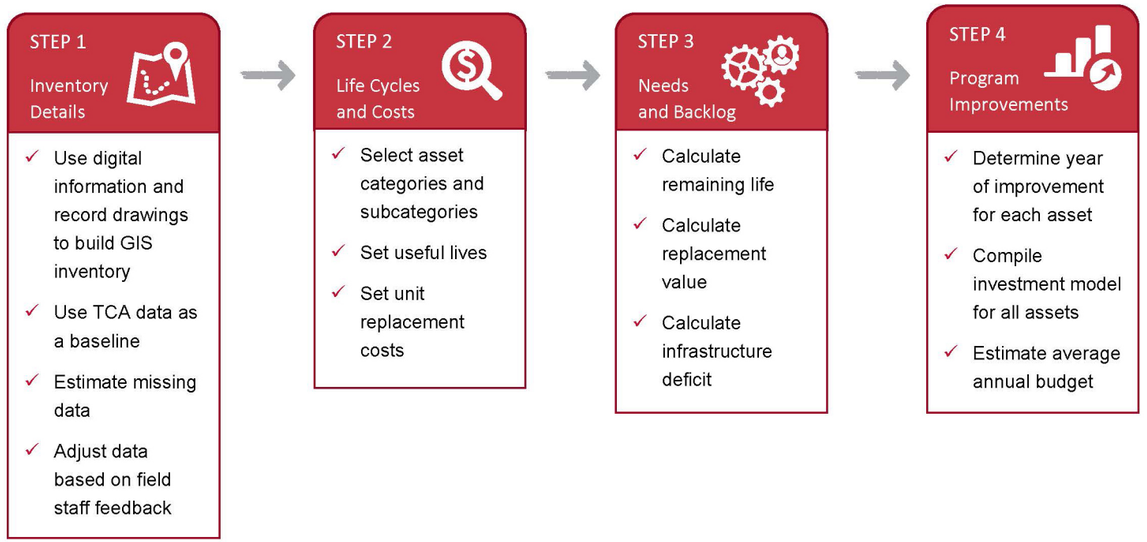
- be financially sustainable over the long term;
- reduce the need to place a large financial burden on future generations;
- increase the likelihood that user fees and rates are stable and consistent and reduce the need to have large 'one-off' increases; and
- increase the likelihood that service levels can be maintained over the long term

With this understanding, the RDCO has invested in developing an Asset Management Investment Plan (AMIP) as the first step in better understanding their own unique infrastructure challenges.

AMIP METHODOLOGY

The AMIP forecast is predominantly based upon infrastructure service lives, but also considers condition assessment information where available. To develop the AMIP, a 4-Step analytical approach was used (see Figure 2.1 below).

Figure 2.1: AMIP Development Steps



RDCO's AMIP for asset renewal was built using the best linear and non-linear asset data available. The most recent digital infrastructure information for RDCO has been reviewed for use in developing the AMIP. This information is primarily based on compiled infrastructure record drawings and GIS datasets received from the RDCO, coupled with information from the Tangible Capital Assets (TCA) inventory. An estimate was made for missing data where possible. The GIS information was the primary source used for the majority of the asset inventory which was cross checked against the operations department's record information and anecdotal knowledge of the systems.

As a next step in the evolution of the RDCO's asset management process, the AMIP inventory should be built upon to develop a prioritized capital plan based on risk, service and cost. It also is suggested that the RDCO continue to undertake an on-going program for improving data collection in order to refine the complete data set for long term asset management purposes.

[1]The expected life remaining is a ratio between remaining life and replacement value. This is based on straight line depreciation of the asset over its service life.

[2]AALCI is the annual depreciation of the replacement value. The AALCI represents the ideal annual budget allocation. Annual surpluses would go into reserves and be drawn upon for renewal of assets. When the annual budget is less than the AALCI, the sustainability gap grows.

The AMIP outlines the following:

- Current replacement value;
- Remaining value;
- Expected life remaining;
- Required improvements;
- Infrastructure deficit (backlog);
- 20 year renewal costs and timing (including future looming costs); and,
- Average Annual Life Cycle Investment (AALCI)

The AMIP is a spreadsheet which is delivered in three (3) inter-connected levels:

1. Summary for investment planning and decision-makers;
2. Detailed data for ongoing reporting, operations and maintenance; and
3. Highly detailed segment by segment information regarding the linear infrastructure such as pipe and roads.

The benefits of the AMIP's Level 1 summary include:

- Presents a complete and concise summary of all infrastructure assets on 1 page;
- Provides a comprehensive focus and format for community infrastructure outreach programs;
- Uses very detailed information from Level 2, which provides invaluable asset details for more credible and defensible decisions on infrastructure re-investment; and
- Encourages exploration of sustainable infrastructure renewal funding levels.

HOW TO USE THE INVESTMENT PLAN MODEL

The forecast model is driven by input tables; however, when sufficient data is not available for the input tables, or asset-specific changes are made, then estimates are done in the excel worksheets. In addition to its financial information, the investment plan database also uses the following asset attributes:

- Location
- Material or Make
- Size or Model
- Dimensions
- Quantity
- Year Built
- Service Life
- Condition rating (where available) and
- Installation cost:
  Recent Tendered Construction costs;
  Construction contingency costs;
  Planning and design costs;
  Project management costs; and
  Construction administration costs.

Figure 2.2 Informed Decision Making

The AMIP model is designed to keep calculating year after year. The AMIP can be updated each year by adjusting the model to the current year (Input Table), updating unit costs and other replacement values to reflect inflation, and updating the asset inventory to include annual project renewals, decommissioning, and new acquisitions.

The power of the AMIP model is that it uses actual replacement costs, service lives based upon healthy maintenance programs, and summarizes all infrastructure information in Level 1 to assist RDCO in better understanding their cost pressures to help inform their budgeting and infrastructure decisions (Figure 2.2).

AMIP RESULTS

The AMIP's Level 1 summary presents a one page overview of asset renewal needs, rolled-up for all asset categories and sub-categories in RDCO. It presents the current renewal investment forecast for RDCO's major asset categories over a 20 year period, using a conservative life span estimate and includes indicators for forecasting a sustainable infrastructure funding level.

This AMIP scenario assumes that an adequate annual operations and maintenance (O&M) budget is in place to optimize asset service lives. Reduced or inadequate O&M budget levels would reduce the service lives. More detailed information regarding each individual asset categories can be seen in the level 2 summaries (section 4). Table 1.2 summarizes the key results of the AMIP.

Table 1.2: AMIP Summary

Asset Category	100% Replacement Value	Expected Remaining Life	Infrastructure Deficit (Backlog)	20 Year Average Annual Investment (AAI)	Average Annual Life Cycle Investment (AALCI)
Killiney Water System	$19,273,855	39%	$0	$486,783	$324,569
Falcon Ridge Water System	$4,206,342	69%	$165,000	$19,819	$60,523
Star Place Water System	$657,710	56%	$0	$16,571	$13,965
Sunset Ranch Water System	$7,964,002	78%	$0	$41,115	$127,326
Westshore Water System	$17,513,365	22%	$1,684,901	$793,798	$358,992
Fintry Water System	$12,752,730	92%	$0	$17,771	$172,145
Sanitary Sewer System					
Westside Collection	$24,315,287	70%	$850,000	$57,888	$354,808
Treatment	$56,381,162	65%	$7,636,441	$1,498,799	$1,828,863
Sunset Sanitary	$3,872,645	87%	$0	$0	$38,798
Solid Waste	$11,682,562	53%	$0	$582,878	$583,828
Total	**$158,619,663**	**60%**	**$10,336,342**	**$3,515,422**	**$3,863,818**

Average Annual Life Cycle Investment (AALCI): forecasted annual investment needed to sustain existing infrastructure over its service life (over the next 20 years and beyond).

20 Year Average Annual Investment (AAI): total forecasted investment needed to replace infrastructure that has passed its theoretical service within the next 20 years.

Infrastructure Deficit (Unfunded Liability): is a measure of the amount of infrastructure that has already passed its theoretical service life but is still providing service to the community. This infrastructure should be inspected to determine if replacement is necessary or not.

Figure 3.2 Infrastucture Value Distribution

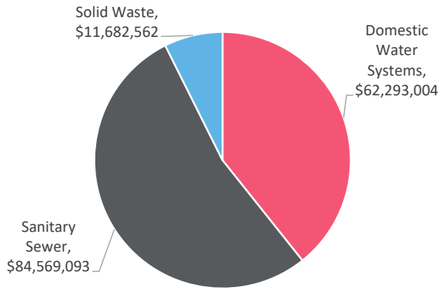
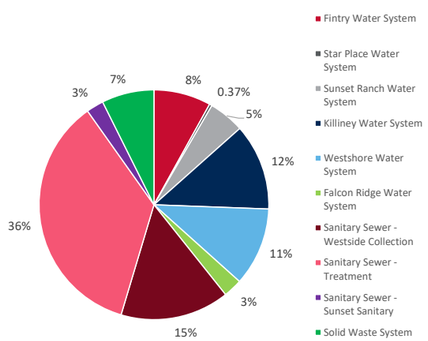


Figure 3.3 AALCI Value Distribution



ASSET REPLACEMENT VALUE

The estimated full replacement value of RDCO's major infrastructure assets is approximately $158 million (2018) based on current tender prices in the BC Interior region and best practices for setting service lives. A copy of the inputs (unit costs and service lives) is located in Appendix B.

Table 1.2 (above) provides a summary of the replacement value of existing infrastructure; with some regulatory requirements for the water system included. The AMIP should be used to inform the development of a comprehensive capital plan so that these items can be integrated together.

Figure 3.2 illustrates the percent breakdown of RDCO's infrastructure value by asset category.

Approximately 90% of RDCO's infrastructure is made of up Water and Sanitary assets which mean majority of the total long term expenditures should be on these assets. On average, RDCO assets are considered to be in fair to good condition with an average expected remaining life of 67% and there are assets ($10.3M) that have passed their theoretical service life which should be inspected in the field prior to investing in their replacement. In the twenty year horizon there is approximately $67M forecasted in assets that may need to be renewed. These results are comparable to other communities of similar size and age to RDCO.

INFRASTRUCTURE DEFICIT (UNFUNDED LIABILITY)

Infrastructure deficit ($10.3M) is a measure of the amount of infrastructure that has passed its theoretical service life but is still providing service to the community.

Current Year > Year of Asset Renewal

Although the asset is still providing service, it is typically nearing the end of its life and will require field investigation to determine if the asset needs to be replaced or not. Changes in the asset service life can turn future expenditures to a deficit or vice versa. For example: an asset is scheduled for replacement in 2018 which means the asset has passed its theoretical service life and will be recorded as a deficit. If that assets service life is extended, the asset is now scheduled in a future year as an asset replacement and not a deficit.

AVERAGE ANNUAL LIFE CYCLE INVESTMENT (AALCI)

The Average Annual Life Cycle Investment (AALCI) is defined as the summation of each asset's annual depreciation which is based on the assets replacement cost and service life.

$$\sum \frac{\text{Replacement Cost}}{\text{Service Life}}$$

The AALCI ($3.8M) is the forecasted ideal (maximum) funding level for sustaining existing infrastructure over the life cycle of the assets and should be a long term target for the community. When planned for appropriately, the AALCI can be used in ensuring long term revenue stability, preventing unnecessary risk, and enabling a community to apply one-time funding to support new asset/capital needs as opposed to addressing emergency situations.

Ideally RDCO should endeavor, depending on risk tolerance and service levels, to budget for this amount each year, and what is not spent goes into infrastructure reserve accounts for future renewal. Figure 3.3 illustrates the value and percent breakdown of RDCO's AALCI distribution based on the conservative estimate of service life scenario.

20 YEAR AVERAGE ANNUAL INVESTMENT (AAI)

Another indicator that can be used to determine the appropriate investment level is the 20 Year Average Annual Investment (AAI).

$$\frac{\text{Total Anticipated 20 Year Capital Expenditure}}{\text{20 Years}}$$

This indicator provides a value of how much should be invested on an annual basis at a minimum to fund asset replacements anticipated over the next 20 years ($3.5M).

Service life directly affects the timing of the 20 year expenditures as it dictates when an asset is scheduled for replacement. For example: If the asset service life is extended, the replacement year might change from 2035 to 2045 which defers the project outside the 20 year planning horizon and reduces 20 Year AAI. It is important to note that this does not make the expenditure disappear but instead it just postpones it. This is why the AALCI may be better long term financial indicator (target) because it accounts for replacements outside the planning horizon.

RDCO should consider its affordability limits, costs, risk and service in determining the annual investment amount into infrastructure. Later sections of this report provides some considerations and recommendations for RDCO in considering its sustainable infrastructure funding levels.

STATE OF RDCO'S INFRASTRUCTURE

This section details the AMIP findings by each of the RDCO's asset categories (Level 2).

1 What assets do we own?

Taking stock of assets within a community is foundational to the development of an AMIP. The first step in building an inventory is gathering all available data, then collecting important attributes for each asset such as: quantity, diameter, year of installation, material, etc.

The value of this inventory extends well beyond this project as this database can now be used as the central source of asset information moving forward.

The methodology used to compile this inventory is detailed in Appendix A.

2 How much are our assets worth?

Calculating the replacement cost of a community's assets provides the organization with a deeper understanding of the magnitude of infrastructure that it is responsible for managing and replacing. These cost figures directly affect the asset reinvestment level and are a driver for future revenue requirements. Replacement costs presented in this report represents the magnitude of investment required to replace all assets as they exist today. The asset replacement costs typically do not account for new investment required to satisfy; regulatory requirements, growth/ expansion, safety improvements, or economic development. In this report, we have at the request of RDCO, included cost for future regulatory requirements (ie. UV Treatment)

3 How much life is left in our assets?

Remaining life of an asset is one indicator that can be used to understand the theoretical condition of an asset. The condition of the asset can then inform asset reinvestment and inspection programs.

Since the actual physical condition of the asset is not known, the age of the asset is used to estimate its condition (refer to Terms and Definitions)

4 When will our assets pass their estimated service life?

Accurately predicting when infrastructure will need to be replaced is difficult, if not impossible, to do. The service life (how long an asset will last) is a highly uncertain parameter that is affected by many factors such as material, environment, and construction techniques. Nonetheless, mapping replacement timing is valuable in helping communities begin planning for future expenditures. For example, the investment cost forecast may show a significant expenditure in 2025, representing a large number of watermains that are predicted to need replacing. While it is unlikely that all of these watermains would need to be replaced at the same time, replacement timing estimates provide an indication that a large investment might occur and that further investigation is required to confirm the urgency of these investments.

5 How much do we need to invest in our assets?

Predicting the right investment level needed for infrastructure renewal requires significant thought and discussion amongst stakeholders. To better understand a community's initial long-term investment needs, three indicators have been calculated.

- Investment Level Indicators:
  1) Average Annual Life Cycle Investment (AALCI)
  2) 20 Year Average Annual Investment (20 Year AAI)
  3) Infrastructure Deficit (Unfunded Liability)

  (refer to Terms and Definitions)

- Each of these indicators are calculated using replacement costs and service life estimates. Accurately predicting when infrastructure will need to be replaced is very difficult to do. For this reason, lifespan estimates are generally based on rule of thumb values. Most rule of the thumb lifespans applied by engineers are conservative (on the safe side). In practice, many assets could last much longer (25% longer or possibly more) than these estimates. For these reasons, we have developed three service life scenarios (refer to terms and definitions) which will help highlight how investments level would change depending on the various lifespan assumptions.

- Each of these questions (1 to 5) is graphically presented in the body of this report.
- These investment level indicators do not account for existing reserves balances or future grants. These indicators are to be used as a forecast of costs to inform the RDCO's revenue requirements.

WATER SYSTEMS – KILLINEY

What assets do we own?

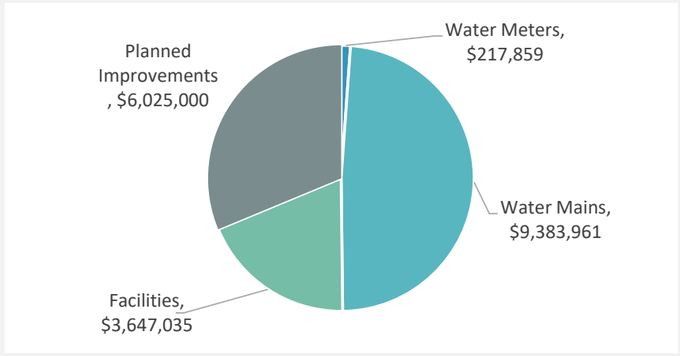
Watermain 14.3 km

Pumps 4

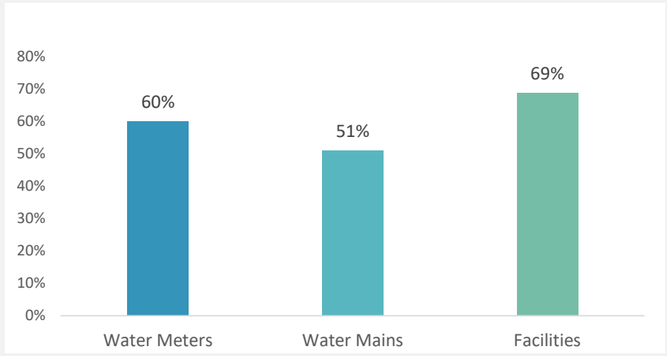
Reservoirs 4

PRVs 2

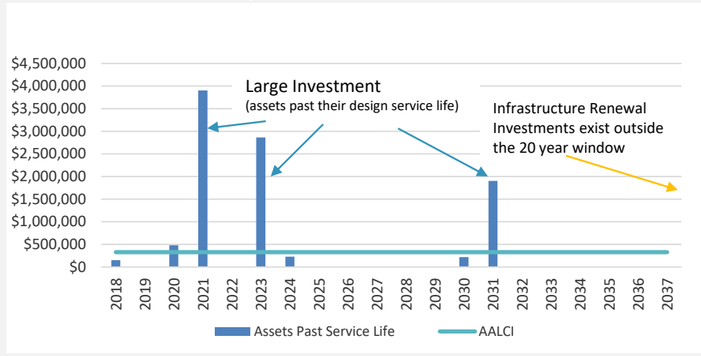
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$217,859	60%	$10,893	$10,893
Water Mains	***Diameter (mm)***				
>= 600	>= 600	$0	0%	$0	$0
500	500	$0	0%	$0	$0
450	450	$0	0%	$0	$0
400	400	$0	0%	$0	$0
350	350	$0	0%	$0	$0
300	300	$0	0%	$0	$0
250	250	$154,400	65%	$0	$1,544
200	200	$1,267,793	62%	$23,930	$12,678
150	150	$3,908,554	62%	$23,932	$39,086
<150	<150	$4,053,216	36%	$89,278	$40,532
		$9,383,961	**51%**	**$137,140**	**$93,840**
Facilities					
Reservoirs		$1,770,035	83%	$0	$22,125
Pumphouse		$1,427,000	62%	$30,000	$35,675
Intakes		$300,000	56%	$0	$3,750
PRV's		$150,000	0%	$7,500	$4,286
		$3,647,035	**69%**	**$37,500**	**$65,836**
Total without Planned Improvements		**$13,248,855**	**56%**	**$185,533**	**$170,569**
Planned Improvements					
Back-up Generator (3)		$225,000	0%	$11,250	$9,000
Treatment		$5,800,000	0%	$290,000	$145,000
		$6,025,000	**0%**	**$301,250**	**$154,000**
Grand Total		**$19,273,855**	**39%**	**$486,783**	**$324,569**

WATER SYSTEMS – FALCON RIDGE

What assets do we own?

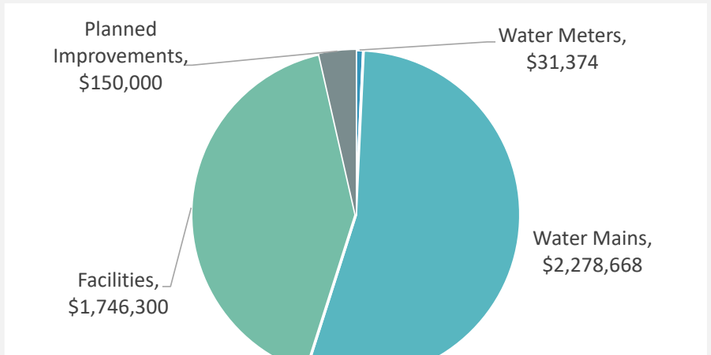
Watermain 3.3 km

Pumps 1

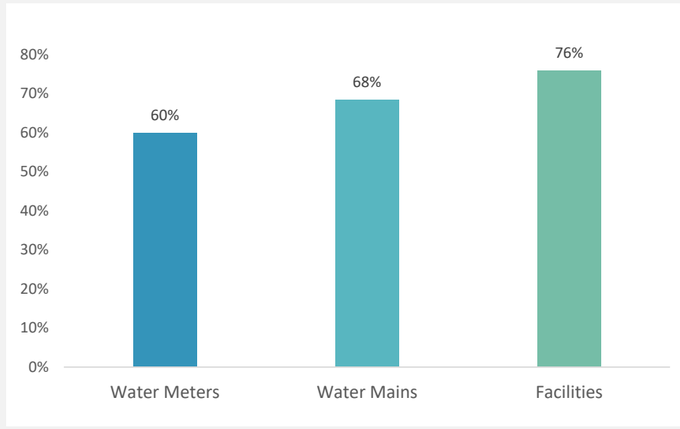
Reservoirs 1

PRVs 0

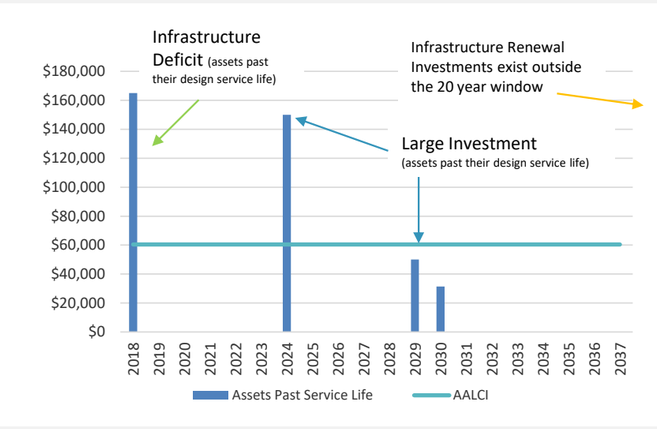
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$31,374	60%	$1,569	$1,569
Water Mains	***Diameter (mm)***				
200	200	$0	0%	$0	$0
150	150	$1,563,690	71%	$0	$15,637
100	100	$714,978	63%	$0	$9,201
		$2,278,668	**68%**	**$0**	**$24,838**
Facilities					
WELL KIOSK		$15,000	0%	$750	$600
WELL		$150,000	0%	$7,500	$6,000
PUMPHOUSE		$50,000	28%	$2,500	$1,250
INTAKE		$150,000	98%	$0	$3,000
RESERVOIRS + UV		$1,381,300	84%	$0	$17,266
		$1,746,300	**76%**	**$10,750**	**$28,116**
Total without Planned Improvements		**$4,056,342**	**72%**	**$12,319**	**$54,523**
Planned Improvements					
Back-up Generator (2)		$150,000	0%	$7,500	$6,000
Grand Total		**$4,206,342**	**69%**	**$19,819**	**$60,523**

WATER SYSTEMS – SUNSET RANCH

What assets do we own?

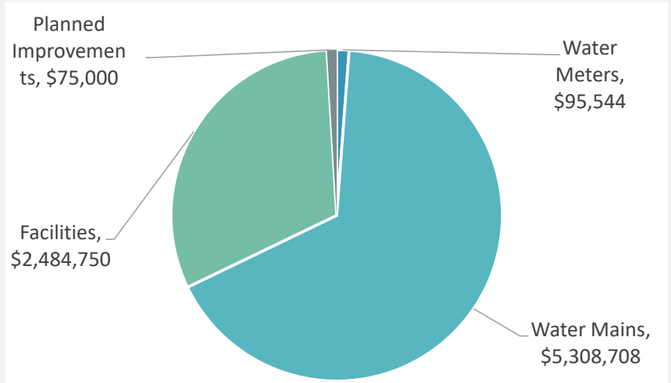
Watermain 7.5 km

Pumps 2

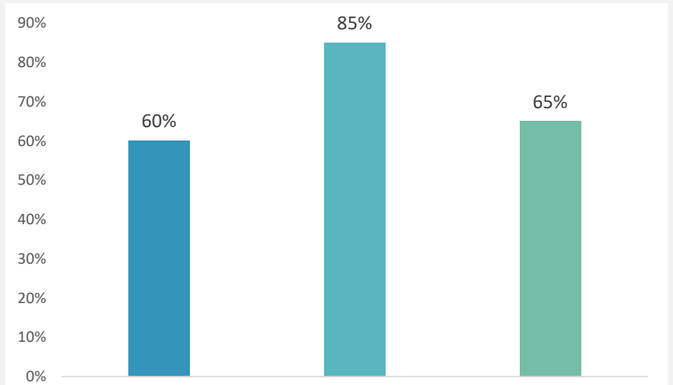
Reservoirs 1

PRVs 1

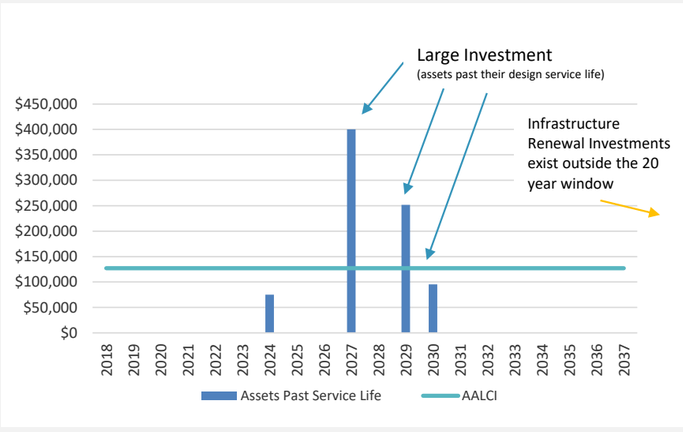
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$95,544	60%	$4,777	$4,777
Water Mains	***Diameter (mm)***				
250	***250***	$220,919	89%	$0	$2,763
200	200	$3,178,960	88%	$0	$31,309
150	150	$1,882,382	80%	$0	$24,868
<150	<150	$26,445	89%	$0	$264
		$5,308,708	**85%**	**$0**	**$59,204**
Facilities					
Manholes, Sampling, Chlorination		$91,750	41%	$3,838	$3,370
PRV		$75,000	36%	$3,750	$3,000
RESERVOIR		$918,000	80%	$0	$11,475
PUMP HOUSE		$900,000	68%	$0	$22,500
WELL		$500,000	40%	$25,000	$20,000
		$2,484,750	**65%**	**$32,588**	**$60,345**
Total without Planned Improvements		$7,889,002	78%	$37,365	$124,326
Planned Improvements					
Planned Back-up Generator (1)		$75,000	0%	$3,750	$3,000
Subtotal		**$7,964,002**	**78%**	**$41,115**	**$127,326**

WATER SYSTEMS – WESTSHORE

What assets do we own?

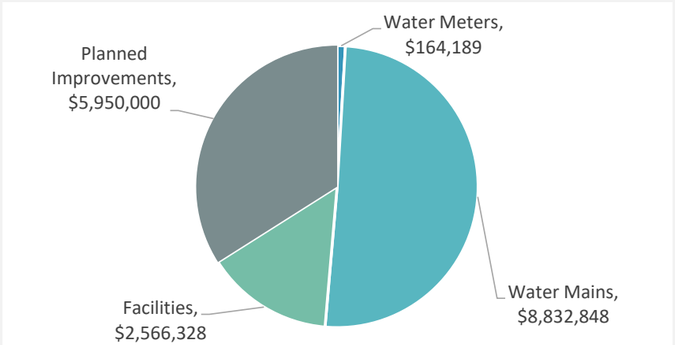
Watermain 14.5 km

Pumps 2

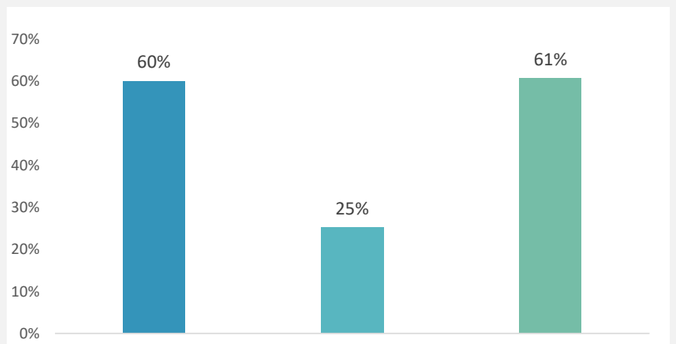
Reservoirs 2

PRVs 3

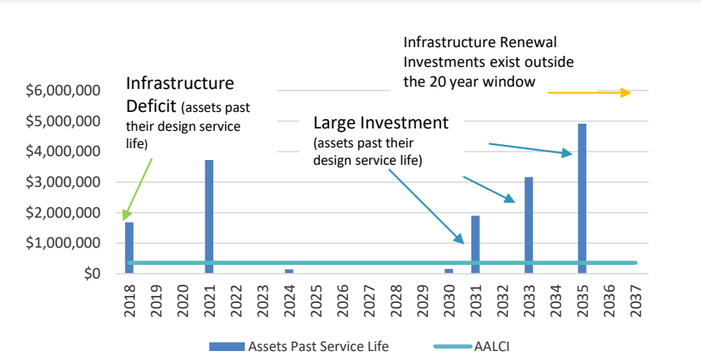
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$164,189	60%	$8,209	$8,209
Water Mains	*Diameter (mm)*				
450	450	$0	0%	$0	$0
400	400	$0	0%	$0	$0
350	350	$0	0%	$0	$0
300	300	$28,507	28%	$1,425	$475
250	250	$1,206,429	28%	$60,321	$20,107
200	200	$1,395,696	27%	$69,671	$23,262
150	150	$5,148,691	27%	$257,435	$85,812
<150	<150	$1,053,525	11%	$50,486	$23,183
		$8,832,848	**25%**	**$439,338**	**$152,838**
Facilities					
Reservoirs		$1,441,328	99%	$0	$18,017
Intake		$300,000	0%	$15,000	$7,500
Pumphouse		$600,000	0%	$30,000	$15,000
PRV's		$225,000	59%	$3,750	$6,429
		$2,566,328	**61%**	**$48,750**	**$46,945**
Total without Planned Improvements		$11,563,365	34%	$496,298	$207,993
Planned Improvements					
Back-up Generator (2)		$150,000	0%	$7,500	$6,000
Treatment		$5,800,000	0%	$290,000	$145,000
		$5,950,000	**0%**	**$297,500**	**$151,000**
Grand Total		$17,513,365	22%	$793,798	$358,993

WATER SYSTEMS – FINTRY

What assets do we own?

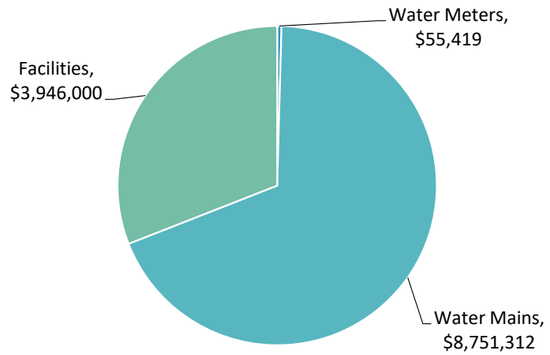
Watermain 11.6 km

Pumps 3

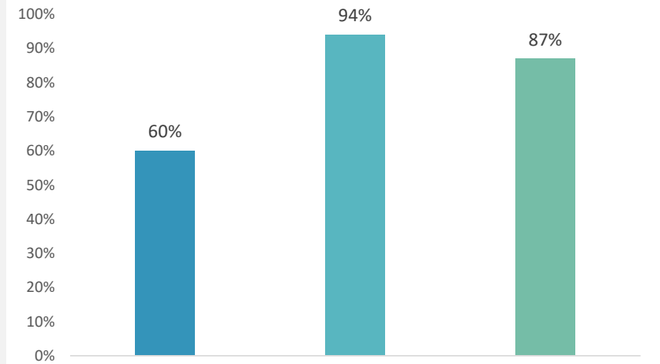
Reservoirs 2

PRVs 2

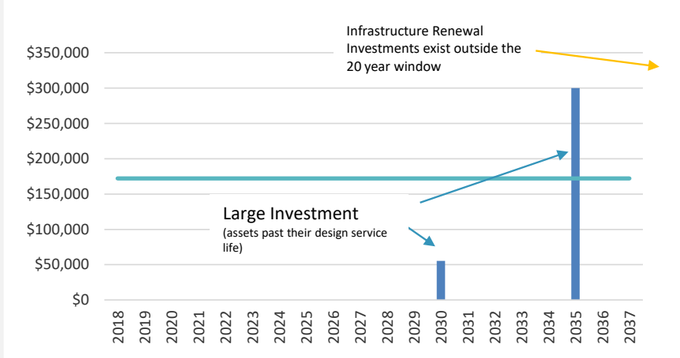
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$55,419	60%	$2,771	**$2,771**
Water Mains	***Diameter (mm)***				
>= 600	>= 600	$0	0%	$0	$0
500	500	$0	0%	$0	$0
450	450	$0	0%	$0	$0
400	400	$0	0%	$0	$0
350	350	$0	0%	$0	$0
300	300	$3,822,416	94%	$0	$38,224
250	250	$902,138	94%	$0	$9,021
200	200	$1,884,976	94%	$0	$18,850
150	150	$1,709,334	94%	$0	$17,093
<150	<150	$432,448	94%	$0	$4,324
		$8,751,312	**94%**	**$0**	**$87,513**
Facilities					
PRESSURE REDUCING		$150,000	**83%**	$0	$4,286
PUMP HOUSE		$1,750,000	**85%**	$0	$43,750
RESERVOIR		$1,746,000	**93%**	$0	$21,825
WELL		$300,000	**68%**	$15,000	$12,000
		$3,946,000	**87%**	**$15,000**	**$81,861**
Total		**$12,752,730**	**92%**	**$17,771**	**$172,145**

WATER SYSTEMS – STAR PLACE

What assets do we own?

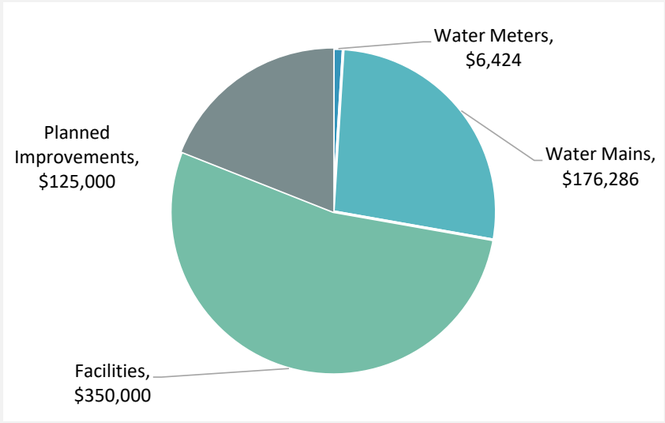
Watermain 300m

Pumps 1

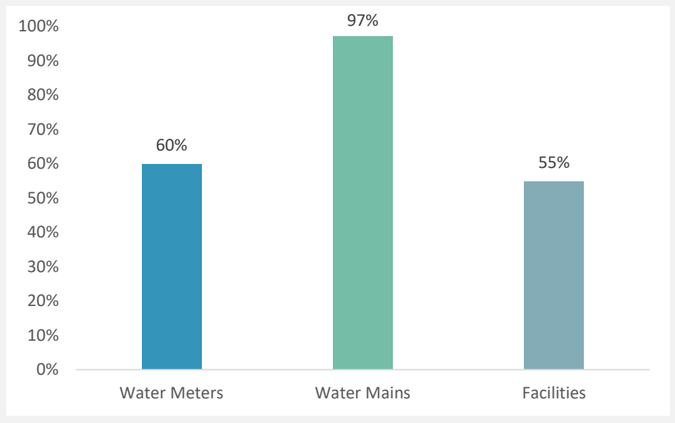
Reservoirs 1

PRVs 0

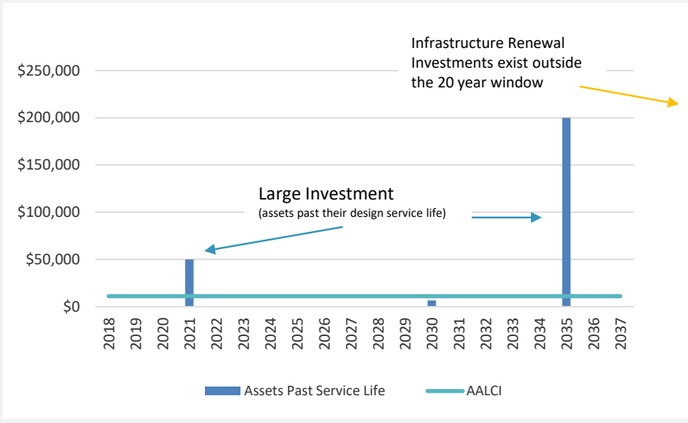
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Water Meters		$6,424	60%	$321	$321
Water Mains	***Diameter (mm)***				
300	300	$0	0%	$0	$0
250	250	$0	0%	$0	$0
200	200	$0	0%	$0	$0
150	150	$0	0%	$0	$0
<150	<150	$176,286	97%	$0	$2,518
		$176,286	**97%**	**$0**	**$2,518**
Facilities					
Reservoir and Pumphouse		$350,000	55%	$10,000	$6,875
Total without Planned Improvements		**$532,710**	**69%**	**$10,321**	**$9,715**
Planned Improvements					
Back-up Generator (1)		$75,000	0%	$3,750	$3,000
Treatment (UV/Filtration)		$50,000	0%	$2,500	$1,250
		$125,000	**0%**	**$6,250**	**$4,250**
Grand Total		**$657,710**	**56%**	**$16,571**	**$13,965**

SANITARY SYSTEM – COLLECTION SYSTEM

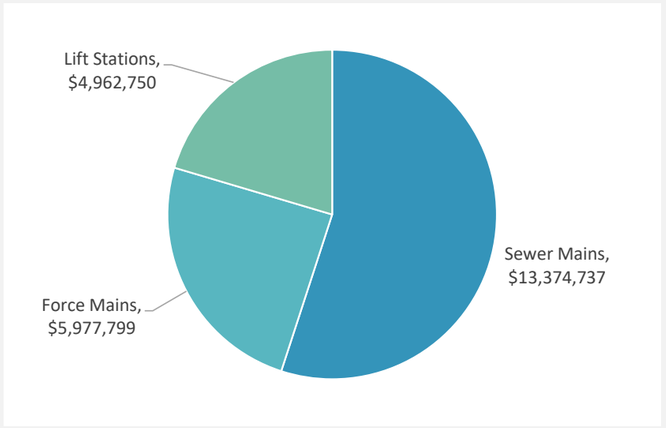
What assets do we own?

Mains
19.4 km

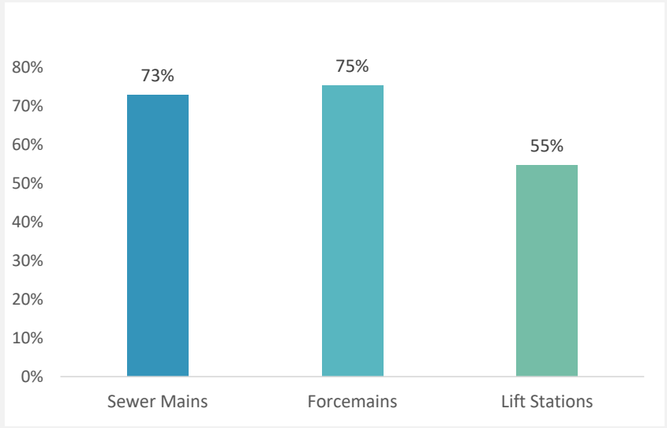
Forcemains
9.9 km

Lift Stations
2

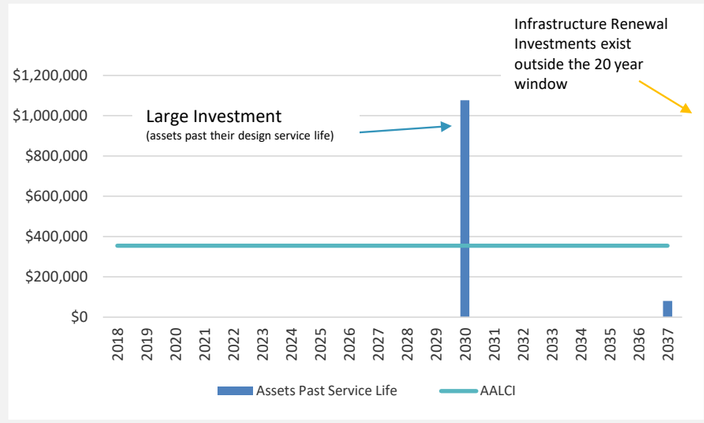
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Gravity Mains					
Sewer Mains	***Diameter***				
>= 600	*>= 600*	$4,737,861	69%	$0	$51,888
525	*525*	$1,099,013	73%	$0	$11,699
450	*450*	$1,682,214	70%	$0	$18,159
375	*375*	$3,978,158	77%	$0	$40,546
300	*300*	$1,005,316	79%	$0	$10,772
250	*250*	$276,116	74%	$0	$2,761
200	*200*	$596,058	76%	$0	$5,961
		$13,374,737	**73%**	**$0**	**$141,785**
Forcemains		**$ 5,977,799**	**75%**	**$ 0**	**$75,698**
Lift Stations					
Casa Loma		$1,944,000	58%	$43,200	$56,700
East Trunk		$3,018,750	53%	$14,688	$80,625
		$4,962,750	**55%**	**$57,888**	**$137,325**

SANITARY SYSTEM – SUNSET SANITARY SYSTEM

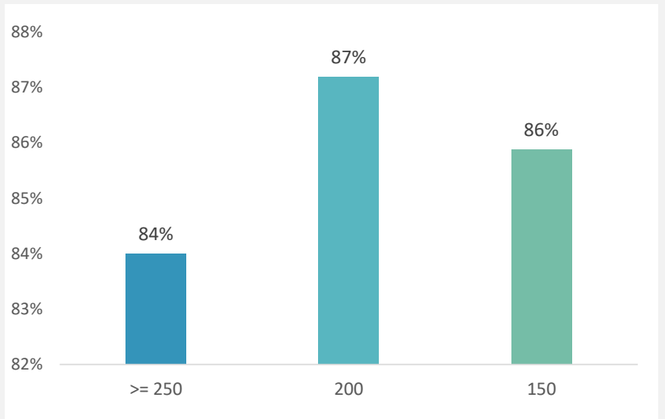
What assets do we own?

Mains

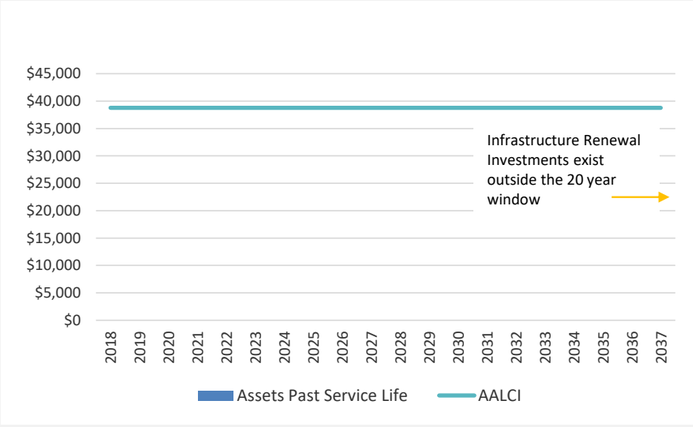
7.5 km

How much are our assets worth?

How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Sunset Sanitary System					
	Diameter				
>= 250	*>= 250*	$711,731	84%	$0	$7,117
200	*200*	$3,114,329	87%	$0	$31,215
150	*150*	$46,585	86%	$0	$466
		$3,872,645	**87%**	**$0**	**$38,798**

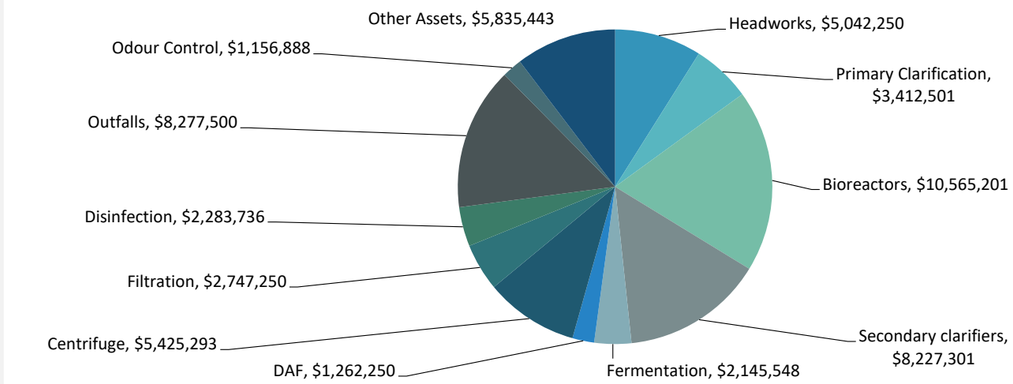
SANITARY SYSTEM - WWTP

What assets do we own?

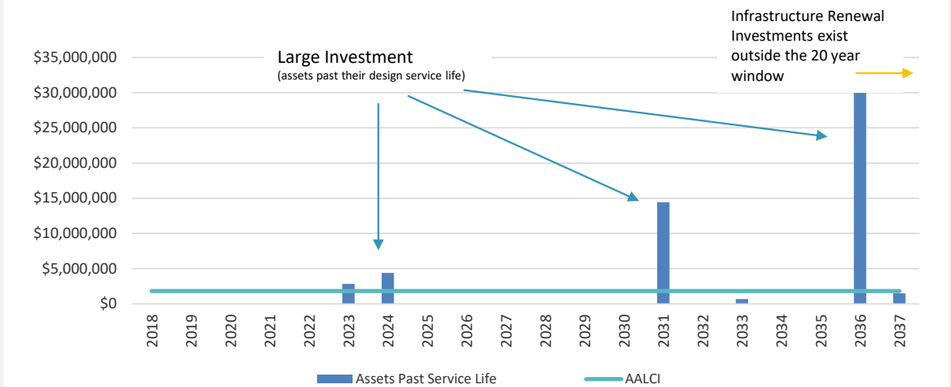
Treatment

1

How much are our assets worth?



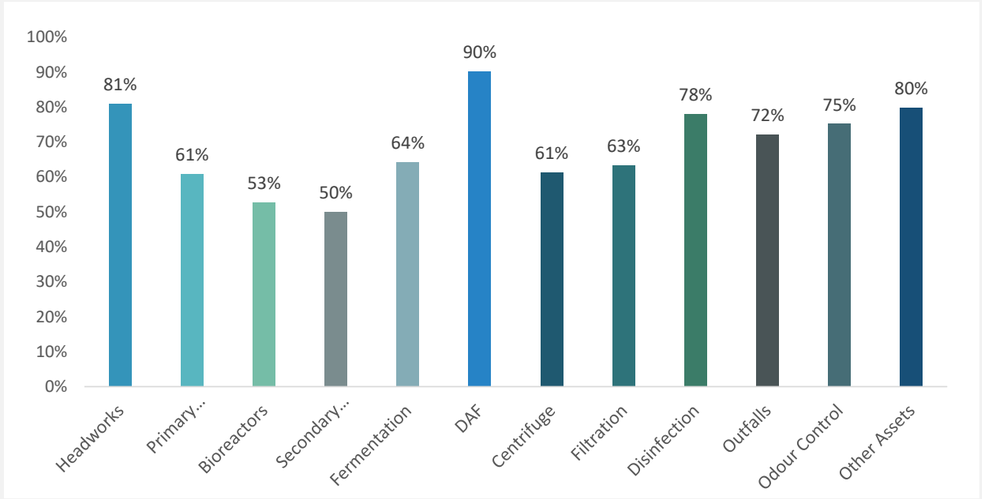
When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Treatment					
Headworks		$5,042,250	81%	$139,050	$167,316
Primary Clarification		$3,412,501	61%	$38,813	$71,766
Bioreactors		$10,565,201	53%	$364,500	$405,440
Secondary clarifiers		$8,227,301	50%	$292,941	$322,547
Fermentation		$2,145,548	64%	$54,290	$67,537
DAF		$1,262,250	90%	$33,750	$41,091
Centrifuge		$5,425,293	61%	$162,000	$189,316
Filtration		$2,747,250	63%	$108,000	$115,341
Disinfection		$2,283,736	78%	$78,689	$87,563
Outfalls		$8,277,500	72%	$77,625	$161,688
Odour Control		$1,156,888	75%	$57,237	$57,389
Other Assets		$5,835,443	80%	$91,905	$141,872
		$56,381,162	**65%**	**$1,498,799**	**$1,828,863**

How much life is left in our assets?



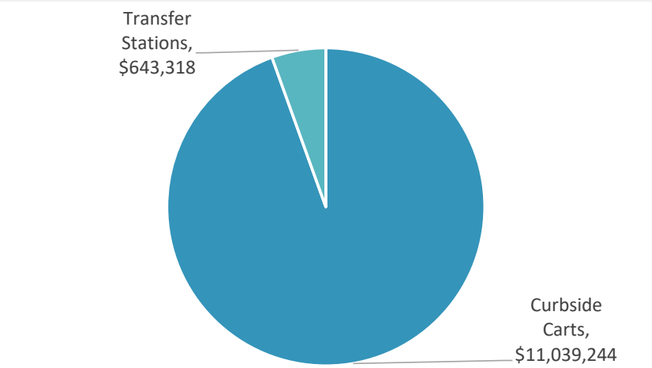
SOLID WASTE SYSTEM

What assets do we own?

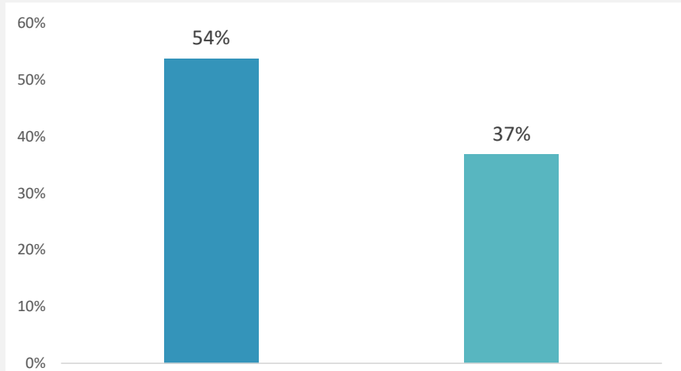
Curbside Carts
178,532

Transfer Stations
3

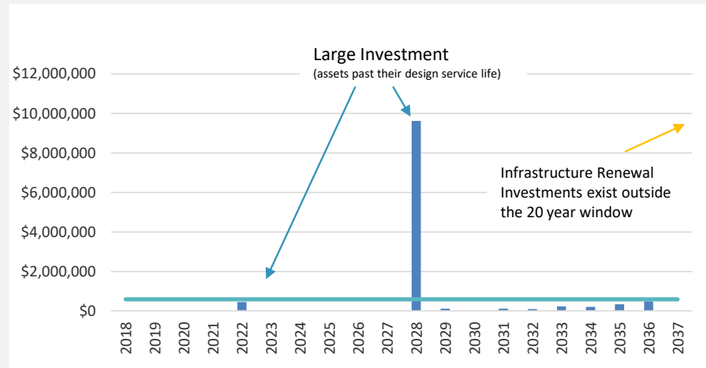
How much are our assets worth?



How much life is left in our assets?



When will our assets pass their estimated service life?



How much do we need to invest in our assets?

Sub-category	Asset Description	100% Replacement Value	Expected Remaining Life	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
Curbside Carts					
Kelowna	120L	$ 2,064,480	54%	$ 103,224	$ 103,224
	240L	$ 4,300,956	51%	$ 215,048	$ 215,048
	360L	$ 897,450	69%	$ 44,873	$ 44,873
	Sub-Total	**$ 7,262,886**	**54%**	**$ 363,144**	**$ 363,144**
West Kelowna	120L	$ 547,740	50%	$ 27,387	$ 27,387
	240L	$ 1,312,344	52%	$ 65,617	$ 65,617
	360L	$ 229,125	68%	$ 11,456	$ 11,456
	Sub-Total	**$ 2,089,209**	**53%**	**$ 104,460**	**$ 104,460**
Lake Country	120L	$ 221,799	50%	$ 11,090	$ 11,090
	240L	$ 552,354	54%	$ 27,618	$ 27,618
	360L	$ 125,400	71%	$ 6,270	$ 6,270
	Sub-Total	**$ 899,553**	**55%**	**$ 44,978**	**$ 44,978**
Peachland	120L	$ 133,518	50%	$ 6,676	$ 6,676
	240L	$ 315,678	50%	$ 15,784	$ 15,784
	360L	$ 25,800	50%	$ 1,290	$ 1,290
	Sub-Total	**$ 474,996**	**50%**	**$ 23,750**	**$ 23,750**
RDCO	120L	$ 89,709	52%	$ 4,485	$ 4,485
	240L	$ 206,316	51%	$ 10,316	$ 10,316
	360L	$ 16,575	50%	$ 829	$ 829
	Sub-Total	**$ 312,600**	**51%**	**$ 15,630**	**$ 15,630**
	Total	**$ 11,039,244**	**54%**	**$ 551,962**	**$ 551,962**

Transfer Stations					
092 WESTSIDE TRANSFER STATION	$568,304	31%	$28,415	$29,115
093 WESTSIDE LANDFILL	$25,000	77%	$0	$250
095 SOLID WASTE COLLECTION	$50,014	80%	$2,501	$2,501
Sub-Total	$ 643,318	37%	$30,916	$31,866

MOVING FORWARD

Based on the results of the AMIP, the previously completed assessment of current practices, and the process outlined in the Asset Management for Sustainable Service Delivery, A BC Framework, the following section outlines a matrix with a list of steps (tools) and priorities for consideration of an advanced level of practicing asset management.

The steps outlined below are organized deliberately in order to promote successful implementation and improve understanding in the three pillars that inform infrastructure decisions – Cost, Risk and Service.

Number	Priority Name	BC Asset Management Framework Process	Description
1	Cross-Functional Team	People	Create a collaborative cross functional team made up of core departmental representatives to support and mentor on infrastructure decision-making and budgeting within the RDCO and their respective departments.
2	Asset Management/Financial Policy	Plan	Develop an asset management policy that encompasses procedures for data handling/tracking/updating and sharing, project prioritization, risk, and infrastructure investment decisions. The policy could include statements on how infrastructure investment will be funded whether it's through building reserves, debt or taxes, etc.
3	Setting Annual Infrastructure Investment Levels and Update Water and Sewer Rates	Plan	Consider the results of the AMIP, DCC and policy discussions to determine the affordable annual contribution to infrastructure investment (likely somewhere between the AAI and the AALCI amounts depending on risk tolerance and service levels). Update the water and sewer rate bylaws to increase revenues to achieve the desired investment levels for renewal.
5	Maintenance Management Plans	Implement Asset Management Practices	The importance of maintenance in extending service lives of assets and deferring their inevitable replacement (reducing the annual capital investment) is paramount to provide acceptable levels of service with fewer financial resources. Develop plans (including work orders, standard operating procedures, etc) for the O&M of assets to optimize/extend asset service lives.
6	Communications/ Engagement	Core Element	Develop asset management/infrastructure communications with staff and the public (e.g. benefits, requirements, products, progress). Community buy-in will be essential for setting levels of service and achieving financial sustainability/full cost recovery for service delivery.
7	Performance Measures	Measure and Report	Develop performance metrics to measure and report out on the RDCO's service delivery/asset management status to the Board and the community. These would include a set of both "leading" and "lagging" indicators that evaluate the sustainability of services (E.g. number of m of pipe replaced, number of m^2 of pavement replaced or avoided etc).
8	Refine Asset Inventory	Information	Continually update and refine your infrastructure data over time with new spatial and attribute data to improve accuracy as it becomes available through field activities. Consider completing an inventory and valuation of your natural Assets.

APPENDIX A

AMIP LEVEL 1

RDCO
Asset Management Investment Plan (AMIP)
Level 1 - Summary of Water, Sanitary and Solid Waste Infrastructure

Asset Category	Total Replacement Value	Loss in Value	Remaining Value	Expected Remaining Life	Infrastructure Deficit (Backlog)	2018	2019	2020	2021	2022	2023	2024
Domestic Water Systems												
Fintry Water System Renewal												
Water Meters	$55,419	$22,168	$33,251	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$8,751,312	$525,079	$8,226,233	94%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$3,946,000	$515,164	$3,430,836	87%	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$12,752,730**	**$1,062,410**	**$11,690,320**	**92%**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Star Place Water System Renewal												
Water Meters	$6,424	$2,569	$3,854	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$176,286	$4,961	$171,325	97%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$350,000	$158,125	$191,875	55%	$0	$0	$0	$0	$0	$0	$0	$0
Planned Improvements	*$125,000*	$0	$0	0%	$0	$0	$0	$0	$50,000	$0	$0	$75,000
Total	**$657,710**	**$165,655**	**$367,054**	**56%**	**$0**	**$0**	**$0**	**$0**	**$50,000**	**$0**	**$0**	**$75,000**
Sunset Ranch Water System Renewal												
Water Meters	$95,544	$38,218	$57,326	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$5,308,708	$800,116	$4,508,592	85%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$2,484,750	$870,380	$1,614,370	65%	$0	$0	$0	$0	$0	$0	$0	$0
Planned Improvements	*$75,000*	$0	$0	0%	$0	$0	$0	$0	$0	$0	$0	$75,000
Total	**$7,964,002**	**$1,708,714**	**$6,180,288**	**78%**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Killiney Water System Renewal + Treatment												
Water Meters	$217,859	$87,144	$130,715	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$9,383,961	$4,596,354	$4,787,607	51%	$0	$0	$0	$478,593	$0	$0	$2,264,210	$0
Facilities	$3,647,035	$1,133,553	$2,513,482	69%	$0	$450,000	$0	$2,392,964	$0	$0	$13,121,049	
Planned Improvements	*$6,025,000*	*$0*	*$0*	0%	$0	$0	$0	$3,900,000	$0	$0	$0	$225,000
Total	**$19,273,855**	**$5,817,051**	**$7,431,804**	**39%**	**$0**	**$450,000**	**$0**	**$6,771,556**	**$0**	**$0**	**$15,385,259**	**$225,000**
Westshore Water System Renewal + Treatment												
Water Meters	$164,189	$65,676	$98,513	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$8,832,848	$6,610,130	$2,222,718	25%	$709,901	$0	$0	$0	$0	$0	$0	$0
Facilities	$2,566,328	$1,010,159	$1,556,169	61%	$975,000	$0	$0	$0	$0	$0	$0	$150,000
Planned Improvements	*$5,950,000*	$0	$0	0%	$0	$0	$0	$3,900,000	$0	$0	$0	$0
Total	**$17,513,365**	**$7,685,965**	**$3,877,401**	**22%**	**$1,684,901**	**$0**	**$0**	**$3,900,000**	**$0**	**$0**	**$0**	**$150,000**
Falcon Ridge Water System Renewal												
Water Meters	$31,374	$12,549	$18,824	60%	$0	$0	$0	$0	$0	$0	$0	$0
Water Mains	$2,278,668	$720,306	$1,558,362	68%	$0	$0	$0	$0	$0	$0	$0	$0
Facilities	$1,746,300	$421,016	$1,325,284	84%	$165,000	$0	$0	$0	$0	$0	$0	$0
Planned Improvements	*$150,000*	$0	$0	0%	$0	$0	$0	$0	$0	$0	$0	$150,000
Total	**$4,206,342**	**$1,153,872**	**$2,902,470**	**69%**	**$165,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$150,000**
Total Water	**$62,368,004**	**$17,593,667**	**$32,449,337**	**52%**	**$1,849,901**	**$450,000**	**$0**	**$10,671,556**	**$50,000**	**$0**	**$15,385,259**	**$600,000**
Sanitary Sewer												
Sanitary Sewer System Renewal												
Sewer Mains	$13,374,737	$3,624,483	$9,750,254	73%	$0	$0	$0	$0	$0	$0	$0	$0
Force Mains	$5,977,799	$1,481,081	$4,496,718	75%	$0	$0	$0	$0	$0	$0	$0	$0
Lift Stations	$4,962,750	$2,247,775	$2,714,975	55%	$850,000	$0	$0	$0	$0	$0	$0	$0
Sunset Ranch Sewer Mains	$3,872,645	$519,322	$3,353,323	87%	$0	$0	$0	$0	$0	$0	$0	$0
Treatment	$56,381,162	$19,694,125	$36,687,036	65%	$7,636,441	$0	$0	$0	$0	$0	$0	$0
Total	**$84,569,093**	**$27,566,787**	**$57,002,307**	**67%**	**$8,486,441**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Solid Waste												
Solid Waste Renewal												
Curbside Carts	$11,039,244	$5,102,825	$5,936,419	54%	$0	$0	$0	$0	$0	$0	$0	$0
Transfer Stations	$643,318	$406,612	$236,706	37%	$0	$13,997	$0	$0	$0	$451,247	$0	$0
Total	**$11,682,562**	**$5,509,438**	**$6,173,124**	**53%**	**$0**	**$13,997**	**$0**	**$0**	**$0**	**$451,247**	**$0**	**$0**

Investment Year (Current Dollars)													2017 Reserve Balances	20 Year Total	20 Year Average Annual Investment	Average Annual Life Cycle Investment (AALCI)
2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037				
$0	$0	$0	$0	$0	$55,419	$0	$0	$0	$0	$0	$0	$0		$55,419	$2,771	$2,771
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$87,513
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$300,000	$0	$0		$300,000	$15,000	$81,861
$0	**$0**	**$0**	**$0**	**$0**	**$55,419**	**$0**	**$0**	**$0**	**$0**	**$300,000**	**$0**	**$0**	**$308,711**	**$355,419**	**$17,771**	**$172,145**
$0	$0	$0	$0	$0	$6,424	$0	$0	$0	$0	$0	$0	$0		$6,424	$321	$321
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$2,518
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$200,000	$0	$0		$200,000	$10,000	$6,875
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$50,000	$6,250	$4,250
$0	**$0**	**$0**	**$0**	**$0**	**$6,424**	**$0**	**$0**	**$0**	**$0**	**$200,000**	**$0**	**$0**	**$2,890**	**$256,424**	**$16,571**	**$13,965**
$0	$0	$0	$0	$0	$95,544	$0	$0	$0	$0	$0	$0	$0		$95,544	$4,777	$4,777
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$59,204
$0	$0	$400,000	$0	$251,750	$0	$0	$0	$0	$0	$0	$0	$0		$651,750	$32,588	$60,345
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$3,750	$3,000
$0	**$0**	**$400,000**	**$0**	**$251,750**	**$95,544**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$328,697**	**$747,294**	**$41,115**	**$127,326**
$0	$0	$0	$0	$0	$217,859	$0	$0	$0	$0	$0	$0	$0		$217,859	$10,893	$10,893
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$2,742,803	$137,140	$93,840
$0	$0	$0	$0	$0	$217,859	$0	$0	$0	$0	$0	$0	$0		$16,406,872	$37,500	$65,836
$0	$0	$0	$0	$0	$0	$1,900,000	$0	$0	$0	$0	$0	$0		$0	$301,250	$154,000
$0	**$0**	**$0**	**$0**	**$0**	**$435,718**	**$1,900,000**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$321,550**	**$19,367,533**	**$486,783**	**$324,569**
$0	$0	$0	$0	$0	$164,189	$0	$0	$0	$0	$0	$0	$0		$164,189	$8,209	$8,209
$0	$0	$0	$0	$0	$0	$0	$0	$3,165,744	$0	$4,911,121	$0	$0		$8,786,766	$439,338	$152,838
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$2,100,000	$48,750	$46,945
$0	$0	$0	$0	$0	$0	$1,900,000	$0	$0	$0	$0	$0	$0	$0	$0	$297,500	$151,000
$0	**$0**	**$0**	**$0**	**$0**	**$164,189**	**$1,900,000**	**$0**	**$3,165,744**	**$0**	**$4,911,121**	**$0**	**$0**	**$893,280**	**$11,050,955**	**$793,798**	**$358,992**
$0	$0	$0	$0	$0	$31,374	$0	$0	$0	$0	$0	$0	$0		$31,374	$1,569	$1,569
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$24,838
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$10,750	$28,116
$0	$0	$0	$0	$50,000	$0	$0	$0	$0	$0	$0	$0	$0		$215,000	$7,500	$6,000
$0	**$0**	**$0**	**$0**	**$50,000**	**$31,374**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$6,512**	**$246,374**	**$19,819**	**$60,523**
$0	**$0**	**$400,000**	**$0**	**$301,750**	**$788,667**	**$3,800,000**	**$0**	**$3,165,744**	**$0**	**$5,411,121**	**$0**	**$0**		**$32,023,999**	**$1,375,856**	**$1,057,520**
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$452,119	$0	$0	$141,785
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$75,698
$0	$0	$0	$0	$0	$1,076,750	$0	$0	$0	$0	$0	$0	$81,000		$1,157,750	$57,888	$137,325
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0		$0	$0	$38,798
$2,830,441	$4,390,399	$0	$0	$0	$0	$0	$0	$14,443,692	$0	$675,000	$0	$0	$327,918	$29,975,973	$1,498,799	$1,828,863
$2,830,441	**$4,390,399**	**$0**	**$0**	**$0**	**$1,076,750**	**$0**	**$0**	**$14,443,692**	**$0**	**$675,000**	**$0**	**$81,000**	**$780,037**	**$31,133,723**	**$1,556,686**	**$2,222,469**
$0	$0	$0	$9,628,749	$114,750	$0	$114,099	$93,750	$218,700	$152,820	$237,540	$478,836	$0		$11,039,244	$551,962	$551,962
$0	$0	$0	$0	$0	$0	$0	$0	$4,060	$50,014	$99,000	$0	$0	$78,874	$618,318	$30,916	$31,866
$0	**$0**	**$0**	**$9,628,749**	**$114,750**	**$0**	**$114,099**	**$93,750**	**$222,760**	**$202,834**	**$336,540**	**$478,836**	**$0**	**$78,874**	**$11,657,562**	**$582,878**	**$583,828**

APPENDIX B

INPUTS

UNIT COST DERIVATION

The following is intended to outline how the unit costs included in the Asset Management Investment Plan were developed. The primary basis for most unit costs for the water and sewer assets is based on recently tendered projects in the Central Okanagan region.

Sanitary Sewer

Inputs

Pipe, Appurtenances (connection, manholes, services), road restoration, removals, engineering and contingency

In order to determine a per metre price, it was assumed a 100m long segment would include:

- 1 manhole (incl. 1m riser), 1 tie-in connection, 6 services
- 3.5m wide trench wide- asphalt removal, trench restoration, and asphalt restoration
- Soft Costs- engineering and contingency

Pipe

Per metre price:

Diameter (mm)	Unit Cost	Diameter (mm)	Unit Cost
200	$165	525	$410
250	$170	600	$500
300	$205	750	$640
350	$235	900	$790
375	$235	1050	$950
450	$320	1200	$1,350

Appurtenances

6 services (assume 10m long c/w IC) = (6 x $2,600ea) /100m = $156.00/m

1 Connection = (1 x $3,500 ea) /100m = $35.00/m

1 Manhole = (1 x $3,505 ea) /100m = 35.05/m

Total = $226.05/m

Road Restoration (3.5m wide trench per metre of pipe)

Asphalt (assume 75mm thick unit price)
$25.30m2 x 3.5m x 1m = $88.55 /m

Base gravel (assume 100m thick)
$51.28 m3 x 3.5m x 1m x 0.1m = $17.95/m

Total = $106.50/m

Removals (3.5m wide trench per metre of pipe)

Asphalt removal
$4.28 m2 x 3.5m x 1m = $14.98/m

Engineering & Contingency

Design - 7%, CA - 8%, Contingency – 20% = 35%

Total per m = Pipe cost per metre + $226.05 + $106.50 + $14.98 + 40%

Water

Inputs

Pipe, Appurtenances (connection, fittings, services), road restoration, removals, engineering and contingency

In order to determine a per metre price, it was assumed a 100m long segment would include:

- 4 fittings, 2 tie-in connections, 6 services
- 3.5m wide trench wide- asphalt removal, trench restoration, and asphalt restoration
- Soft Costs- engineering and contingency

Pipe

Per metre price:

Diameter (mm)	Unit Cost	Diameter (mm)	Unit Cost
50	$60	350	$250
100	$120	375	$325
150	$140	400	$420
200	$165	450	$470
250	$210	525	$510
300	$240	600	$600

Appurtenances

6 services (assume 10m long c/w IC) = (6 x $2,600 ea) /100m= $156.00/m

2 Connections = (2 x $3,000 ea)/100m = $60.00/m

4 Fittings = (4 x $750 ea) /100m = $30.00/m

Total = $246.00/m

Road Restoration (3.5m wide trench per metre of pipe.)

- Asphalt (assume 75mm thick unit price)
  $25.30m2 x 3.5m x 1m = $88.55 /m
- Base gravel (assume 100m thick)
  $51.28 m3 x 3.5m x 1m x 0.1m = $17.95/m

Total = $106.50/m

Removals (3.5m wide trench per metre of pipe).

- Asphalt removal
  $4.28 m2 x 3.5m x 1m = $14.98/m

Engineering & Contingency

Design -7%, CA-8%, Contingency – 20% = 35%

Total per m = Pipe cost per metre + $246.00 + $106.50 + $14.98 + 40%

APPENDIX B

Service Life Estimates

The service life of an asset such as a pipe depends on many factors such as the materials it is constructed from, the properties of the soils that it is buried in, how it was installed and many, many other factors. For this reason, lifespan estimates are generally based on “rule of thumb” values. Most rule of thumb lifespans applied by engineers are conservative (on the safe side). In reality many assets could actually last much longer (50% longer or possibly more) than these estimates. The following tables summarize the “rule of thumb” values utilized in the AMIP.

The unit costs and service life estimates for the WWTP have been provided under separate cover. Unit costs for solid waste and other assets not included above will be based on historical cost (from invoices or TCA spreadsheets) and increased to 2017 dollars using the Engineering News record (ENR) cost increase factors.

Sanitary Sewer System	
Pipe Material	Life Expectancy (years)
AC	70
CONC	70
VCT	70
STEEL	70
PVC/HDPE	100
Component	
Pump Stations – Short lived	25
Pump Stations – Long Lived	80

Water Distribution System	
Pipe Material	Life Expectancy (years)
AC	80
CI	80
DI	60
COPPER	60
GALV	40
STEEL	60
Polyethylene	80
HDPE	80
PVC	100
Component	
Wells/Pumps/Treatment	25
Reservoirs	80
Flow Meters	30
Appurtenances	20