ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

West Coast Landfill

2022 ANNUAL REPORT

Submitted to British Columbia Ministry of Environment and Climate Change Strategy

Prepared by the ACRD Community Services Department

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Report Summary

	Reporting Year 2022	Unit
Waste Tonnage Disposed at WCL	7,268	t
Landfill Airspace Consumed	12,130	m^3
Landfill Airspace Remaining	700,114	m^3
Anticipated Closure Date at Current Fill Rate/Density	Approx. 2070	
Waste in Place at Landfill	170,345	t
Leachate Generated & Treated	Not measured	m^3
Landfill Gas Management	none	
Closure Works Undertaken	none	
Inspection Works	Formal Inspection March 16, 2022	
Changes from Approved Plans	None	
Ministry Non-Compliances	Requirement for Active OMRR registration not met. MOE missing leachate overflow piping documentation and contaminated soil.	
Progress on Non-Compliances	From 2022: • Registration submitted, acknowledged by MOECCS Aug. 29, 2022. Ops plan for organics outstanding. • Leachate overflow documentation required. • Confirmation of contaminated soil required.	

WCL Waste Shed Projects Undertaken in 2022	Future Projects/Initiatives Proposed
Organics/3-stream Curbside Collection Expansion of Curbside to Tla-o-qui-aht First Nation and Yuułuʔiłʔatḥ WC Solid Waste Collection Bylaw LF Upgrades/Organics Composting Facility Waste Reduction Education Landfill Environmental Monitoring Improvements Rope and Netting Project (begun in 2019)	LF Upgrades/Organics Composting Facility (2023) Waste Reduction Education (2023) Update of Solid Waste Management Plan (2023) Waste Composition Study (2023) Tipping Fee Review (2023) Landfill Gas Supplementary Report (2023) Explore Temporary Cover Options (2023/2024) Installation of Flow Monitoring (2023/2024) Organics Ban (2023/2024) Construction and Demolition Waste Diversion (2023/2024) Landfill Ops Contract Extension (2023)/ RFP (2024) Design Operation and Closure Plan Update (2024) Operational Certificate Update (2025) Leachate Treatment Facility (2025/2026)

	Target	Actual
1 - Waste Disposal Rate	< 400 kg/capita	613 kg/capita
2- Diversion of Waste	>50%	22%
3 - Airspace Consumption Ratio	>750 kg/m^3	**757 kg/m^3**
4 – Capital Contributions	>$70,000/year	$126,000
5 – Water Quality	Meet FWAL	Not met
6 – Landfill Gas Generation	<1,000 tonnes CH_4/year	Est. 339 tonnes CH_4/year

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Background

The Alberni-Clayoquot Regional District (ACRD) operates the West Coast Landfill (WCL) under the British Columbia Waste Management Act Operational Certificate Number OC-5634, issued April 12, 2005. The "waste shed" for municipal solid waste destined for the WCL includes the District of Tofino, District of Ucluelet, Parks Canada, ACRD Electoral District C - Long Beach, Millstream and Port Albion and the First Nations communities of the Toquaht, Yuułuʔiłʔatḥ, Ahousaht, Tla-o-qui-aht, and Hesquiaht. The WCL is located approximately 9 km northwest of the Tofino-Ucluelet junction, on the east side of the highway, along Alaska Pine Road. The WCL has been operational since 1980.

This report was prepared by staff at the ACRD to satisfy the annual reporting requirements for the WCL, as required by the Operational Certificate and the 2016 Landfill Criteria for Municipal Solid Waste published by BC Ministry of Environment and Climate Change Strategy (MOECCS). The report has been reviewed by solid waste engineers from Tetra Tech Canada Inc. that are familiar with the facility and operations. The content of the Annual Report and supporting materials were reviewed by Tetra Tech Canada Inc. in conjunction with the ACRD staff prior to the report being finalized.

Mission Statement

"To protect human health and the environment and maximize value of service by effectively managing the region's solid waste in an environmentally, socially and economically responsible manner."

Waste Quantification

Landfilled

In 2022, the WCL accepted 7,268 tonnes of municipal solid waste (MSW) and construction and demolition (C&D) waste as shown in Table 1. The cumulative waste in place at the WCL as of the end of 2022 is 170,345 tonnes.

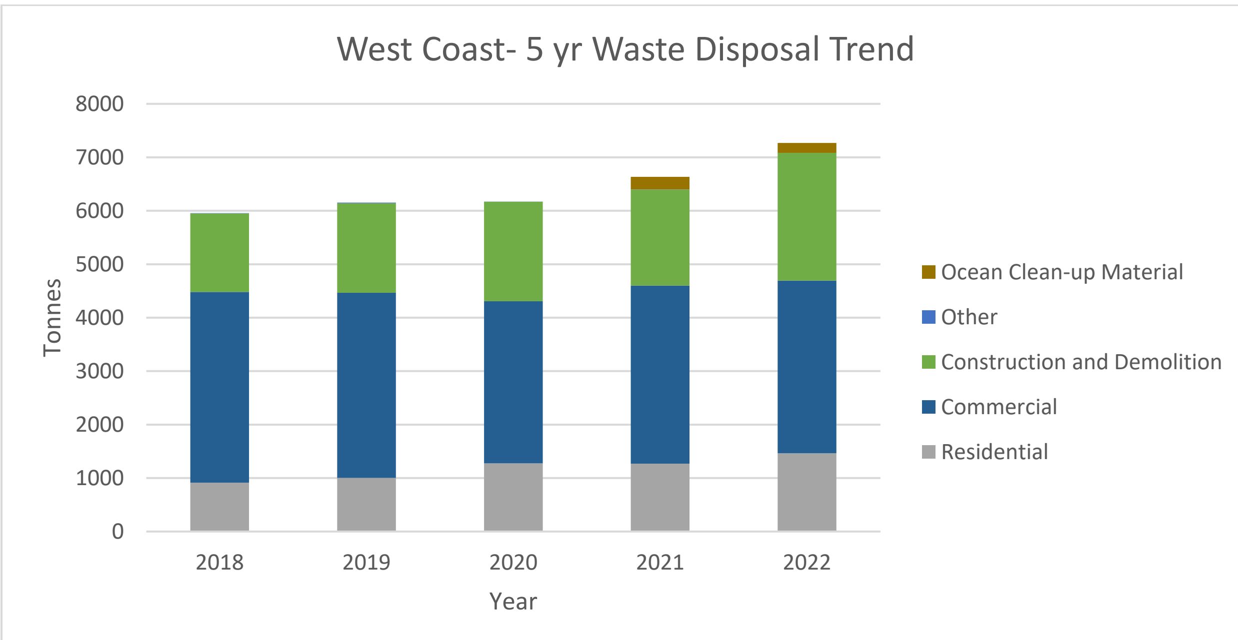
Table 1 - Waste disposed in 2022

Waste Breakdown	Tonnes	Percentage
Residential Garbage	1,465	20%
Commercial Garbage	3,229	44%
Construction and Demolition	2,388	33%
Other Garbage	0	0%
Ocean Clean-up Material	185	3%
TOTAL	**7,268**	100%

The largest source of solid waste disposed on the West Coast is collected from the commercial sector. This sector includes resorts, hotels, restaurants, retail and other businesses; making up 44% of all waste that is landfilled. The residential sector produces 20% of the waste which includes materials collected at the curbside and materials self-hauled by residents to the landfill. Construction and demolition (C&D) waste makes up a relatively large portion of the waste stream at 33% (higher than the Alberni Valley Sort'nGo Centre rate of 25%) which includes roofing, drywall, and wood materials. A year over year comparison of waste processed through the WCL was compiled over a five-year period (Chart 1 below). The key trends are:

- The quantity of residential waste disposed has increased slightly the last five years due to the uptick in private vacation rentals, including Airbnb's.
- Commercial waste tonnages have reduced slightly compared to 5 years ago.
- Ocean Clean-up materials coming into the site decreased from the previous year.
- C&D Waste has increased in the five-year timeframe with a large increase noted in 2022, likely due to the demolition of an older school building in Ucluelet.

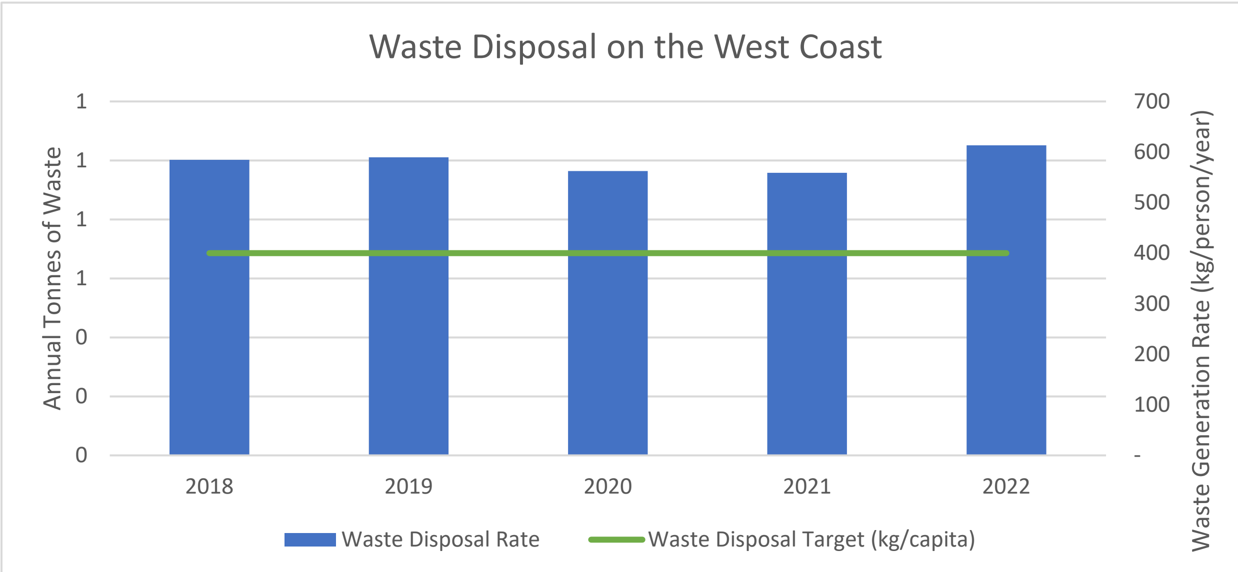
Chart 1 – 5 Year Waste Disposal Trend on the West Coast



The estimated permanent population served by the landfill in 2022 was 7,039. However, the West Coast has a significantly higher equivalent population due to the strong tourism sector. Equivalent population estimates put the total population to be 40% higher. With an average 3% increase in permanent population over the last 5 years[1], the revised equivalent population was 11,788 in 2022. This results in a disposal rate of 613 kg/capita per year which is greater than 2021 (560 kg/capita). This is still well in excess of the target of 400 kg/capital as shown in Chart 2.

[1] BC Population Statistics, Districts of Tofino & Ucluelet.

Chart 2- Waste Disposal 2022



Target–1 - Reduce waste disposal to less than 400 kg/capita

Several projects are planned or have been implemented to assist in the goal of reducing per capita waste disposal, including:

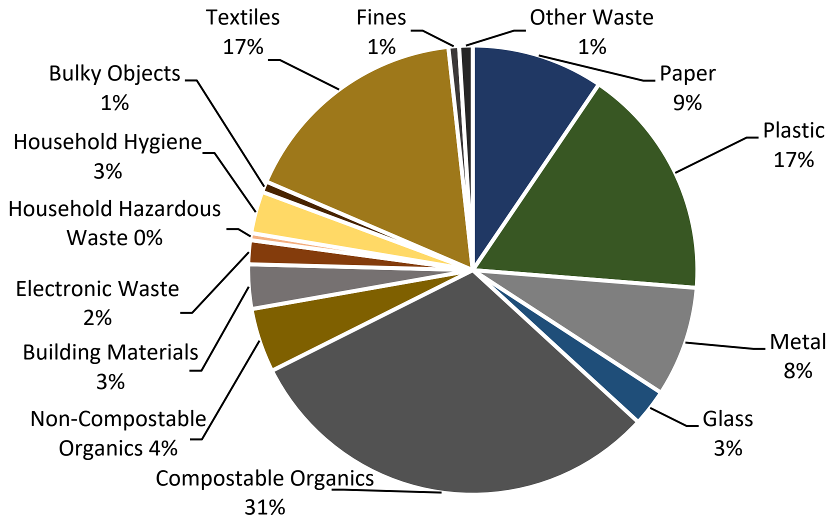
- The rollout of 3-stream curbside collection in December 2022;
- The recent installation of a new organics processing facility commissioned in Spring 2023;
- A waste composition audit slated for 2023; and
- The update of the Solid Waste Management Plan which will investigate other options, such as Construction and Demolition waste diversion

These projects are described later in this report.

Waste Composition Audits

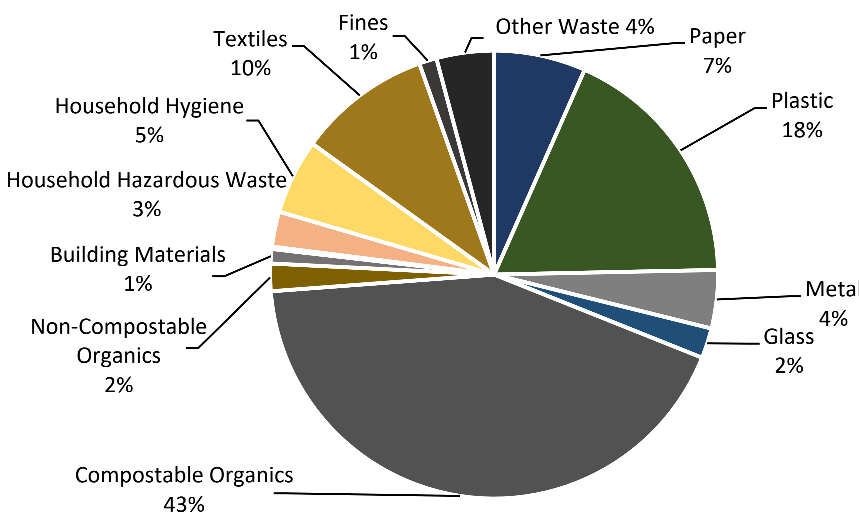
In 2019, the ACRD completed a Waste Composition Study to determine the make-up of materials in the garbage streams for curbside residential, self-haul and commercial waste. Charts 2 & 3 illustrate the weighted average material composition for commercial and residential curbside garbage with compostable organics as the single biggest contributor to landfill waste at the time of the study in 2019.

Chart 2 - WCL Commercial Waste Composition 2019



The commercial waste stream was found to have an average composition of 31% compostable materials and 29% recyclable materials.

Chart 3 - WCL Residential Curbside Waste Composition 2019



The residential curbside waste stream consisted of approximately 43% compostable and 21% recyclable materials. Garbage that was self-hauled by residents had a much lower percentage of organic material; this is because very few residents self-haul their waste to the West Coast Landfill unless they are also disposing of bulky items such as furniture.

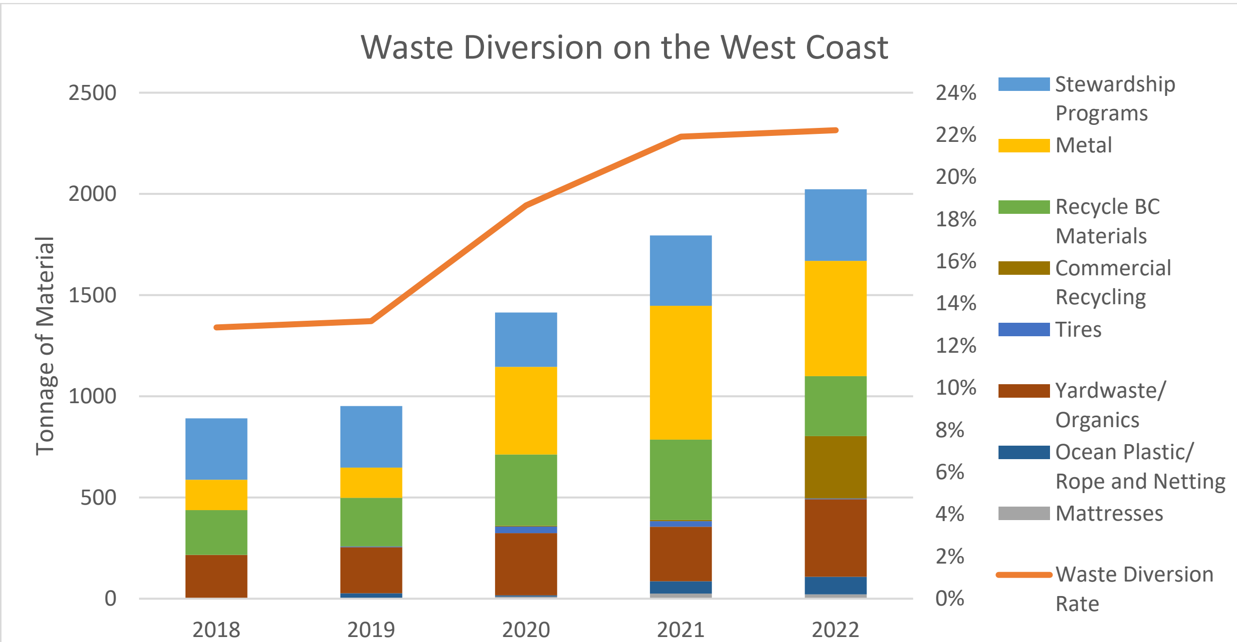
In 2021, the values from the original study were used to project an estimated 31 % of landfilled waste was available to be diverted (2,944 tonnes[2]). The onset of the new residential 3-stream curbside collection program and installation of a new organics facility at the WCL was created to address this issue and support Target 1. A new Waste Composition Audit is planned for 2023.

[2] 2021 WCL Annual Report

Diverted

In 2022 good progress was made in improving the collection of data on waste diverted from disposal. This progress was made largely outside of the EPR programs. The quantity of materials measured as being diverted from landfilling in 2022 was 2,023 tonnes of which 1,072 tonnes was collected directly at the landfill. The diversion rate is influenced by both the amount of materials collected through recycling programs and the amount of waste going to landfill, as shown in Chart 5, below.

Chart 5 - Annual Waste Diversion Rates 2022



Key takeaways include:

- Metal recycling remains high since 2019, though tonnage dropped from 2021-2022.
- There was a decrease in the Recycle BC material tonnages diverted in 2022. This was likely due to changes in operating hours for the private depots in Ucluelet and Tofino.
- There was a slight improvement overall in stewardship tonnages diverted from landfill.
- A new category of commercial recycling was noted, due to data not previously available from private haulers. ACRD staff has established connection with local haulers to track this data moving forward.
- An increase in organics waste, covered in the next section.

West Coast Sort’nGo - 3-Stream Curbside Collection and Organics

In 2022 staff put a significant amount of effort into the introduction of organics diversion on the West Coast through the ACRD’s new Sort’nGo program (previously established in the Alberni Valley).

The new West Coast Sort’nGo program specifically targeted organics diversion by focusing on:

1. Adding organics collection to the existing residential curbside program; and,
2. Constructing a -new tipping wall and organics processing capacity at the WCL.

To support this work, the ACRD received a $6-million grant through the Federal Strategic Priorities Gas Tax Fund. The funds paid for the bulk of the landfill upgrades as well as organics processing capacity at the West Coast landfill and the implementation of Phase 2 of the regional organics implementation project that was rollout out during the winter of 2022.

During the initial planning stages of the west coast project, the ACRD staff initiated a Sort'nGo working group that included regular meetings to vet decisions around the various policy and operational components of the service. The working group was made up of staff from Yuułuʔiłʔatḥ (UFN) and Tla-o-qui-aht First Nation (TLFN) Public Works, District of Ucluelet, District of Tofino, Tofino Urban Farms, Surfrider and Zinc Strategies (Zinc). A large-scale strategy to develop the program, is defined by the following elements.

Engagement

The ACRD, with the support of Zinc Strategies, developed the public engagement strategy that focused on three phases: pre-implementation, implementation, and post implementation. The strategy included communication tools and program materials developed to support the changes to the upcoming waste services. Each phase of the strategy included promotion, education, and outreach tools designed to set residents up for success with the introduction and use of organics diversion and automated cart collection. Websites, videos, key messages, and FAQs were developed amongst other tools to support, educate, and help staff monitor the expanded waste service.

Post implementation engagement include residential waste audits and cart tagging that will identify common contamination issues and provide diversion data that will inform educational campaigns targeted at residents to assist with continued improvements of the service. Key findings from these tactics continue to be communicated to residents of the West Coast through social media, Westerly News articles, and other media outlets.

Ongoing Operations

Ozzard Environmental holds the current curbside recycling collection contract for households within the ACRD boundaries. As part of the transition to three-stream automatic waste collection, Ozzard has converted to automated collection trucks to complete the collection of organics (weekly), recycling (bi-weekly) and garbage (bi-weekly). The transition to fully automated collection has provided numerous benefits including, improved waste diversion, reduced neighborhood litter, dry recyclable materials, customer service improvements due to use of the collection carts, enhanced community aesthetics with the standardized carts, collection time efficiencies and the reduction of health and safety issues i.e., repetitive motion from manual collection from over 1,700 households.

Collection Trucks

Each truck has been outfitted with an on-board computer system, called "Prairie Robotics" with artificial intelligence technology capabilities that help track property-specific contamination issues and confirm missed collection inquires. This software has recently been installed and ACRD staff is undertaking training to ensure the functions can be maximized and used as a helpful tool to provide an important educational component to the service.

Carts

The default cart sizes for waste collection are 120 L for Garbage, 240 L for Recycling and 120L for organics with wildlife proof mechanisms included as a specification requirement. The size selection was based on waste audits done in the community and ensuring enough room for the average home's recycling (since all materials need to fit inside the cart). However, given the high volume of vacation rentals, Airbnb's and staff accommodations, additional size options for garbage and organics were offered to homeowners at additional cost associated to the type and size of cart option.

Engagement for cart size options began in January 2022 asking residents to provide their preference of size options prior to the cart order being placed to guarantee their preferred cart size options. Since implementation of the Sort'nGo waste service, the ACRD has received request for larger capacity garbage carts and the ACRD is honoring these requests on a first come first served request basis while inventory lasts.

Cart Deliveries

ACRD staff collaborated with members from TLFN and UFN to assist with cart deliveries for both the First Nations pilot and the full West Coast rollout. Community members and additional volunteers delivered over 4,500 carts to 1,700 households over 10 days. Along with labor support, TFN also assisted with cart storage, equipment provisions and extended cart delivery services. The social procurement aspect of this project allowed the ACRD to support the first nations communities and also use community groups like the Wickaninnish Parent Advisory Committee (PAC) group for welcome package assembly.

Education

Surfrider Pacific Rim Chapter has played a key role in assisting with education and outreach efforts prior to the rollout of the Sort'nGo program. As the Sort'nGo service has expanded to organics, a more in-depth approach to the three-stream waste diversion and education will be required. This approach will include activities such as actively managing contamination and keeping abreast of the busy tourist season and waste fluctuation.

Additional Highlights

- Update of the ACRD Solid Waste Bylaw for the West Coast;
- Converting the existing curbside program in Districts of Ucluelet and Tofino to 3-stream automated cart collection;
- Introducing 3-stream collection into the First Nation communities of Hitaċu, Esowista and TyHistanis;
- Development of the Sort'nGo brand and the "letsconnectACRD" online hub to host information to prepare residents for the new program;
- Retendering and redesign of capital works mid-year to meet our goals in direct response to inflated contractor and fuel costs which occurred due to the COVID-19 pandemic; extreme weather; and supply chain demand.
- Securing funding through the Strategic Priorities Grant for capital works at the landfill and purchase of automated collection carts; and
- Registering the new organics facility with the MOECCS.

This new program achieved many successes, including:

- Onboarding 1,730 homes with new carts (and counting);
- Working with language specialists in Yuułuʔiłʔatḥ (UFN) and Tla-o-qui-aht (TLFN) First Nations to develop new outreach material with traditional language terms for waste diversion; and
- Diverting 109 tonnes of organic material in the first month of roll-out.

See Chart 6 and Chart 7 below, which show preliminary data for December 2022 and the initial months of 2023.

Chart 6 –3-Stream Curbside Collection December 1, 2022 to March 31, 2023 (by weight)

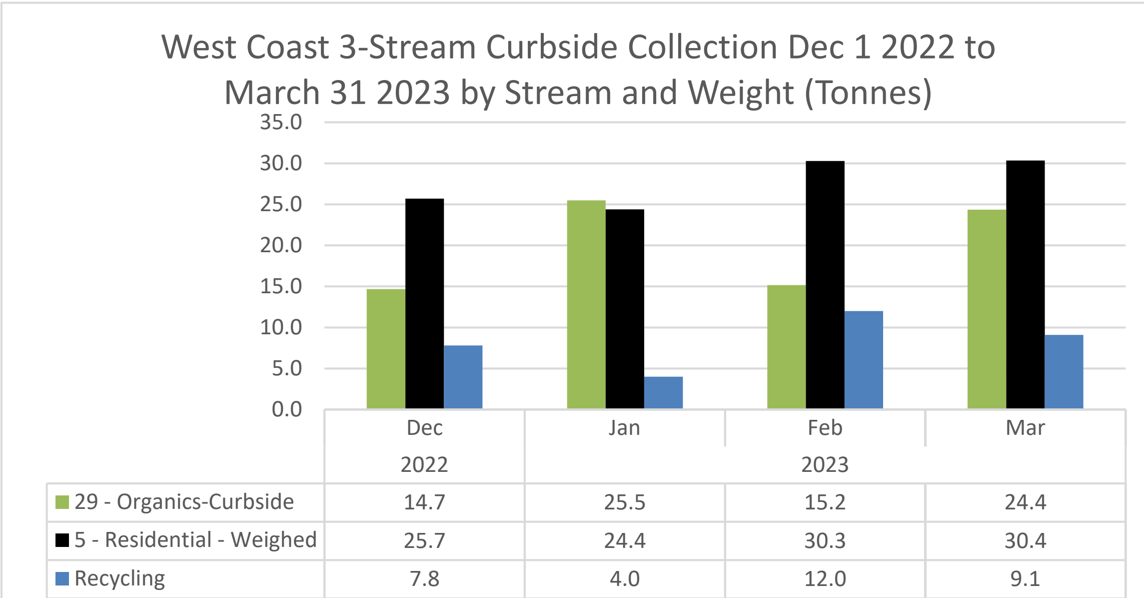
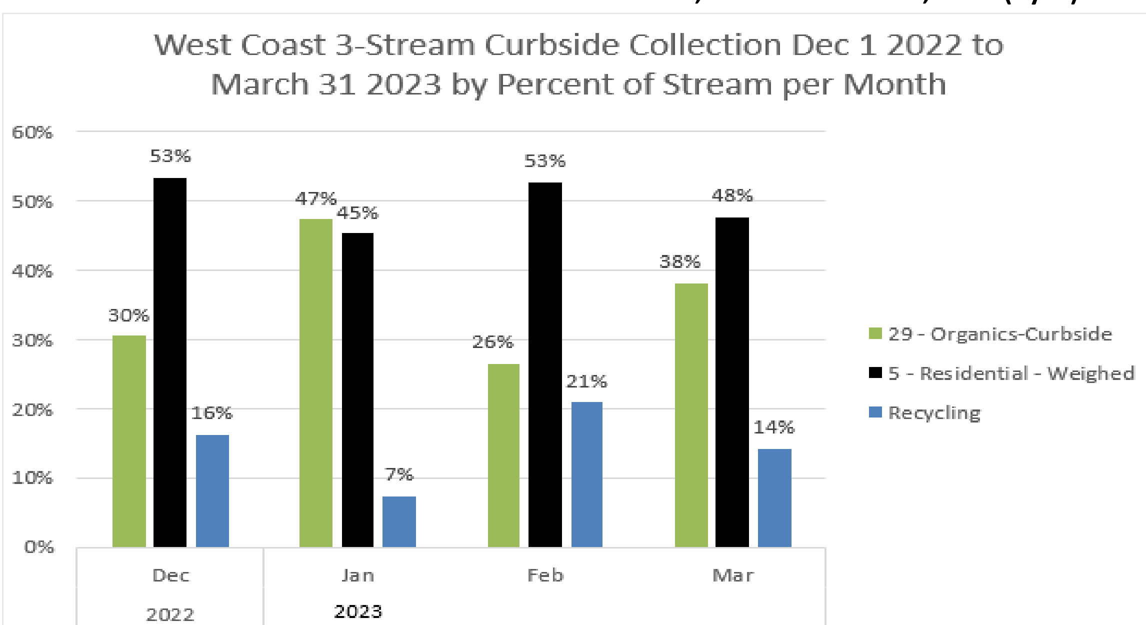


Chart 7 –3-Stream Curbside Collection December 1, 2022 to March 31, 2023 (by %)



Other expanded waste diversion programs also contributed to the trends shown above.

Recycling of ocean plastic debris, begun in 2021, continued in 2022 through partnerships between the ACRD and the Ocean Legacy Foundation as well as the ACRD and Surfrider Foundation. Surfrider spearheads ocean debris collection from coastline clean up events, feeding rope, netting and ocean plastics debris through the WCL for diversion to Ocean Legacy. From there, Ocean Legacy take diverted material and recycle it into feedstock for new products such as signboards. As a result of these efforts:

- 67.5 tonnes of ocean plastics were collected in 2022, compared to 13.7 tonnes in 2021;
- 19.4 tonnes of rope and netting were collected in 2022, compared to 47.5 tonnes in 2021

Mattress recycling, begun in mid-2021 in partnership with Recycle Matters, saw another 21.5 tonnes of mattresses diverted from landfilling in 2022, compared to 25 tonnes the previous year. This diversion is important not only for environmental reasons, but mattresses are also difficult to manage in disposal. To date, nearly 2,400 mattresses have been diverted from landfilling This is an important success in a region in with a strong hospitality industry.

Bicycles are also diverted for reuse. A dedicated storage shed is provided so that bikes may be reused whole or in part. The tonnages are small, but it is an important statement that they may be reused and are not disposable items.

The ACRD contracted the WCL waste reduction education services to Surfrider Pacific Rim Chapter which is present in both Tofino and Ucluelet. The waste reduction education program run by Surfrider has three main thrusts:

1. Eliminating single-use and unnecessary plastics;
2. Materializing a localized circular economy; and
3. Engaging youth, businesses, the public and all levels of government in ocean-friendly initiatives.

These additional diversion efforts have resulted in a diversion rate of approximately 22%, that is up slightly from 2021. However, this diversion rate is still low compared to the target set in the solid waste management plan of 50% and is artificially increased due to commercial recycling data that was not previously available. Staff continue to investigate additional diversion options and monitor the recent organics rollout in early December 2022, which is expected to contribute significantly to meeting this goal.

Target 2 - Increase Diversion of Waste to 50%

The two largest potential diversion opportunities on the West Coast are organics and improved commercial recycling. Other opportunities for diversion streams on the west coast could include residual drywall (demo projects), and other construction waste materials.

Landfill Capacity

Airspace Utilization

In 2022 the WCL consumed 9,600 m^3 of airspace based on the annual topographical survey completed at year end. With a total tonnage disposed of 6,632 tonnes, that results in an airspace consumption ratio of 757 kg/m^3, meeting our minimum target of 750 kg/m^3, an important success. This is a large increase compared to the five-year average of 560 kg/m^3 and is comparable to neighboring landfills that average 730 kg/m^3.

The volume of cover material used in 2022 was estimated at 2,662 m^3, a significant reduction in airspace consumption from 2021 (4,381 m^3). This increase in airspace consumption density was a result of both beneficial changes in operational methods for landfilling at the site as well as refinements in data calculations on cover utilization.

Target 3 – Minimum Airspace Consumption Ratio of 600 kg/m3

Remaining Life

Based on the airspace consumed in 2022, there is an estimated 690,514 m^3 of airspace remaining at the WCL. Based on the current population growth rate of 3%, waste generation of 613 kg/capita and airspace consumption ratio of 757 kg/m^3, the landfill will reach capacity near 2062. However, if the target for reducing waste disposal to 400 kg/person is met and minimum airspace consumption ratios continues to be met or exceeded, the landfill lifespan has the potential to extend to approximately 2070 and beyond.

Operations

Variations from DOCP

The last Design, Operations and Closure Plan (DOCP) was completed in 2012 by McGill and Associates Engineering and requires an update.

Exceptions from the 2012 plan include overflow ('decant") events from the leachate holding lagoon. The current system was designed to capture the leachate generated on site. That leachate is then applied to an irrigation field. In 2015 Solinst Leveloggers were installed in the overflow pipes from the leachate lagoon to record overflow events. In 2022 there were 16 decant events as detailed in the Environmental Monitoring completed by Piteau and Associates. By comparison, there were 11 events in 2021 and 19 in 2020. The overflow events in all these years occurred during the winter months following winter storms. The pumping system has not had sufficient capacity to discharge the lagoon to accommodate the inflow of leachate coupled with extreme amounts of surface run-off that are experienced across the site and especially in the irrigation area.

Surface water discharged at the time of the decant events is typically sampled and analyzed as part of the environmental monitoring program. However due to safety concerns no samples were collected in 2022 as detailed in the 2022 Monitoring Report West Coast Landfill. Sample collection and analysis will resume in 2023.

Conformance to SWMP

The most recently adopted Solid Waste Management Plan (SWMP) from 2008[3], listed several initiatives to meet the first two targets in the report; reduce per capita waste generation to 400 kg/person; and increase diversion to 50%. Most of these initiatives have been implemented, including the recent initiation of curbside organics diversion on the West Coast. However, organics diversion for the

[3] Reviewed in 2014 and 2017.

commercial sector needs to be expanded from pilot stage and options for remote communities is still outstanding. The ACRD will be moving forward with the SWMP update in 2023 to review and update the targets and initiatives for this service (see projects section of this report).

Compliance Resolutions

The ACRD received an inspection on March 16, 2022. The WCL was shown to comply with the Hazardous Waste Regulation but did receive an advisory notice for 3 items:

- Registration with the Organic Matter Recycling Regulation (OMRR) for the time of the inspection. While minor, the MOECCS noted that small volume composting operations are required to have a registration on file, though these operations will not trigger a permit due to their size. A registration was submitted to capture the new organics facility and response was received from the MOECCS in August, 2022.
- Use of previously accepted soils that do not meet the Contaminated Sites Regulation standards for Industrial Land Use as interim cover materials. ACRD staff are communicating with MOECCS regarding correspondence on this topic that occurred in 2021 to confirm that the correct notifications were provided.
- Instances of leachate at the property boundary not meeting British Columbia Approved Water Quality Guidelines and Working Water Quality Guidelines. Continued monitoring of leachate lagoon overflow (decant) events including acute toxicity to fish will be completed as recommended in the 2022 Annual Environmental Monitoring Report. Design for an upgraded leachate treatment system will be completed in 2024/2025 with construction to follow.
- Documentation for leachate overflow piping not captured in MOECCS records including the WCL Operational Certificate No. 5634. Staff is working to establish a timeline and expectations for updating documentation and infrastructure upgrades. The Operational Certificate is expected to be amended if required following completion of the DOCP update in 2023/2024.

Complaints

The ACRD did not receive any documented community complaints regarding the operation of the landfill in 2022. It is beneficial that the landfill is located a significant distance from any residential communities, though staff engage with Parks Canada as the immediate neighbour to the landfill site. Typical complaints associated with other landfills are mainly due to odor and noise, but these are not an issue at the WCL. A formal complaint tracking system is in place to ensure that all complaints are documented and followed up on appropriately, should they occur.

Inspections

As detailed above, the MOECCS visited the site formally in March, 2022. Internally, the Solid Waste team began regular visits to the site in 2022, primarily for capital planning as well as oversight inspections to ensure compliance with the contract, operations certificate and ministry requirements. These internal site visits are conducted at least monthly.

Finances

Operating Expenses

In 2022, the operating expenses for the WCL were:

Table 3 - Operating Expenses

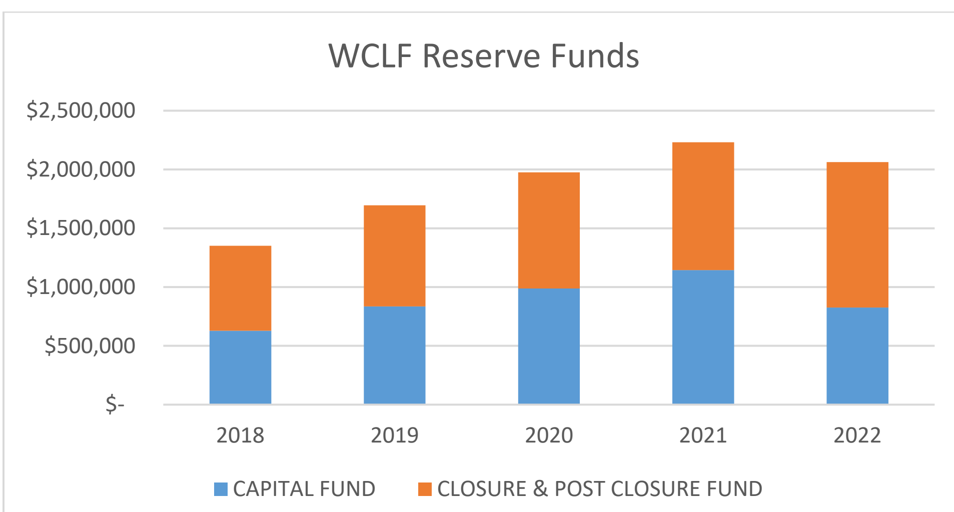
	2022
Landfill Operating Costs	$829,287
Admin & Education Costs	$228,560
Recycling	$462,179
Total Costs	$1,520,026
Recoveries	$338,361
Net Cost	$1,181,665
Reserve Funds Allocation	$3,174,690

Capital and Closure Funding

Referencing Table 3, above, the allocation of $3.2 million in reserves reflects the sum of $3 million from the Strategic Priorities Grant and $126,000 for the closure/post-closure fund. The Grant monies were expended specifically for the construction at the WCL as well as purchase of new curbside carts for the 3-stream collection program (reference earlier in the "West Coast Sort'nGo" section).

Regarding the closure/post-closure fund, the 2012 West Coast Landfill Design, Operations and Closure Plan (DOCP) identified the need for a fund of $5,600,000 for closure and post-closure activities. There was $1,236,228 in the closure and post closure reserve fund at the end of 2022. Contributions to this fund have exceeded the recommended minimum contribution of $70,000 in each of the past four years. The capital fund shows a significant decrease from 2021 to reflect a capital contribution for the construction for the West Coast Organics Facility.

Chart 8 - Capital Reserve Funds



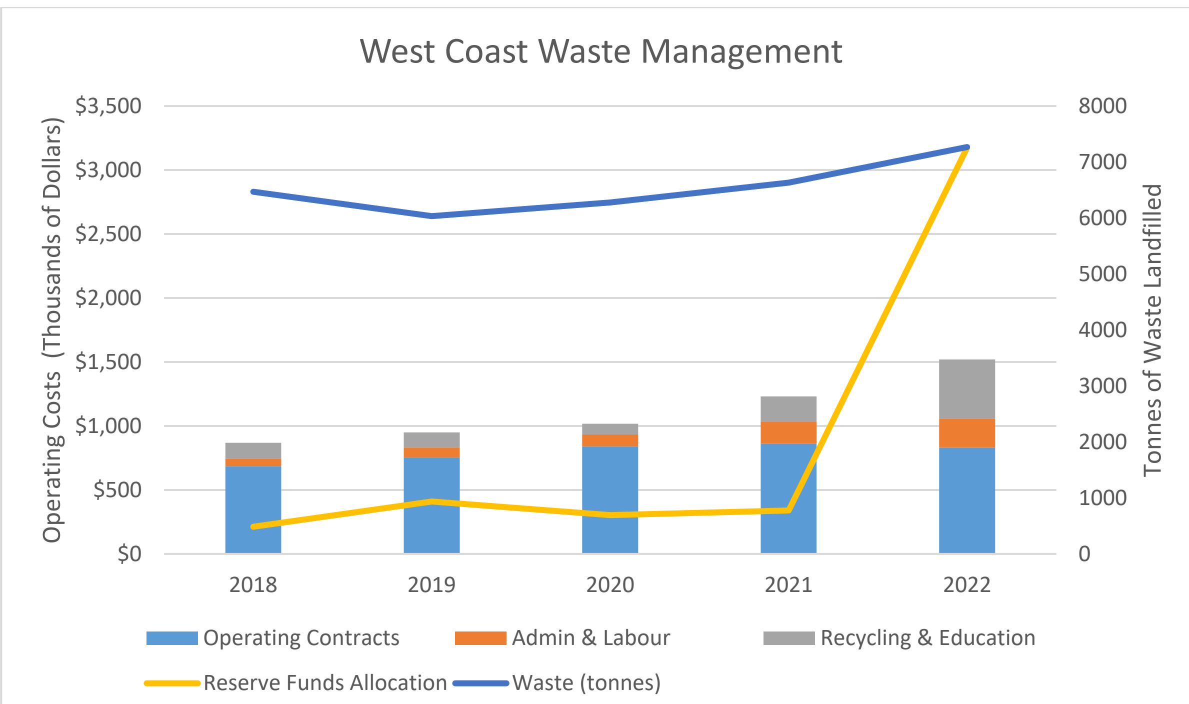
Target 4 – Annual Capital Contributions meet Funding Requirements

The 2012 DOCP assumed an estimated lifespan of 50 years and the potential to extend to 75-80 years with improved diversion and operation, the annual contribution should be between $65,000 to $115,000 per year. With the rollout of organics diversion being completed, the DOCP will need to be updated (see projects section). When the DOCP is updated, it will include a review of capital requirements and closure costs to provide an updated estimate of reserve fund requirements. Until the DOCP is finalized, the contribution to closure/post closure will be kept at least $90,000 to continue building reserves.

Operational Efficiency

Chart 9 below drills down further into the total operating costs including contracts, administration, and support to manage solid waste on the west coast. It covers operation of the WCL, the curbside collection program and education programs. The costs are influenced by inflation and directly influenced by the volume of material landfilled and diverted.

Chart 9 - Annual Costs and Tonnages



Reserve funds jumped by approximately $3 Million in 2022. This reflects the application of the Strategic Priorities Grant Fund in the West Coast 3-stream rollout and construction of the new organics facility. Additionally, cost increases for administration and waste education are also linked to those efforts. Finally, inflation from operating contracts and improving landfill operations to meet regulatory criteria have also contributed to increasing costs. Collectively these efforts have resulted in improved diversion of materials from the waste stream.

Environmental Monitoring

Leachate Monitoring

Leachate is generated when rain falls on the waste mound and comes in contact with the buried waste. The leachate is contained within the waste mound because of the low hydraulic conductivity of the marine clay foundation soils. The leachate is collected by ditches located at the perimeter of the waste mound. These ditches collect leachate that seeps from the edges of the landfill and transport it to a lagoon located on the southwest side of the property. The contents of the lagoon are pumped to the north of the landfill to a spray irrigation field. This field is designed to allow the leachate contaminants to attenuate prior to entering the eventual receiving waters of Sandhill Creek.

The ACRD monitors multiple sites in the leachate collection and irrigation field as well as background locations. The samples were analyzed by an independent laboratory for metals, VOCs, inorganic compounds, pH levels, conductivity, and other water quality parameters from the FWAL (Fresh-Water Aquatic Life) protection criteria. All monitoring data is directly reported to our environmental consultants, Piteau Associates Consulting, for their review and reporting to MOECCS. The Piteau report (2022 Monitoring Report West Coast Landfill) accompanies this report.

Leachate Pond Overflow Monitoring

The west coast of Vancouver Island receives some of the largest recorded annual rainfall in Canada. Much of this precipitation occurs during winter storms. The leachate pond is subject to overflowing (decant events) during, and immediately following, these intense winter storm events. When this occurs, the lagoon decants to the north through pipes installed for that purpose but bypassing the irrigation field. Information from dataloggers that are downloaded twice per year record the number of overflow events and the duration. The majority of the decant events in 2022 were due to above-average rainfall received in the 1st quarter (1,073 mm, nearly 40% of the year's precipitation of 2,800 mm). A future design project is planned for the proposed enhanced leachate management system and will build upon the previously executed feasibility study.

With the development of the Organics Processing Facility, the volume of leachate generated at the facility is expected to increase over the coming years. Conversely, the strength of the leachate generated is expected to decrease with the inclusion of contact water from the compost pad. This may result in additional overflow (decant) events throughout the winter months which will be monitored as discussed above.

Overview of the Monitoring Program

Target 5 – All water leaving the site meets the FWAL criteria

Detailed analysis of monitoring data (provided in the 2022 Monitoring Report West Coast Landfill, Piteau and Associates) concludes there is a continuing slight leachate effect to receiving waters in the vicinity of the West Coast Landfill. However, there are no long-term increasing trends apparent that would suggest the effects of the landfill are increasing over time. This means that the target for having all water leaving the site meet the FWAL criteria was not met. The report recommends continuing the environmental monitoring program with some minor adjustments, as described, and to continue the present approach to monitoring overflow events.

The design objective of the new leachate treatment project is that all water leaving the site meet the FWAL criteria. The recommendations of the monitoring report regarding flow gauging will be reviewed jointly with the project design team. The outcome of those discussions will be incorporated into the project which is being designed to ensure that this target will be met once the new system is commissioned.

The Piteau report also recommends the following:

- Continued decant event sampling to be conducted near the mid-point of the event with one set of samples completed for each week within an event.
- Partial capping of the landfill to reduce leachate quantity, the frequency of overflow events and impacts to the receiving waters.
- Temporary installation of a cumulative flowmeter on the leachate irrigation systems, as well as surveys of the culvert inlets, and continued records of leachate storage lagoon levels.

Until a new leachate treatment system is commissioned, staff are working with consultants to develop assess, plan, and implement operational and infrastructure changes to improve performance of the leachate management system. Additional monitoring and sampling will be completed per the recommendations of the 2022 Annual Environmental Monitoring Report to assist in the design of the new leachate treatment system.

Landfill Gas Monitoring

Target 6 - Landfill Gas Generation Less than 1,000 tonnes/year of methane

The engineering firm McGill and Associates completed a Landfill Gas Assessment Report in 2018. Using the required provincial model, the report estimated that the WCL would be producing 339 tonnes of methane in 2022. In the absence of the actual landfill composition data, this report used the average rural waste characterization data in the Landfill Gas Assessment Tool to calculate these volumes. A waste characterization study completed in the spring of 2019 showed that the WCL waste composition has a lower organic content than was assumed in the previous gas calculations. This predicted reduction will be updated and confirmed in the next Landfill Gas Supplementary Report which will be required in 2023 as per Section 15 of the Landfill Gas Management Regulation.

Other Greenhouse Gas Emissions

Landfilling operations require the use of motorized equipment including small machinery such as power washers, small utility vehicles (ATVs), and pickup trucks, as well as heavy duty machinery such as compactors, graders, and excavators. The fuel used for this equipment is primarily diesel. In 2022, the contractor burned approximately 12,213 liters of diesel in the operation of the landfill which produced the equivalent of 32.2 metric tonnes of CO_2.

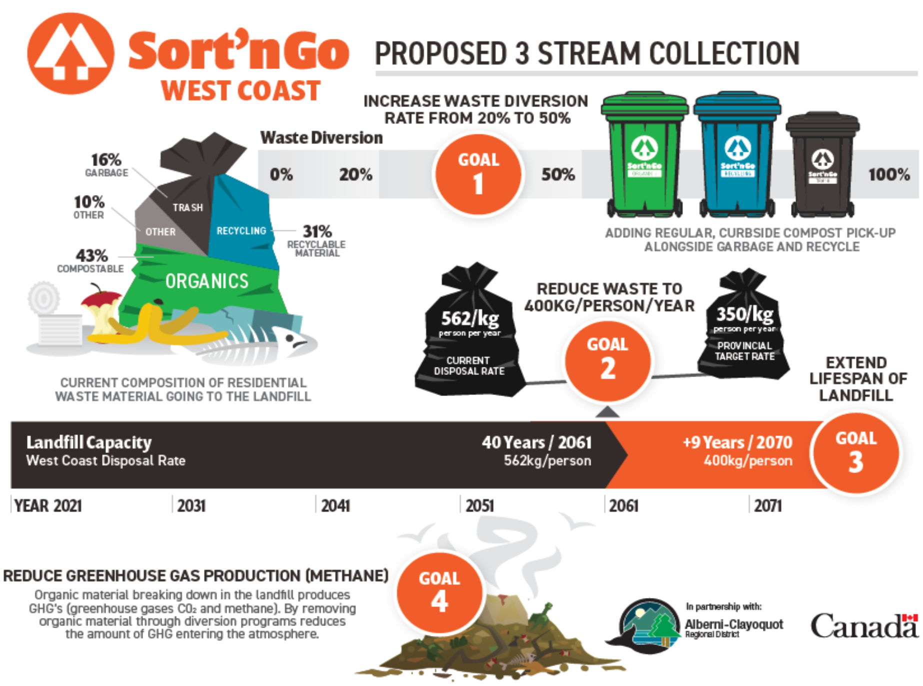
Illegal Dumping

The west coast has experienced illegal dumping with many different types of wastes including yard waste such as leaves and branches as well as household wastes. These items are often found on logging roads surrounding the communities. In 2022 the WCL received 22.4 tonnes of illegally dumped wastes that were collected at community clean-up events. Community clean-up programs will continue to be supported with financial support from the ACRD and other community sponsors.

Projects Completed In 2022

Organics/3-stream Curbside Collection – staff completed public engagement to educate and prepare residents for three-stream curbside collection (garbage, recycling, and organics) via a new automated collection vehicle. As described in the "West Coast Sort'nGo" section earlier in this report, over 1,700 residents in Yuułuʔiłʔatḥ (UFN), Tla-o-qui-aht (TLFN) First Nation, Tofino and Ucluelet were introduced to this exciting new program in December 2022. Nearly 40 tonnes of organics were diverted from landfilling with more to come.

Expansion of Curbside to Tla-o-qui-aht First Nation (TLFN) and Yuułuʔiłʔatḥ (UFN) – As part of the organics working group engagement for 3-stream, the ACRD was successful in establishing service agreements with TLFN and UFN to introduce 3-stream curbside collection to 220 homes in the communities of Hitacu, Esowista and TyHistanis. Each nation recruited a member from their respective communities to provide education outreach for the new program. Additionally, language specialists were able to provide key language terms to help with literature to support education efforts.



WC Solid Waste Collection Bylaw – This update was completed to regulate three-stream (organics, recycling, and garbage) automatic cart collection system, on the West Coast. The new bylaw includes the existing collection service area, provides for service collection fees, additional language around securing waste to prevent human-wildlife conflicts and allows for the ability to expand collection where practicable. The bylaw also includes requirements for commercial businesses to establish a plan for managing and reducing their solid waste.

Landfill Upgrades/Organics Composting Facility – The ACRD tendered a contract for constructing a new and improved public drop area/tipping wall in conjunction with the new organics processing facility. Due to significant over pricing in the world economy as a result of the COVID pandemic, the scope of the project was adjusted to meet budget requirements. The new facility is being completed in 2023 in alignment with Ministry Regulations. With the rollout of three-stream collection on the West Coast in December 2022, organics material is collected on an inactive portion of the landfill to meet resident needs until the new facility can be completed.

Waste Reduction Education Program – As detailed above, a significant outreach and education campaign was undertaken with the assistance of Zinc, Surfrider and WildSafeBC to prepare for rollout of the new 3-stream program. Various methods of engaging residents were used, including social media campaigns, information hand-outs for residents and businesses, community events and school education.

Landfill Environmental Monitoring Improvements – Piteau and ACRD field staff continued to work together to sample surface water in various locations around the landfill. At least one sample location was relocated due to safety concerns resulting from fallen trees outside the site but within the neighbouring national park.

Rope and Netting Project – Continuation of a 5-year pilot project with Ocean Legacy to sort and ship out rope and netting for recycling. This project is intended to establish an effective diversion system for these materials that can be used as a template for other coastal landfills in BC. **45.63 tonnes** of Rope & Netting and 16.64 tonnes of Ocean Plastics have been collected by Ocean Legacy and utilized as plastic feedstock for manufacturing signboards.

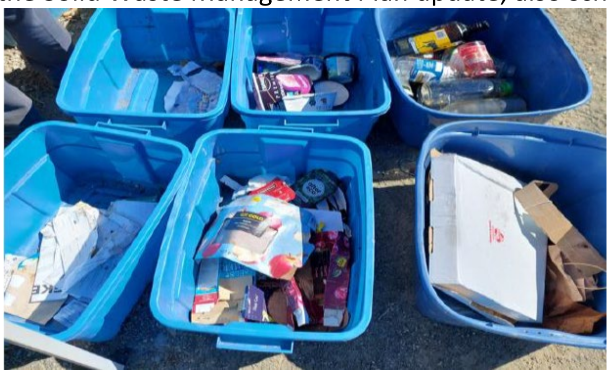
Projects Upcoming

LF Upgrades/Organics Composting Facility (2023) – With facility upgrades wrapping up in Spring 2023, staff will be working with the landfill operator to transfer operations from the old tipping wall to the new transfer station area. Additionally, commissioning and testing of the new organics facility will take place early in 2023. Significant effort is being undertaken to finalize the operations manual for the new facility and satisfy regulatory requirements. A phased approach to receiving and processing organics will include residential curbside sources (completed), followed by commercial sources later in the summer.

Waste Reduction Education Program (2023) – A 3rd party will be contracted to provide waste education outreach with focus on the West Coast, the new 3-stream program, and waste diversion. Additionally, Staff and the new waste education contractor will be working with the Surfrider Foundation to continue to provide waste reduction education through social media campaigns, information hand-outs for residents and businesses, community events and school education. The program will also include conducting commercial waste audits at resorts and other businesses to assist in increasing the diversion of recyclable materials and organics.

Update of Solid Waste Management Plan (2023)- The current Solid Waste Management Plan is 13 years old. In British Columbia, Regional Districts are mandated by the Provincial Environmental Management Act to develop Solid Waste Management Plans that are long term visions of how each regional district would like to manage their solid waste, including waste diversion and disposal activities. A broad engagement plan will be rolled out in both waste sheds as a component of the Solid Waste Management Plan development.

Waste Composition Study (2023) - A study will be commissioned this year to gain an understanding of the quantity of organics, recyclables and Extended Producer Responsibility (EPR) materials in the garbage streams for curbside residential, self-haul and commercial waste. It is expected that the recent diversion of organics, upgrades at the landfill and onboarding of 3-stream collection will inform the next targets for waste reduction and diversion. Critical information from the study will be incorporated into the Solid Waste Management Plan update, also scheduled for 2023.



Tipping Fee Review (2023) – An in-depth review of tipping fees will be conducted to update self-haul rates, minimum fees, and assess cost coverage for diversion programs. The result of this review will be an updated bylaw to encourage and achieve the target of 50% waste diversion.

Landfill Gas Supplementary Report (2023)– Per the earlier section under landfill gas management, the regulation requires an updated assessment every 5 years. An update will be conducted this year.

Explore Temporary Cover Options (2023/2024) – Options and costs for temporary cover will be assessed in cooperation with Berry and Vale and in alignment with the 2024 Design Operation and Closure Plan Update. The goal of temporary cover would be to decrease leachate generation from portions of the site that will not be disturbed for several years. This work should be aligned with the plans for landfill development and progressive closure.

Landfill Contract Extension & Renewal (2023/2024) – The operating contract for Berry and Vale was originally slated to end on June 30, 2023. However, this took into consideration scheduled commissioning of the composting facility in Fall of 2022, to be followed by a 6-month initial operating period to assess the new scope of operations of the landfill site. After that period of time, a contract for the operation of landfill and compost facility would have been issued for competitive bid. Due to these delays, the contract has been extended for one additional year and will be retendered after costs of composting operations have been fully realized. This information will inform the scope of work for the new 2024 landfill operations contract and also be reflected in the 2024 financial plan.

Installation of Flow Monitoring (2023/2024)– As reference in the Environmental Monitoring section, until future upgrade of the leachate treatment facility can be completed, staff are working with ACRD's environmental consultant to determine the best interim method of monitoring flow of the leachate discharge.

Organics Ban (2023/2024) – With the rollout and initial operations for organics diversion being completed in spring 2023, staff will follow-up thorough engage with commercial haulers, organics processors and area residents in order to move towards banning organics from landfilling. With that goal in mind, commercial organics processing will be phased in, followed by an amendment to the Tipping Fee & Regulation Bylaw, tentatively planned for the beginning of 2024.

Construction and Demolition waste diversion (2023/2024) - As part of the Solid Waste Management Plan Update, there will be engagement with generators of this material to investigate options to divert as it makes up 30% of the waste stream on the West Coast.

Design Operation and Closure Plan Update (2024) – The current DOCP was created in 2012 and requires updating to address the leachate system operation, cover usage concerns and generally provide enhanced direction for the development of the landfill. The Province has created new landfill criteria and there are several areas identified that need to be improved to meet the new criteria. An important part of the new DOCP will look at runoff diversion with the completion of each stage of final cover as well as the addition of contact water from the Organics facility. The Water Balance Report estimates that the impact of precipitation on leachate generation will be significantly reduced when portions of the landfill are capped. The DOCP is scheduled for updating once the organics program has been completed, ideally in 2023-2024. This allows time to establish good baseline data for tonnage of organics received along with accurate costing of operating the organics program.

Leachate Treatment Facility (2025/2026)– 2023/2024 is dedicated to additional baseline sampling to inform potential design of a new enhanced facility, which will add treatment capacity for offsite discharge. This information will be incorporated into the conceptual design which is on file and be used to compile the detailed design of the leachate treatment facility in 2024/2025. This will be followed by tendering and construction over the 2025/2026 season.