To: Liquid Waste Committee

From: Andjela Knezevic-Stevanovic, Director, Environmental Management & Quality Control, Liquid Waste Services

Date: July 17, 2023 Meeting Date: September 13, 2023

Subject: **2022 GVS&DD Environmental Management & Quality Control Annual Report**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated July 17, 2023, titled "2022 GVS&DD Environmental Management & Quality Control Annual Report".

EXECUTIVE SUMMARY

Annual reporting of GVS&DD Environmental Management & Quality Control is a regulatory requirement under the *Integrated Liquid Waste and Resource Management Plan*. This report summarizes the performance, process control and regional environmental quality information gathered through various monitoring programs and other environmental management initiatives. In 2022, Metro Vancouver wastewater treatment plants met performance expectations with respect to reduction of contaminant loadings to the receiving environment. Regional liquid waste discharges were effectively managed in a manner that is protective of human health and aquatic life.

PURPOSE

To provide the Liquid Waste Committee with a summary of the 2022 GVS&DD Environmental Management & Quality Control Annual Report.

BACKGROUND

Annual reporting of GVS&DD Environmental Management & Quality Control (EMQC) is a regulatory requirement under the *Integrated Liquid Waste and Resource Management Plan* (ILWRMP). The Executive Summary of the 2022 GVS&DD EMQC Annual Report (Attachment) summarizes the regulatory and operational information gathered through the various monitoring programs and other environmental management initiatives that are in place to meet GVS&DD's commitments under the ILWRMP. They include operation of the liquid waste collection system; wastewater treatment plant influent, effluent and process streams; effluent toxicity; biosolids quality; and environmental heath of regional water bodies. The 2022 GVS&DD EMQC Annual Report will be submitted to the Ministry of Environment and Climate Change Strategy. Additionally, it will be made available to the public through Metro Vancouver's website and through the Metro Vancouver Library.

SUMMARY OF RESULTS

In order to assess wastewater treatment system efficiency, performance and reliability, and to perform biosolids and environmental quality monitoring, the EMQC Division laboratories alone performed about 211,000 analyses in 2022. Major conclusions are outlined below.

The five wastewater treatment plants (WWTPs) treated over 435 billion litres of wastewater in 2022. The treatment process removed over 61,500 tonnes of biochemical oxygen demand (BOD5) and about 61,000 tonnes of total suspended solids (TSS).

About 14,900 tests were performed on biosolids in 2022. Metal concentrations in weekly composite samples and fecal coliform counts in biosolids were generally well below the regulatory limits outlined in the Organic Matter Recycling Regulation.

Effluent samples from all WWTPs passed the required monthly acute toxicity test except for one Lulu Island sample, two Iona Island samples and three Lions Gate WWTP samples. The Iona Island and the Lions Gate effluent samples required oxygen in excess of that specified by the Environment Canada testing method. In the Lulu Island effluent sample, the toxicant could not be determined.

The Iona Island WWTP Deep Sea Outfall monitoring program included sediment and water quality monitoring. The assessment of the 2021 monitoring results completed in 2022 indicate that the applicable objectives or guidelines for water were met, except for dissolved oxygen, boron and permethrin which is consistent with results from previous years. The concentration of substances measured in the sediments were below concentrations that would likely affect aquatic life with the exception total PBDEs (polybrominated diphenyl ethers).

In 2022, Burrard Inlet Environment Monitoring program included both water and sediment quality monitoring. The results of the 2021 Sediment Effects Survey compiled in 2022 were similar to prior years. There was no correlation between wastewater quality indicators and biota results, suggesting that both nutrient and contaminant distributions in Burrard Inlet are confounded by activities and sources other than the Lions Gate WWTP.

In 2022, water quality monitoring in the Fraser River was performed in the vicinity of the Annacis Island WWTP outfall. The report is under preparation.

The bacteriological water quality for primary-contact recreation was met at bathing beaches from May through September, except for five beach locations. Swimming advisories were issued by the Health Authorities for Locarno Beach, Deep Cove, Sunset Beach, Wreck Beach Trail 7 – Oasis and English Bay.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
Ongoing environmental management, monitoring and quality control works are proceeding as required under the ILWRMP and the associated costs are included in the Liquid Waste Services EMQC annual operating budget.

CONCLUSION
Annual reporting of GVS&DD Environmental Management & Quality Control is a regulatory requirement under the *Integrated Liquid Waste and Resource Management Plan*. This report

summarizes the performance, process control and regional environmental quality information gathered through various monitoring programs and other environmental management initiatives that are in place to meet GVS&DD's commitments under the ILWRMP.

As illustrated by the 2022 GVS&DD Environmental Management & Quality Control Annual Report, Metro Vancouver's wastewater treatment plants continue to meet performance expectations with respect to reduction of contaminant loadings to the receiving environment and are consistently providing ongoing benefits to the region. Numerous monitoring programs continue to fulfill their role of confirming that the wastewater treatment plants are operating efficiently and with no adverse effects on human health or the environment. Findings of various environmental management initiatives confirm that regional liquid waste discharges continue to be effectively managed in a manner that is protective of aquatic life.

ATTACHMENTS

1. 2022 GVS&DD EM&QC Annual Report Executive Summary
2. 2022 GVS&DD Environmental Management & Quality Control Annual Report Presentation

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ATTACHMENT 1

EXECUTIVE SUMMARY

INTRODUCTION

Background and Purpose

The Greater Vancouver Sewerage and Drainage District (GVS&DD, or the District) operates five wastewater treatment plants (WWTPs) in the region. Three of the five plants provide secondary treatment (Annacis Island, Lulu Island and Northwest Langley) and discharge treated effluent into the lower Fraser River. The other two WWTPs (Iona Island and Lions Gate) provide primary and chemically enhanced primary treatment and discharge treated effluent to Strait of Georgia and First Narrows of Burrard Inlet, respectively.

The purpose of this report is to document the performance of the collection system and WWTPs in 2022 and to summarize the findings of numerous environmental management initiatives.

This report provides an overview of the information collected as a result of Environmental Management & Quality Control's environmental monitoring, modeling and assessment programs, including monitoring of the collection system, WWTP influent, effluent and biosolids quality, and environmental health of regional water bodies. Other programs and projects discussed in this report are in support of ongoing commitments under the Integrated Liquid Waste and Resource Management Plan (ILWRMP, or the Plan) or compliance with federal or provincial regulatory requirements.

Overview of the Liquid Waste Management Regulatory Framework and Monitoring Process

Under the provisions of the Environmental Management Act, the BC Minister of Environment and Climate Change Strategy approved Metro Vancouver's ILWRMP in May 2011. The Plan has three goals: protect public health and the environment; use liquid waste as a resource; and effective, affordable and collaborative management. Metro Vancouver manages its liquid waste in accordance with the ILWRMP and WWTP-specific Operational Certificates (OCs). These Certificates outline wastewater treatment and performance criteria and authorize the GVS&DD to discharge treated effluent from its WWTPs to the receiving waters. Treatment residuals are managed in accordance with Organic Matter Recycling Regulations.

The federal Wastewater Systems Effluent Regulations (WSER) under the Fisheries Act came into effect on July 18, 2012. The WSER contains provisions that authorize the deposit of treated wastewater into Canadian waters. GVS&DD is required to comply with WSER and monitor and report effluent quality on a quarterly basis.

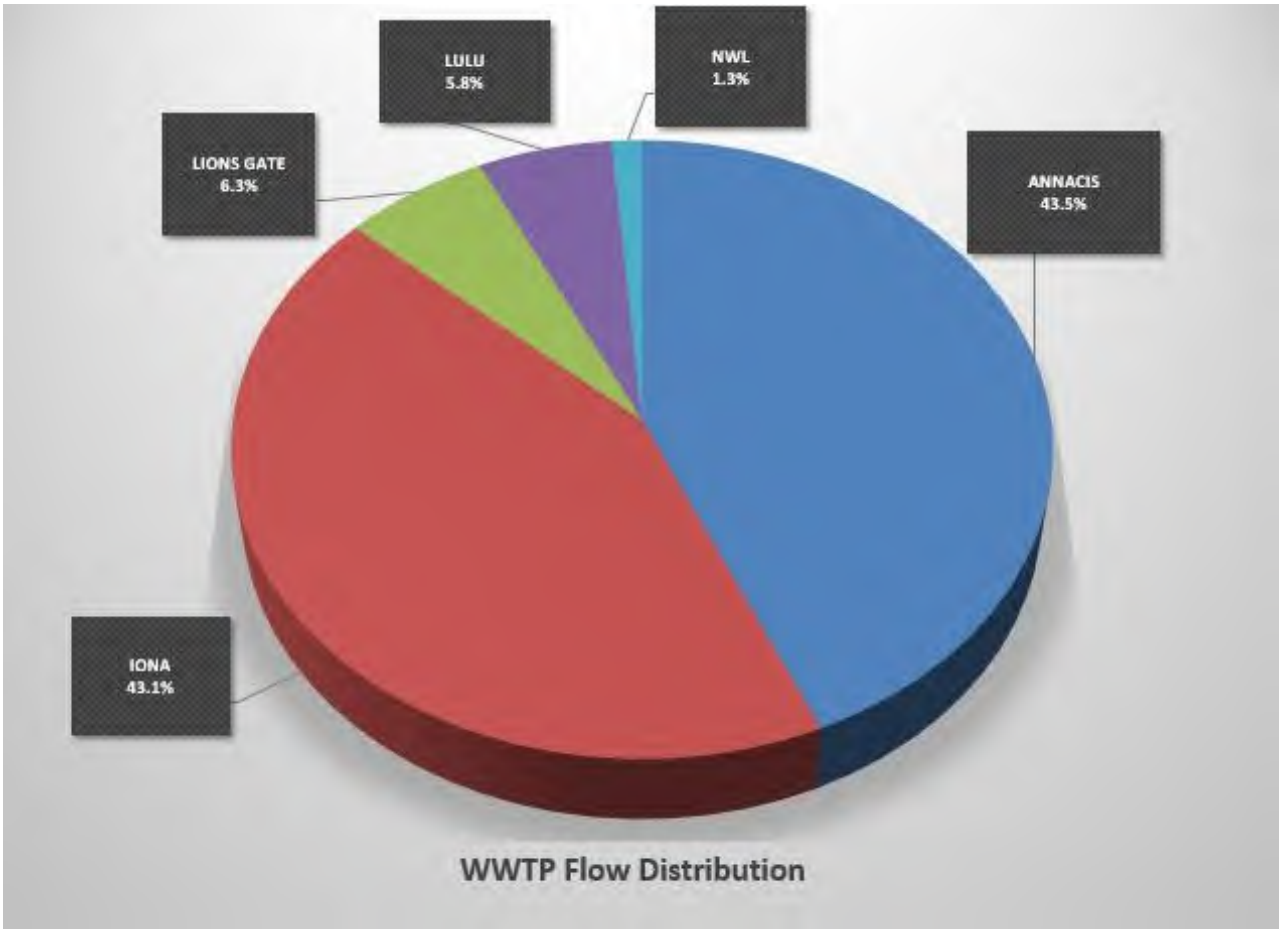
The District's objective is to maintain ongoing compliance with OCs, WSER and other applicable regulatory requirements, and by doing so continue to protect human health and the environment.

Most of the monitoring, laboratory analytical services and data analyses upon which WWTP performance is assessed were provided by the Environmental Management & Quality Control Division of Metro Vancouver Liquid Waste Services.

WASTEWATER TREATMENT PLANTS PERFORMANCE

In 2022, over 435 billion litres of wastewater was treated at the GVS&DD's five WWTPs. Of this total, 215 billion litres received primary or enhanced primary treatment at Iona Island and Lions Gate WWTPs, with the remaining 220 billion litres treated at the three secondary WWTPs at Annacis Island, Lulu Island and Northwest Langley, as shown in the graph below.

Distribution of Wastewater Treated in Metro Vancouver in 2022



Treatment Plant Performance Review

Metro Vancouver treatment plant performance is assessed annually to ensure:

- Plant operation is in accordance with design objectives and specifications; and
- All applicable regulatory reporting requirements are met.

During 2022, the overall performance of the District's five WWTPs exceeded design performance expectations. Individual treated effluent flows for each WWTP and quantities of Biochemical Oxygen Demand (BOD_5) and total suspended solids (TSS) removed in 2022 are summarized in the table below.

Individual treated effluent flows for each WWTP and quantities of BOD_5 and TSS removed in 2022

Total for 2022	Annacis Island WWTP	Iona Island WWTP	Lions Gate WWTP	Lulu Island WWTP	Northwest Langley WWTP	Total
Effluent Flow, ML	189,141	187,685	27,447	25,177	5,728	435,177
BOD_5, Tonnes Removed	37,769	12,768	2,112	7,204	1,740	61,593
TSS, Tonnes Removed	32,901	17,010	4,098	5,432	1,559	60,999

Wastewater Treatment Plant Operational Certificates

The OCs issued by the Ministry of Environment and Climate Change Strategy (MOECCS) under the provisions of the Environmental Management Act include daily compliance levels for flow and daily loadings for BOD_5 (or Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), where applicable) and Total Suspended Solids (TSS). The loading parameters listed as "maximum daily discharge loadings" are used to calculate the annual discharge authorization fees as required by the Permit Fees Regulation and are based on a calendar year. Note that the maximum daily discharge loadings for BOD_5 or $CBOD_5$ and TSS were removed from each WWTP's OC in early 2022 after an amendment by MOECCS. The amendment was initiated to align the OC annual fees to the Permit and Approval Fees and Charges Regulation.

Among other OC conditions, requirements are listed for disinfection of the effluent at all WWTPs except Iona Island, so that fecal coliform water quality objectives for the receiving water body are met at the edge of the Initial Dilution Zone (IDZ) as defined by the Municipal Wastewater Regulation. When chlorine is used for disinfection, it must be removed from the effluent before discharge to the receiving waters.

The OC requirements for BOD_5 and TSS were met throughout 2022. OCs require Metro Vancouver to report all treatment process interruptions to the MOECCS, and in 2022, GVS&DD submitted 11 such reports. Reported events can be generally grouped into 2 categories: Category 1 includes instances of disinfection or dechlorination system interruptions, plant bypasses and other unauthorized discharges. Category 2 events were the results of daily discharge loadings for TSS or $CBOD_5$ above the maximum load limits, as well as a daily rate of effluent discharge above the maximum limits. These events typically have no significant environmental impact.

Each event is carefully reviewed and a probable cause, mitigation measures and potential environmental effects are assessed based on dilution dispersion modeling of effluent plume transport and predicted downstream concentrations, or on field observations.

Integrated Liquid Waste and Resource Management Plan (ILWRMP)

The ILWRMP commits GVS&DD to operate the secondary WWTPs to meet the National Performance Standards for effluent specified by the Canada-wide Strategy for the Management of Municipal Wastewater Effluent (CWS-MMWE). These National Performance Standards for effluent quality are also included into the Wastewater Systems Effluent Regulation. The concentrations of $CBOD_5$ and TSS at all secondary WWTPs stayed below the maximum average of ≤ 25 mg/L as specified by the National Performance Standards. Averaging periods for Annacis Island and Lulu Island WWTP are monthly, and for Northwest Langley WWTP, quarterly.

Wastewater Systems Effluent Regulations (WSER)

Quarterly monitoring reports were submitted through Environment and Climate Change Canada's (ECCC's) Effluent Regulatory Reporting Information System (ERRIS) in 2022. As required by WSER, the effluent monitoring data reported were: number of days that effluent was deposited; total volume of effluent deposited in m^3; average effluent $CBOD_5$ in mg/L; and the average effluent concentration of suspended solids in mg/L. Reporting of effluent acute lethality for secondary treatment plants is required on a quarterly basis[1] for Annacis Island and Lulu Island WWTPs, and on an annual basis for the Northwest Langley WWTP.

In 2022, all District's secondary WWTPs met the applicable WSER requirements for all regulated parameters: TSS, $CBOD_5$, un-ionized ammonia and total residual chlorine. Non-acute lethality of effluent requirement was consistently met by the Annacis Island and Northwest Langley WWTPs but not throughout the entire year at the Lulu Island WWTP.

GVS&DD's primary treatment plants (Iona Island and Lions Gate WWTPs) were issued Transitional Authorizations (TA) under WSER on September 5, 2014. In 2022, the Iona Island WWTP met the applicable WSER requirements for regulated parameters: TSS, $CBOD_5$ and un-ionized ammonia.

The Lions Gate TA expired on December 30, 2020. The monthly average limits of 115 mg/L $CBOD_5$ and 76 mg/L TSS specified in the TA for this WWTP were only applicable up to the end of 2020. Starting January 2021, the applicable monthly average limits defined in WSER are 25 mg/L $CBOD_5$ and 25 mg/L TSS. Due to a delay constructing the North Shore WWTP, the Lions Gate WWTP was not able to meet the $CBOD_5$ and TSS limits in 2022, although it met the limits for total residual chlorine and un-ionized ammonia. Non-acute lethality of effluent requirement was not consistently met throughout the entire year at the Lions Gate WWTP.

[1] Due to toxicity testing results in 2021, frequency was increased to monthly at the Annacis Island and Lulu Island WWTPs in 2022.

Effluent Toxicity Monitoring

In 2022, all effluent samples from all WWTPs passed the OC required Rainbow Trout acute lethality test using ECCC test protocols with the following exceptions: one Lulu Island WWTP sample, two Iona Island WWTP samples, and three Lions Gate WWTP samples. The subject Iona Island and the Lions Gate effluent samples required oxygen in excess of that specified by the ECCC method. In the Lulu Island effluent sample, the toxicant was undetermined.

In addition, acute toxicity testing of *Daphnia magna* was conducted monthly (or quarterly[2] for Northwest Langley WWTP) as recommended by the CWS-MMWE. Samples from all the WWTPs passed the *Daphnia magna* acute toxicity test, with the exception of two Iona Island and two Lions Gate WWTP samples which were determined to be due to a higher oxygen demand.

The 2022 chronic toxicity testing was conducted using two freshwater and four marine tests. While some toxicity was observed, chronic toxicity was not predicted to occur at the initial dilution zone (IDZ) boundary except for the water flea, *Ceriodaphnia dubia*, in two Lulu Island and one Annacis Island WWTP effluent samples tested. For all other WWTP effluent samples and test species, chronic toxicity at the IDZ boundary was not predicted to occur.

Biosolids Monitoring Program

Process Requirements and Biosolids Management

The Organic Matter Recycling Regulation (OMRR) governs the management of biosolids and compost as soil amendments in the Province of British Columbia. Under this regulation, sampling frequencies and criteria values for fecal coliforms and metals as specified for Class A and Class B biosolids are based on several parameters including: type of treatment process (pathogen reduction requirements, vector attraction reduction); the amount of dry solids produced on a monthly basis; and the intended use of the biosolids. The GVS&DD's biosolids management program ensures that any biosolids not meeting class specifications are identified, tracked and managed appropriately.

Biosolids Quality

About 14,900 tests were performed on biosolids in 2022. Metal and fecal coliform counts in biosolids were generally well within the Class A criteria for Annacis Island WWTP, and within Class B criteria for Lions Gate and Lulu Island WWTPs. Iona Island WWTP land-dried biosolids met the Class B criteria. Thickened waste secondary sludge from Northwest Langley WWTP was trucked to Annacis Island WWTP for digestion.

[2] Due to laboratory constraints, only three Northwest Langley and 11 Iona WWTP samples were tested with the *Daphnia magna* test in 2022.

ENVIRONMENTAL MANAGEMENT PROGRAMS

Environmental management programs form a major part of the Metro Vancouver's integrated approach to managing liquid waste. The purpose of these programs is to characterize environmental conditions of relevant water bodies in the region in order to understand the relative contribution and significance of discharges from the regional and municipal systems, determine if the applicable regulatory requirements are being met, and to warn of possible environmental issues. Environmental management programs include environmental monitoring, human health and ecological risk assessments, and environmental simulation and forecasting.

Overflow Quality Monitoring and Environmental Risk Assessments

Municipal wastewater in the region is conveyed and treated in the District's WWTPs. However, discharges of untreated wastewater into regional water bodies are sometimes unavoidable mostly due to insufficient system capacity during wet weather, power outages, and the legacy of combined sewer systems.

Combined Sewer Overflows

In 2022, the Combined Sewer Overflow (CSO) Monitoring Program characterized the overflow water quality at three selected CSO locations: Chilco-Brockton, MacDonald and Westridge.

Sanitary Sewer Overflows

Metro Vancouver continued monitoring the receiving environment water quality after each sanitary sewer overflow and provided results to regulatory agencies and municipalities.

Environmental Monitoring in the Regional Waterbodies

Metro Vancouver monitors environmental health of the regional water bodies:

- near WWTP outfalls in the receiving environment, at the IDZ boundary, and
- in major water bodies within the ambient environment further away from WWTPs and other point source discharges to assess background conditions and help interpret other monitoring results.

In previous annual reports, Metro Vancouver reported separately on WWTP receiving environment monitoring (REM) and ambient environment monitoring (AEM) programs. Metro Vancouver has modified its programs to a more holistic water body approach and in 2022 continued with amalgamated receiving and ambient environment monitoring programs for Burrard Inlet water and sediment quality, and for Fraser River water quality. A summary of the monitoring program findings for the regional water bodies is provided below.

Strait of Georgia

In 2022, a multi-year collaboration with UBC continued, and findings of the 2021 field work were reviewed and compiled into the report. The 2021 Iona Island WWTP Deep Sea Outfall monitoring program included sediment and IDZ boundary monitoring. The assessment of

the monitoring results indicated that the applicable objectives or guidelines were met at the IDZ boundary, except for dissolved oxygen, boron and permethrin, which is consistent with previous years. The concentration of substances measured in the sediments were below concentrations that would likely affect aquatic life with the exception total polybrominated diphenyl ethers (PBDEs). Short-term and long-term exposure tests indicated that all of the sediment samples collected were non-toxic to marine worms (Neanthes arenaceodentata) and mussels (Mytilus galloprovincialis).

Burrard Inlet

In 2022, Burrard Inlet Environment Monitoring program included both water and sediment quality monitoring. The results of the 2021 Sediment Effects Survey, compiled in 2022, were similar to prior years. The Lions Gate WWTP discharges appear to have contributed to conditions more favourable for infaunal recruitment, growth, and reproduction. However, there was no correlation between wastewater quality indicators and biota results, suggesting that both nutrient and contaminant distributions in Burrard Inlet are confounded by activities and sources other than the Lions Gate WWTP.

Fraser River

As Metro Vancouver is transitioning to a more holistic integrated approach to its monitoring programs, what formerly were two separate monitoring programs, the Fraser River WWTP Receiving Environment Monitoring Program (REM) (referred to as Annacis IDZ) and the Fraser River Ambient Monitoring Program (FRAMP), were operated in 2022 as a single program under the name of Fraser River Environmental Monitoring Program (FREMP). In 2022, the field work was completed for the 2022 Fraser River water quality monitoring.

Recreational Water Quality Monitoring Program

Metro Vancouver monitored the bacteriological quality of recreational waters in the region at 114 sampling sites from 41 locations. In 2022, the bacteriological water quality for primary-contact recreation was met for most bathing beaches from May through September. Swimming advisories were issued by the Health Authorities as a result of *E. coli* concentrations exceeding the single sample maximum guideline consecutively at Locarno Beach (6 days; 5 days), Deep Cove (6 days), and Sunset Beach (4 days); as a result of exceedances of the 30-day geometric mean guideline at Wreck Beach Trail 7 – Oasis (15 days); and both consecutive single sample exceedances (7 days) and geometric mean guideline exceedances (9 days) in the case of English Bay.

To: Liquid Waste Committee

From: Shellee Ritzman, Division Manager, Corporate Communications
Carol Nicolls, Communications Specialist, Corporate Communications

Date: September 6, 2023 Meeting Date: September 13, 2023

Subject: **2023 Unflushables Campaign Results**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated September 6, 2023, titled "2023 Unflushables Campaign Results".

EXECUTIVE SUMMARY

The 2023 Unflushables campaign ran from April 1 to May 28. The campaign aims to reduce the disposal of seven key problem items into the wastewater system. The media strategy targeted adults aged 25 to 54 and included social media, television, radio, Google Search, and placements in elevators and on bus sides. The campaign produced solid results, generating 20 million impressions, 1.6 million video views and 4,957 engagements. De-ragging incidents have generally dropped since 2017, but have increased the last two years, likely due in part to improved measurement. A post-campaign survey showed that most residents are aware of what can't be flushed, though there was a slight increase in willingness to flush campaign items. Metro Vancouver continues to work with the Health Products Stewardship Association to leverage joint opportunities to promote the medications take-back program. The campaign will run again in 2024.

PURPOSE

To update the Committee on the results of the 2023 regional Unflushables campaign.

BACKGROUND

The incorrect disposal of wipes and other items into the sewer system costs the region around $2 million every year. Now in its seventh year, the Unflushables campaign asks residents to correctly dispose of seven items that should not be flushed: wipes, paper towels, floss, hair, condoms, tampons and applicators, and medications. Medications are difficult for wastewater treatment plants to fully remove and can end up in the environment, while the other items contribute to sewer clogs and overflows. Residents were asked to return medications to a pharmacy and put the other items in the garbage.

The campaign supports the source control objectives of the current and future *Integrated Liquid Waste and Resource Management Plan*. This report provides an update on the results of the 2023 campaign as identified in the 2023 Liquid Waste Committee Work Plan.

2023 REGIONAL UNFLUSHABLES CAMPAIGN

The 2022 Unflushables campaign was in market from April 1 to May 28. The campaign largely used existing creative, with some additional images and videos developed for social media and YouTube.

Media Strategy

The media strategy targeted adults 25–54, skewing slightly towards women as the main purchasers of many of the products addressed in the campaign, and putting extra focus on wipes and medications. The media buy leveraged both broad and targeted tactics and included digital (YouTube, Facebook, Instagram, Google Search) and broadcast (geo-targeted television PSA, radio, and out-of-home advertising on bus sides and elevator screens in multi-family buildings). All the placements directed to the campaign website. A new image and video were created to refresh the social media creative options.

Engagement of Metro Vancouver Members

Campaign details and creative materials were shared with members' communication staff prior to the campaign's launch. All materials were made available for download on the Metro Vancouver website, and custom, co-branded materials were created upon request. The media buy included spots in all member jurisdictions, ensuring that the campaign ads appeared across the region.

Results

Overall the campaign performed well, with most areas maintaining solid results that were similar to last year's. Results in some areas were lower in 2023, due to increased costs on some advertising platforms and a smaller media buy budget than in 2022 (part of the 2023 budget was re-allocated to the biannual post-campaign survey).

Media Buy and Website Performance

- The campaign delivered 20 million impressions, though radio, digital and out-of-home placements.
- Broad, traditional tactics delivered over half of impressions, with just under 13 million impressions across advertising on bus sides, radio, and elevator screens.
- Targeted digital tactics delivered over 6 million impressions across social media, YouTube, and Google Search, with a reach of 664,000. Google Search continue to perform well and saw an increase in the number of people clicking through for more information.
- The campaign generated 1.6 million video views via YouTube and social media. YouTube reach was slightly lower than in 2021, but had a stronger frequency, so people saw the ads more often.
- Radio commercials on three stations generated 2 million impressions (456 spots) and were supplemented with social media posts by radio announcers, which generated 1,343 engagements. The television PSA aired 4,162 times.
- Social media placements performed well, reaching over 600,000 people and generating 3,614 engagements (likes, comments, and shares).

Post-campaign Survey

A post-campaign survey of 1,177 residents was conducted between May 30 and June 8. Results showed that:

- The campaign reached reached 20% of residents and most residents surveyed are aware of how to properly dispose of campaign items

- Four-in-ten (41%) residents flush one or more of the campaign items (excluding feminine hygiene products) at least "occasionally", a moderate increase of 4% from 2021, with convenience cited as the main reason for flushing
- The proportion of women who report flushing feminine hygiene items has steadily declined with growing awareness, dropping from 26% in 2017 to 15% in 2023
- Younger residents and men are more likely to think it's acceptable to flush campaign items. Among residents aged 18-34, 30% feel it's acceptable to flush campaign items, compared to 13% of residents 35 and older.
- Among those who saw the campaign advertising, 31% said they talked about it or its messages with others, with men more likely to discuss the ads than (41% men vs 21% women)

Impacts of Wipes and Other Unflushable Items on the Sewer System

Metro Vancouver continues to track the number of pump station clogs that require de-ragging by operations staff. As shown in Table 1, records show that the long-term trend in the number of de-ragging events at Metro Vancouver pump stations has generally been downwards. However, there are fluctuations in the number of events from time to time that cannot be readily explained. A number of factors contribute to clogs, including unflushable items and grease, making it difficult to measure the specific impact of unflushable items on the wastewater system. In recent years, Metro Vancouver has also been improving the process for tracking de-ragging events, which likely also contributes to the reported increases in 2022. The number of clogs should be considered as only one of the indicators used to assess campaign effectiveness.

Table 1. De-ragging Events in Metro Vancouver Pump Stations

Year	Events
2016	53
2017	121
2018	58
2019	34
2020	35
2021	37
2022	106
2023	29 as of June 15; 58 projected to year end

Metro Vancouver staff continue to work with member jurisdictions to track the collective impacts of wipes and other unflushable items, including clogs, damaged equipment, impacts of sewer overflows, and the associated maintenance costs of these impacts. Metro Vancouver is collaborating with the Health Products Stewardship Association to leverage joint messaging opportunities through social media and pharmacy materials as part of the medications return program. As the Canadian Water and Wastewater Association works to implement product labelling standards for flushability, Metro Vancouver staff continue to review opportunities to incorporate aspects of this messaging into campaign messaging over time.

Plans for 2024 Campaign

The campaign will run again in 2024, likely with similar timing. The post-campaign survey highlights the need to reach younger residents (18-35, especially men), who are much more likely to flush campaign items. Reaching this demographic will require some rethinking of the campaign creative and approach, which can happen as part of a larger refresh of the campaign's creative materials and approach.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The 2023 Unflushables campaign had a budget of $110,000, supported under the Liquid Waste Communications Program of the 2023 General Government Budget.

CONCLUSION

The campaign continues to generally perform well, with solid media buy results and post-campaign survey results. The post-campaign survey generally shows increasing awareness and a decreasing likelihood of residents flushing campaign items. It also highlights the need to reach younger residents, particularly men, as this group is much more likely to flush campaign items. For 2024, Metro Vancouver will look at ways to better reach this group, possibly using a different creative direction. It will also look at options to update the creative, which has now been in market for seven years. The campaign will run again in 2023, likely with similar timing.

ATTACHMENTS

1. Sample of Campaign Materials
2. 2023 Unflushables Campaign Results Presentation

REFERENCE

1. Unflushables Campaign Website

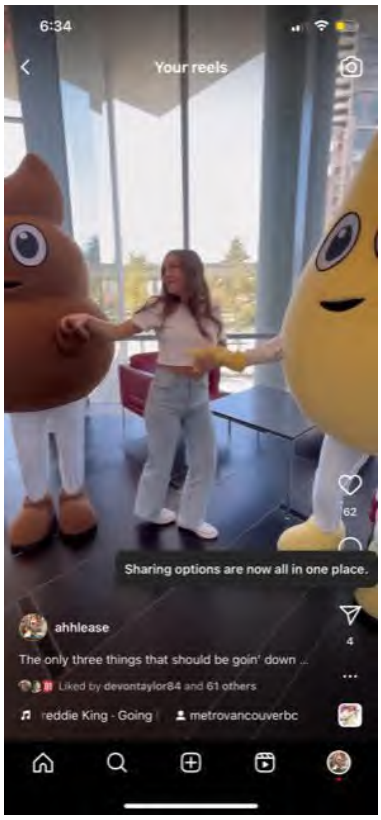
60908692

ATTACHMENT 1

Sample of Campaign Materials

New social media creative

Unflushables bus wrap



Social media posts by radio stations

To: Liquid Waste Committee

From: Colin Meldrum, Director, Engineering, Design & Construction, Liquid Waste Services

Date: August 15, 2023 Meeting Date: September 13, 2023

Subject: **Liquid Waste Services Capital Program Expenditure Update as at June 30, 2023**

RECOMMENDATION

That the Liquid Waste Committee receive for information the report dated August 15, 2023, titled "Liquid Waste Services Capital Program Expenditure Update as at June 30, 2023".

EXECUTIVE SUMMARY

The capital expenditure reporting process as approved by the GVS&DD Board provides for regular status reports on capital expenditures. This is the second report for 2023 which includes the overall capital program for Liquid Waste Services with a multi-year view of capital projects, and the actual capital spending for the 2023 fiscal year to June 30, 2023 in comparison to the annual Capital Cash Flow. As of June 30, 2023, the capital expenditures for Liquid Waste Services are $134.8 million, compared to a prorated annual Capital Cash Flow of $340.9 million. This shortfall is primarily due to invoicing and project delays and the timing of some construction work for the latter portions of the year.

Forecasted expenditures for the current Liquid Waste Services capital program generally remain within the annual Capital Cash Flow planned for 2023.

PURPOSE

To report on the status of the Liquid Waste Services' capital program and financial performance for the 2023 fiscal year to June 30, 2023.

BACKGROUND

The capital expenditure reporting process provides for regular status reports on capital expenditures with interim reports sent to the Water, Liquid Waste and Zero Waste Committees with a final year-end report to the Committees and the Boards in April of each year. Recent changes to the reporting framework now involve four reports per year (one per fiscal quarter) rather than three times per year. This is to align with the Finance Committee reporting schedule.

This report covers GVS&DD capital projects managed by both the Liquid Waste Services and the Project Delivery Departments.

The series of four reports for 2023 look at both the overall capital program for Liquid Waste Services with a multi-year view of capital projects and the actual capital spending for the 2023 fiscal year to date in comparison to the prorated annual Capital Cash Flow.

2023 CAPITAL EXPENDITURES

Capital Program Funding

The capital spending for Liquid Waste Services is funded through the Liquid Waste Operating Budget by a combination of contribution to capital (pay-as-you-go funding) and debt service costs (principal and interest payments) which is generated annually from the regional ratepayers. As a result, the annual impact on the ratepayers is significantly less than the level of budgeted capital expenditures.

Overall Capital Program

The overall capital program for Liquid Waste Services includes capital projects which require multiple years to complete. These projects are broken down into various phases such as project definition, pre-design, detailed design and construction. With the completion of each phase, more information is learned for the appropriate costing of subsequent phases.

It is expected that the capital spending on the Liquid Waste Services capital projects completed in 2023 or ongoing at some point in 2023 will be over the estimated total project cost by approximately $334.0 million, or 1.9% of total estimated cost. These estimated costs are generally being adjusted as part of the 2024 – 2028 Financial Plan and will be further adjusted through the BY2024 capital planning process. For the most part, all of the projects include contingencies in their budgets. Often, these amounts are not fully expended, and will result in projects being completed under budget.

Attachments 1A and 1B provide the details behind the summary information including specific capital projects, summary financial information and notes where required. Attachment 2 provides additional project status information for some of the key projects being completed by the LWS Department. Projects being completed by the Project Delivery Department are excluded from Attachment 2 as they are generally the subject of separate reports.

2023 Capital Program Progress

The Metro Vancouver financial planning process includes Board approval of both an annual Operating Budget (operations, contribution to capital and debt service) and an annual Capital Cash Flow for the planned capital infrastructure projects. The annual Capital Cash Flow comprises the projected spending for a list of capital projects either continuing or to be started within the calendar year.

Table 1 provides a summary of the 2023 actual capital spending to June 30, 2023 compared to the total annual Capital Cash Flow. As of June 30, 2023, capital expenditures for Liquid Waste Services were $134.8 million compared to the annual prorated Capital Cash Flow of $340.9 million. These projects are managed either by the Project Delivery Department or internally by the Liquid Waste Services Department.

Table 1 – June 2023 Capital Spending Summary

Liquid Waste Total	2023 Cash Flow to June 30, 2023	Actual Expenditures to June 30, 2023	% of 2023 Prorated Cash Flow
Collections	$ 101,534,000	$ 50,277,213	50%
Treatment Plants	$ 239,341,000	$ 84,518,501	35%
Total	**$ 340,875,000**	**$ 134,795,714**	**40%**

The underspend is due to four general factors including:

- delays in invoicing for active construction projects, as contractor invoicing is a minimum of 1 month behind progress;
- project delays either in tendering works, initiating construction, or due to design delays; supply chain issues, protracted property negotiations and/or permitting delays; and
- projects which will ramp up construction activities later in the year.

With respect to this last item, Gilbert Road Trunk Sewer South and Central Sections, the South Surrey Interceptor Johnston Road Section, Gleneagles Pump Stations 4 and 5 and the North Road Trunk Sewer have all been awarded construction contracts, but have had limited expenditures in the first six months of the year. Gilbert Road Trunk Sewer Central Section broke ground in May, while Gleneagles Pump Stations and North Road Trunk Sewer were given Notice to Proceed in June. The Annacis Island Wastewater Treatment Plant Influent Surge Control Refurbishment Project started active construction in May. All of these will have greater expenditures in the second half of the year than in the first half. Additional details on these and other significant projects are included in Attachment 1A.

With respect to projects being delivered by the Project Delivery Department, for the most part they are subject to separate standalone reports. The issues on the North Shore Wastewater Treatment Plant Project have resulted in delays to the projected cash flow as have the archaeology issues on the Northwest Langley Wastewater Treatment Plant.

Ongoing Capital Program Impacts from COVID-19 and Current Economic Climate

During these unprecedented times of health and economic uncertainty, all departments have been monitoring the impacts of the pandemic, inflation and supply chains on their operations. This includes capital program expenditures.

Direct impacts due to the pandemic appear to have disappeared. Ongoing supply chain issues continue to affect the schedule of projects as certain components are having longer delivery times than anticipated. Staff are looking at measures to reduce these risks. The inflationary environment is also requiring staff to review project budgets and update estimates, and staff are monitoring impacts on their projects regularly.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Capital expenditures are funded internally (pay as you go) and through debt service costs (interest and principal payments). As capital expenditures are incurred, short term financing is secured and converted twice per year to long term debt through the Municipal Finance Authority.

CONCLUSION

Although the 2023 Liquid Waste Services capital expenditures are less than the planned amounts, the variance is generally a result of cash flow timing, with a number of projects having expenditures deferred to future years. Any surplus resulting from a 2023 underspend will be used to directly fund capital in 2024 and avoid future borrowing.

Attachments

1A. Capital Project Update – Liquid Waste Services
1B. Capital Project Update – Liquid Waste – Project Delivery
2. Liquid Waste Services Capital Project Status Information

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ATTACHMENT 1A

Metro Vancouver
Liquid Waste Services - Capital Project Update
As of June 30, 2023

Project Name	Primary Driver	Project Location	Years	Approved Capital Budget	Current Estimated Total Project Cost	% Complete	Comment
			2023-2027 Capital Plan 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032				
Collections							
8th Avenue Interceptor Air Treatment Facilities	Upgrade	Vancouver		500,000	14,200,000	3%	Project deferred to address property and siting
Albert Street Trunk Sewer	Growth	Port Moody		10,250,000	10,250,000	98%	substantially complete
Big Bend Forcemain - Gate Replacement	Maintenance	Richmond		200,000	2,700,000	3%	project deferred
Burnaby Lake North Interceptor Cariboo Section	Growth	Burnaby		-	41,000,000	0%	Future project
Burnaby Lake North Interceptor Winston Section	Growth	Burnaby		116,950,000	116,950,000	35%	The project experienced a 4 month delay due to ground conditions, but is progressing.
Burnaby South Slope Interceptor	Growth	Burnaby		500,000	22,700,000	0%	project deferred
Cloverdale Pump Station Capacity Upgrade	Growth	Surrey		3,400,000	103,400,000	1%	Estimates shown is for a new pump station and a
Cloverdale Trunk Sewer Capacity Upgrade	Growth	Surrey		1,200,000	29,000,000	1%	
Combined Sewer Overflow Sampling Station Enhancements	Maintenance	Regional		1,900,000	1,900,000	59%	
Crescent Beach FM - Replacement	Maintenance	Surrey		26,850,000	47,100,000	84%	Project delayed. Budget issues due to unforseen ground conditions and archaeology issues.
Eagle Creek (Lower Section) Channel Restoration	Resilience	Burnaby		-	750,000	0%	no change, future project.
EMQC-Chemistry Laboratory	Upgrade	Delta		250,000	8,650,000	0%	
Lozells Sanitary Trunk Golf Course Section	Growth	Burnaby		-	27,650,000	0%	future project
Manitoba Street Combined Trunk Sewer Separation	Upgrade	Vancouver		-	93,750,000	0%	Future project
Production Way Operation Center Design and Construction	Upgrade	Burnaby		31,000,000	40,400,000	1%	
Fraser Sewerage Area Integrated Resource Recovery (IRR) Study	Opportunity	Regional		1,200,000	1,200,000	14%	
Front Street Pressure Sewer Access Hatches Reinforcement	Maintenance	New Westminster		5,000,000	5,000,000	40%	construction being deferred to 2024 due to third party (MOTI) activities
FSA Flow Metering Program	Maintenance	Regional		2,500,000	3,500,000	54%	
FSA River Crossing Scour Protection Program - Phase 1	Maintenance	Regional		4,200,000	6,400,000	50%	
FSA Sewer Relocations and Protections	Maintenance	Regional		11,700,000	11,700,000	0%	multiple projects inc. Patullo Bridge, CPR, Fraser Surrey Docks. Timing and amount of some project costs dependent on third parties
FSA Statutory Right of Way Acquisitions Phase 1	Maintenance	Delta/Port Moody		35,100,000	35,100,000	31%	ongoing program, funds used as required for OSRW purchases.
Gilbert/Brighouse Trunk Pressure Sewer	Maintenance	Richmond		169,650,000	198,400,000	50%	
Glen Eagles Forcemain Replacement	Maintenance	WestVancouver		15,850,000	15,850,000	35%	Phase 1 completed several years ago. Phase 2 work is designed but awaiting a permit from CN Rail.
Gleneagles Pump Stations Improvements	Maintenance	WestVancouver		33,300,000	40,850,000	8%	Construction beginning on two of five sites in July 2023.
Glenbrook Combined Trunk Kingsway Sanitary Section	Growth	Burnaby		7,200,000	8,100,000	11%	Construction deferred to 2024 to address City of Burnaby concerns.
Glenbrook CSO Gate Replacement	Maintenance	New Westminster		5,150,000	5,150,000	50%	Construction tendered, but may be delayed to 2024 due to supply chain issues
Harbour Pump Station Discharge Header Repair and Valve Replacements	Maintenance	Vancouver		2,500,000	4,850,000	40%	
Harbour Pump Station Power Distribution Equipment Replacement	Maintenance	Vancouver		1,600,000	3,650,000	14%	
Hastings-Cassiar Intake Connection	Growth	Vancouver		5,350,000	5,350,000	98%	Project substantially complete
Highbury Interceptor Diversion Junction Chamber Wall Rehabilitation	Maintenance	Vancouver		500,000	6,000,000	0%	
Highbury Interceptor North Arm Crossing - Upgrade of Siphons	Resilience	Vancouver		12,500,000	12,500,000	99%	Project substantially complete

Metro Vancouver
Liquid Waste Services - Capital Project Update
As of June 30, 2023

Project Name	Primary Driver	Project Location	Years	Approved Capital Budget	Current Estimated Total Project Cost	% Complete	Comment
			2023-2027 Capital Plan				
			2023 2024 2025 2026 2027 2028 2029 2030 2031 2032				
Jervis Pump Station 25kV Voltage Conversion	Maintenance	Vancouver		1,300,000	1,300,000	19%	Project delayed due to supply chain issues
Kent Pump Station High Voltage Switchgear Replacement	Maintenance	Vancouver		1,150,000	3,000,000	11%	
Surrey Central Valley Capacity Upgrade	Growth	Surrey		-	60,800,000	0%	future project
Production Way Facility Access and Parking Improvements	Maintenance	Burnaby		4,850,000	4,850,000	5%	
LSA Flow Metering Program	Maintenance	Richmond		300,000	300,000	25%	
Marshend Pump Station	Growth	Burnaby		10,500,000	21,150,000	9%	Project delayed to properly define scope.
New CSO Management Gates for New Westminster Interceptor	Upgrade	New Westminster		3,250,000	400,000	11%	Project will be cancelled as costs outweigh benefits
New West Interceptor - Annacis Section 2	Maintenance	Delta		42,000,000	42,000,000	17%	
New West Interceptor Grit Chamber	Maintenance	New Westminster		1,250,000	9,300,000	2%	
New Westminster Interceptor Repair Columbia St. Section	Maintenance	New Westminster		39,550,000	39,850,000	70%	Main contract is substantially complete. Additional work to be undertaken after Pattulo Bridge completion.
New Westminster Interceptor West Branch and Columbia Extension Rehabilitation	Maintenance	New Westminster		2,900,000	37,900,000	5%	
North Road Trunk Sewer	Growth	Coquitlam		11,700,000	13,600,000	59%	majority of Phase 1 done. Remainder delayed due to dispute with BNSF
North Road Trunk Sewer Phase 2	Growth	Coquitlam		8,450,000	10,000,000	14%	Phase 2 contract awarded, with construction to start in summer 2023
North Surrey Interceptor - Port Mann Section - Odour Control	Upgrade	Surrey		5,050,000	29,600,000	1%	Conceptual design nearing completion
North Surrey Interceptor Annieville Channel Crossing Scour Protection	Maintenance	Regional		4,350,000	4,350,000	49%	
North Surrey Interceptor Improvements	Maintenance	Surrey		3,000,000	6,000,000	0%	
North Surrey Interceptor Roebuck Section Replacement	Maintenance	Surrey		1,600,000	19,450,000	1%	
NSA Flow Metering Program	Maintenance	West Vancouver		500,000	900,000	36%	
NSA Scour Protection Upgrades	Maintenance	Regional		2,250,000	2,250,000	5%	construction rescheduled to 2024 to address concerns from local First Nations
NSI 104th Ave Extension	Growth	Surrey		12,950,000	12,950,000	38%	project on hold to address scoping
NSI Flow Management	Upgrade	Surrey		11,500,000	94,500,000	10%	
NSI Rehab or Replacement	Maintenance	Surrey		16,450,000	50,400,000	14%	
Ocean Park Trunk Manholes Lining	Maintenance	Surrey		-	1,050,000	0%	future project
Ocean Park Trunk Sewer - Air Management Facility	Upgrade	Surrey		2,750,000	7,750,000	21%	Property acquired. Preliminary engineering starting.
Port Coquitlam Pump Station Refurbishment	Maintenance	Port Coquitlam		5,950,000	75,600,000	1%	Feasibility Study completed, Preliminary Design not
Port Moody Pump Station Capacity Upgrade	Growth	Port Moody		2,300,000	23,850,000	3%	A conceptual design phase to investigate upgrade options is being completed. Current estimate is for upgrading the existing station.
Port Moody South Interceptor Capacity Upgrade	Growth	Port Moody		-	3,450,000	0%	future project
Port Moody Storm Drain Rehabilitation	Maintenance	Port Moody		200,000	1,600,000	0%	
Rosemary Heights Pressure Sewer Capacity Upgrade	Growth	Surrey		-	10,750,000	0%	future project
Royal Ave PS Rehabilitation	Maintenance	New Westminster		10,100,000	12,900,000	18%	99% design completed, Construction not yet started.
Sapperton Pump Station	Growth	New Westminster		97,500,000	97,500,000	92%	New Sapperton PS was substantially complete July 2021. Demolition of old Sapperton PS pending completion of other work on site and adjacent projects.
Sapperton Pump Station Emergency Backup Power	Resilience	New Westminster		5,000,000	5,000,000	3%	
Sewer Heat Projects	Opportunity	Regional		21,400,000	71,500,000	0%	
South Surrey Interceptor Johnston Section	Growth	Surrey		84,050,000	84,050,000	65%	
South Surrey Interceptor Rehabilitation	Maintenance	Delta		1,800,000	65,500,000	0%	
SSI - King George Section - Odor Control Facility (OCF) and Grit Chamber	Growth	Surrey		19,550,000	19,550,000	98%	Project substantially complete
SSI Influent Control Chamber Repair and Replace Gates	Maintenance	Delta		150,000	1,300,000	1%	project deferred to focus on higher priority work
SSI Sulfide Odour and Corrosion Control	Upgrade	Delta		9,550,000	9,700,000	23%	equipment procured.

Metro Vancouver
Liquid Waste Services - Capital Project Update
As of June 30, 2023

Project Name	Primary Driver	Project Location	Years	Approved Capital Budget	Current Estimated Total Project Cost	% Complete	Comment
			2023-2027 Capital Plan 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032				
Stoney Creek Sanitary Trunk	Growth	Burnaby		3,700,000	67,700,000	5%	
Surrey Corrosion Control Facility Replacement	Maintenance	Surrey		7,300,000	7,400,000	15%	
VSA Emergency Backup Power	Resilience	Vancouver		24,300,000	29,250,000	57%	5 out of the 9 genset projects are complete. (This includes the 2 temporary gensets for Chilco and Jervis)
VSA Flow Metering Program	Maintenance	Regional		1,900,000	5,800,000	15%	
VSA Grit Chamber Access Improvements	Maintenance	UEL - UEL		2,000,000	2,700,000	0%	
VSA Sewer Relocations and Protections	Maintenance	Regional		32,050,000	32,050,000	42%	multiple projects inc. Broadway Skytrain, VFPA, CPR, Senakw. majority of expenditure expected in 2023-24, but dependent on timing of third parties.
Westridge FM Replacement	Maintenance	Burnaby		7,600,000	8,550,000	27%	project delayed due to archaeological concerns and coordination with municipal works
Westridge Pump Stations 1 & 2 Refurbishment	Maintenance	Burnaby		2,800,000	19,750,000	9%	
White Rock Forcemain Rehabilitation	Maintenance	White Rock/Surrey		1,200,000	14,800,000	10%	
Works Yard	Maintenance	Burnaby		32,000,000	32,000,000	83%	land purchased
Total Collections				**1,066,300,000**	**2,099,900,000**		
Treatment Plants							
AIWWTP Ammonia Removal – Sidestream	Upgrade	Delta		1,000,000	127,250,000	1%	project being accelerated, but still in scoping stages
AIWWTP Chemical Lab UPS System Replacement	Maintenance	Delta		600,000	900,000	12%	
AIWWTP Cogen Building Refurbishment	Maintenance	Delta		1,500,000	1,500,000	97%	
AIWWTP Cogeneration Backup Power	Resilience	Delta		80,500,000	80,500,000	97%	contract substantially complete.
AIWWTP Electrical Distribution System Protection Control and Monitoring	Upgrade	Delta		2,650,000	2,650,000	54%	
AIWWTP Hydrothermal Processing Pilot	Opportunity	Delta		28,650,000	39,350,000	10%	
AIWWTP ICS Replacement Program	Maintenance	Delta		14,350,000	14,350,000	1%	3 areas of plant are being tendered for design
AIWWTP Influent System Remediation	Maintenance	Delta		2,400,000	82,600,000	1%	project being rescoped to address adjacent works
AIWWTP IPS Gates Replacements	Maintenance	Delta		700,000	700,000	75%	1 gate remaining. Remaining gates built under hydraulic gate replacement project
AIWWTP IPS Pump Building Roof Replacement Phase 2	Maintenance	Delta		-	800,000	0%	
AIWWTP Lubrication Storage Facility Conversion	Maintenance	Delta		500,000	500,000	0%	
AIWWTP O&M Building Refurbishment	Maintenance	Delta		-	9,600,000	0%	Deferred to start in 2024
AIWWTP Outfall Repair	Maintenance	Delta		1,550,000	1,550,000	0%	Contingency in case repair is required until new outfall and bypass pipe are complete
AIWWTP Replacement of ICS Equipment	Maintenance	Delta		4,450,000	4,450,000	97%	A few minor projects are progressing
AIWWTP Replacement of Protective Relays	Maintenance	Delta		3,350,000	3,050,000	71%	
AIWWTP Scheduled 64kV Potential & Current Transformer Replacements	Maintenance	Delta		800,000	400,000	30%	
AIWWTP Scum Pump Replacement	Maintenance	Delta		-	1,350,000	0%	future project
AIWWTP Secondary Clarifier Corrosion Repair	Maintenance	Delta		57,800,000	51,850,000	99%	substantially complete
AIWWTP Secondary Effluent Discharge Flowmeter Replacement	Maintenance	Delta		400,000	400,000	99%	substantially complete
AIWWTP Sludge Control Building Electrical Room HVAC upgrade	Maintenance	Delta		850,000	850,000	0%	
AIWWTP Spare Trickling Filter Pump & Motor Purchase	Maintenance	Delta		1,950,000	1,950,000	88%	Expected to finish this year.
AIWWTP Station Battery Replacement	Maintenance	Delta		1,250,000	1,250,000	99%	substantially complete
AIWWTP Trickling Filter Media & Distributor Arms & Ducting Replacement	Maintenance	Delta		90,700,000	90,700,000	70%	3 of 4 units refurbished, last unit deferred to 2024, with some additional duct work in 2025.
AIWWTP UPS Condition Monitoring System	Resilience	Delta		-	550,000	0%	future project
All WWTPs Power Quality Monitoring & Outage Alarming Network	Upgrade	Regional		3,000,000	3,000,000	95%	substantially complete

Metro Vancouver
Liquid Waste Services - Capital Project Update
As of June 30, 2023

Project Name	Primary Driver	Project Location	Years	Approved Capital Budget	Current Estimated Total Project Cost	% Complete	Comment
			2023-2027 Capital Plan 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032				
Annacis Influent System Surge Control Refurbishment	Growth	Delta		22,000,000	22,000,000	45%	
Annacis MCC 80 051, 80 070, 80 071 Replacement	Maintenance	Delta		2,850,000	2,850,000	95%	
Ferguson Road Paving Refurbishment	Upgrade	Richmond		2,100,000	1,000,000	98%	substantially complete
IIWWTP - Biogas Lines Relocation	Resilience	Richmond		5,750,000	4,800,000	95%	substantially complete
IIWWTP Biosolids Dewatering Facility	Upgrade	Richmond		61,300,000	61,300,000	97%	substantially complete, but warranty issues are delaying final commissioning.
IIWWTP CEPT Polymer Line Replacement	Maintenance	Vancouver		300,000	2,300,000	1%	work to be tendered this year
IIWWTP CEPT Winterization	Maintenance	Vancouver		1,500,000	1,500,000	0%	work to be tendered this year
IIWWTP ICS IPS Control Replacement	Maintenance	Richmond		1,750,000	1,750,000	30%	Design being reviewed. Construction to start this
IIWWTP ICS Migration Program	Maintenance	Vancouver		-	12,000,000	0%	future project
IIWWTP ICS Replacement Program	Maintenance	Richmond		750,000	750,000	1%	some smaller system designs started
IIWWTP Influent Gate Refurbishment	Maintenance	Richmond		1,350,000	1,350,000	41%	
IIWWTP IPS Drive Remediation	Maintenance	Richmond		1,400,000	2,300,000	7%	
IIWWTP MCC/Power Distribution Assess/Replace - Phase 2	Maintenance	Richmond		1,000,000	1,000,000	60%	
IIWWTP Non-Domestic Trucked Liquid Waste Alternative	Maintenance	Regional		800,000	800,000	0%	Project deferred to work on higher priority items
IIWWTP PA Tanks Improvement	Maintenance	Richmond		6,500,000	6,500,000	0%	project delayed due to staffing issues
IIWWTP PA-Sed Tank & Gallery Wall Refurbishment	Maintenance	Richmond		200,000	950,000	0%	project delayed due to staffing issues
IIWWTP Replacement of CoGen Control System	Maintenance	Richmond		2,500,000	2,500,000	70%	
IIWWTP Siphon Chamber Refurbishment	Maintenance	Richmond		200,000	2,150,000	0%	project delayed due to staffing issues
IIWWTP Surge Mitigation	Maintenance	Vancouver		250,000	2,000,000	0%	scoping underway
IIWWTP Solids Handling Refurbishment	Maintenance	Richmond		64,850,000	64,850,000	98%	substantially complete
IIWWTP Standby Diesel Generators	Resilience	Richmond		2,000,000	5,000,000	1%	on hold for scoping
Iona Island Control & Instrumentation Replacement 2011	Maintenance	Richmond		2,750,000	2,750,000	77%	ICS logic tests planned for summer
LIWWTP Admin Dewatering Building Roof Repair	Maintenance	Richmond		100,000	800,000	0%	past repairs have been successful. Defer to 2024
LIWWTP Biogas Clean-up Project	Opportunity	Richmond		13,800,000	13,800,000	99%	substantially complete
LIWWTP CCT Isolation Gates	Maintenance	Richmond		2,050,000	2,050,000	98%	substantially complete
LIWWTP Effluent Heat Recovery Project	Opportunity	Richmond		10,000,000	10,000,000	2%	preliminary design complete
LIWWTP Gravity Thickener Redundancy	Maintenance	Richmond		500,000	21,400,000	0%	delayed due to staffing
LIWWTP Ground Fault Detection System Replacement	Maintenance	Richmond		1,550,000	1,550,000	2%	
LIWWTP High Efficiency Boiler	Maintenance	Richmond		1,300,000	1,300,000	17%	
LIWWTP ICS Electrical Distribution System Migration Program	Maintenance	Richmond		-	7,000,000	0%	future project
LIWWTP ICS Replacement Program	Maintenance	Richmond		6,750,000	6,750,000	39%	Design being reviewed
LIWWTP PA-Sed Tank Refurbishment	Maintenance	Richmond		4,150,000	4,150,000	10%	design complete
LIWWTP Pilot Digestion Optimization Facility	Opportunity	Richmond		4,850,000	5,200,000	90%	facility in commissioning phase
LIWWTP Power Reliability	Resilience	Richmond		12,400,000	12,400,000	26%	equipment procured. Installation contract for voltage regulators awarded. Generator contract to be let later this year.
LIWWTP SCL Refurbishment	Maintenance	Richmond		850,000	34,000,000	0%	delayed due to staffing
LIWWTP Trickling Filter Refurbishment	Maintenance	Richmond		500,000	54,450,000	0%	delayed due to staffing
NLWWTP Screw Pump Replacement	Maintenance	Langley Township		1,550,000	1,550,000	84%	substantially complete
NLWWTP Standby Diesel Generator	Resilience	Langley Township		1,000,000	1,000,000	0%	project in scoping
NLWWTP 25 kV Substation Replacement	Maintenance	Langley Township		10,100,000	10,100,000	94%	substantially complete
WWTPs Electrical System Studies & Upgrades	Resilience	Regional		750,000	1,900,000	22%	
Total Treatment Plants				**553,250,000**	**913,850,000**		
Grand Total Liquid Waste Services				**1,619,550,000**	**3,013,750,000**		

ATTACHMENT 1B

Metro Vancouver
Liquid Waste - Project Delivery - Capital Project Update
As of June 30, 2023

Project Name	Primary Driver	Project Location	Years	Approved Capital Budget	Current Estimated Total Project Cost	% Complete	Comment
			2023-2027 Capital Plan 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032				
Treatment Plants							
AIWWTP Digester No. 5	Growth	Delta		6,900,000	455,700,000	0%	Delayed due to staff availability.
AIWWTP Stage 5 Expansion	Growth	Delta		944,100,000	1,004,350,000	54%	Detailed design of Phase 2 Remaining Works delayed. Completion of construction anticipted in 2030.
Annacis Outfall System	Growth	Delta		356,050,000	356,050,000	85%	Outfall construction is approximately 85% complete.
Biosolids Dryer	Opportunity	Delta		22,700,000	448,150,000	4%	Feasibility study being updated. Overall project start delayed due to staff availability.
IIWWTP Outfall Refurbishment	Maintenance	Vancouver		20,000,000	325,000,000	1%	
Iona Secondary Wastewater Treatment - Phase 1	Upgrade	Richmond		1,060,000,000	9,944,800,000	2%	Baseline budget and schedule has been established as part of final Project Definition Report and Stage Gate 1 approval in March 2022. Schedule is 5-years beyond regulatory deadline.
North Shore WWTP Secondary Upgrade, Conveyance and Decommissioning	Upgrade	Dist of North Van		1,057,900,000	1,057,900,000	55%	Construction of treatment plant 37% complete. Design Build Finance contract terminated. New Designer and Contractor engaged for detailed design and construction execution planning. Update expected Q3 2023.
Northwest Langley Wastewater Treatment Program	Growth	Langley Township		2,280,650,000	2,280,650,000	15%	The Northwest Langley WWTP Expansion Project successfully passed the detailed design stage gate on June 2, 2023. The new Pump Station, SSO tank and River Crossing projects are all expected to be completed in 2023 as scheduled.
Total Treatment Plants				**5,748,300,000**	**15,872,600,000**		
Grand Total Liquid Waste - Project Delivery				**5,748,300,000**	**15,872,600,000**		

ATTACHMENT 2

Capital Project Status Information
June 30, 2023

GREATER VANCOUVER SEWERAGE & DRAINAGE DISTRICT (Liquid Waste Services)

The majority of projects under the GVS&DD Capital Program are delivered by the Liquid Waste Services Department. The following narrative provides details and status updates on the more significant of these projects. Seven projects (as identified in Attachment 1B), are being delivered by the Project Delivery Department. As those projects provide separate updates to the Liquid Waste Committee and GVS&DD Board, no additional information on them is provided here.

Infrastructure Growth Program

- **FSA – Burnaby Lake North Interceptor – Winston Street Section** – Phase 1 of the work was completed in 2021. In 2022, GVS&DD awarded Pomerleau Bessac Infrastructure (PBI) a contract for Phase 2 of the project, which involves 2.9 km of 2134 mm diameter plastic-lined concrete pipe, to be installed by tunneling. The tunneled section follows Winston Street, starting 140m south of Greenwood Street, extending east up to approximately 500m west of the junction with Brighton Avenue. Construction began in May 2022. Currently, there is a schedule delay of about 4 months due to tunneling issues. Projected completion date is Q4 2024. To date, 4 of 5 shafts have been completed, and 750 m of sewer has been installed.

- **FSA - Annacis Island WWTP Outfall – Surge Control -** This project involves the replacement of four hydraulic gates as well as ancillary equipment in the east and west channel inside the Influent Control Chamber. The work will mitigate the risk of transient surges (water hammer) to upstream infrastructure. The GVS&DD awarded the construction contract to Maple Reinders Construction Limited in March 2021. The project is delayed by one year to allow safe access during the low flow summer period. Long lead equipment has since been delivered, and construction for east channel hydraulic gate replacements is well underway, which had started on May 29, 2023. Overall construction is approximately 64% complete. Work in the west channel that was expected to be completed in the summer of 2023, has been moved to Summer 2024. Substantial completion is expected to be in late-Q3 2024.

- **FSA - North Road Trunk Sewer No. 2 –** Construction of Phase 1A covering the sections between Brunette River and Lougheed Highway was completed in 2020. Construction of Phase 1B involving a railway crossing is pending for resolution of property issue with Burlington Northern Santa Fe Railway. The Phase 2 construction contract, involving replacement of the existing 250mm/300mm diameter sewer with 1.3 km of new 450mm and 600mm diameter sewer between Lougheed Highway and Clarke Road, was executed in late May 2023. Construction is scheduled to commence in August of 2023, and construction completion is expected in 2025.

Infrastructure Maintenance Program

- **LSA – Gilbert Trunk Sewer Twinning** – The Gilbert Trunk Sewer No 2 project was divided into four phases, and the construction of Phase 1 and 2 is complete. The remaining 2 Phases have a total length of 4.7 km consisting of 1.8 m diameter sewers. The construction of Phase 3, between Blundell Road and Steveston Highway, was awarded to BD Hall on October 28, 2022. Phase 3 started construction in Spring 2023. Approximately 55m of sheet pile shoring has been installed to date, and pipe installation is expected to commence towards the end of July. The construction of Phase 4, from Steveston Highway to the Lulu Island WWTP, was awarded to Jacob Brothers on July 29, 2022. Phase 4 started construction in Spring 2023. Construction of a second access bridge to the treatment plant is complete. Approximately 260m of pipe has been installed to date, and construction of the junction chamber at the treatment plant is approximately 20% complete. Both phases are expected to be complete in fall 2025.

- **NSSA – Gleneagles Pump Station Improvements –** This project involves upgrading or replacing five existing wastewater pump stations located in West Vancouver in order to replace aging equipment, expand system capacity, and meet seismic standards. A $14M contract was awarded to Industra Construction in December 2022 for major upgrades to both Gleneagles 4 and 5. The Notice to Proceed was issued to Industra Construction in June 2023. Construction began at Gleneagles 5 in July 2023 with completion scheduled for 2024, followed by construction at Gleneagles 4 in 2024-2025. Gleneagles 3 began the conceptual design phase in December 2022, which is expected to conclude in 2023. Gleneagles 1 and 2 are in the preliminary design phase and staff are working closely with the District of West Vancouver in order to optimize design and construction. Preliminary design for Gleneagles 1 and 2 is scheduled to be complete in 2024.

- **FSA – River Scour Protection Program – Scour Protection at Maple Ridge Forcemain, Fraser River Crossing -** The Maple Ridge Forcemain under the Fraser River was constructed in 1981 and consists of twin 762 mm diameter steel pipe. The crossing is about 400 m downstream of Barnston Island where the river is about 600 m wide. The river channel has recently experienced scour, which posed a risk to the forcemain. This project involves adding additional rip rap to the existing scour protection apron. The work was tendered in Q4 2022 and JJM Construction began construction on January 3, 2023 and was substantially completed on February 8, 2023. Additional scour protection projects will be completed in 2023 and 2024 at other crossings.

- **FSA – River Scour Protection Program – Scour Protection at North Surrey Interceptor / Annacis Main No. 3, Fraser River Crossing** – North Surrey Interceptor / Annacis Water Main No. 3, Fraser River Crossing was constructed in 1973 and consists of three stacked lines: 1-1200mm steel pipe (NSI); 1-660mm steel sewer pipe (NSI) and 1-1200mm steel water pipe (AN3). The AN3/NSI passes under the South Arm approximately 900m downstream of the trifurcation point. The work includes the supply and installation of a scour protection apron. The west portion of the apron blends into the existing 1995 blended rock apron and extends the scour protection further upstream and downstream of the pipeline alignment. The east portion of the apron extends 25m upstream and downstream of the pipeline alignment. Both portions are 1m thick. The contract was awarded in December 2022. Construction began on January 31, 2023 and was substantially completed on February 28, 2023.

- **FSA - Crescent Beach FM Replacement** – This project involves the design and construction of approximately 2 km of 1.2 m diameter sanitary force main to replace the existing 500 mm

diameter FRP (fiber reinforced plastic) pipe which is aging and in poor condition. The GVS&DD awarded the construction contract to JJM Construction in July 2021. Construction started in the fall of 2021, and unforeseen ground conditions and property challenges have delayed the project. The project is now planned to be complete by the end of 2023. As of the end of June 2023, 1060 m of pipe has been installed, including the trenchless crossings of Highway 99 and the BCR railway

- **FSA - New Westminster Interceptor Repair – Columbia Street Section** – This project involves the rehabilitation of 1.6 km of the 1.5 m diameter New Westminster Interceptor from Front St. to McBride Blvd in New Westminster. Oscar Renda Contracting of Canada was awarded the construction contract starting July 2021. The contract achieved completion at the end of April. Some portions of the work have been removed from ORCC's contract due to schedule and access issues with the Patullo Bridge Replacement Project, and will be completed at future date.

- **FSA – Annacis Island WWTP Trickling Filter Media, Distributor and FOA Duct Replacement –** This project involves replacing the rotary distributors, plastic media and foul air ducting for the four Trickling Filters (TF) at the AIWWTP. These components have been in service for over 20 years and are reaching the end of their service life. The distributors and ducting have experienced significant corrosion, resulting in equipment failures that required emergency maintenance. Construction is being completed under two contracts. The first contract was awarded to Maple Reinders Construction Ltd., in 2019 for the rehabilitation of TF 1 and 3, and has been completed. The work for TF 2 and TF 4 was awarded to Pomerleau in 2021. A significant portion of Pomerleau's contract work has been completed to date. However, due to foreseen mechanical issues with the TFs (unrelated to this contract), the remaining work in TF 4 and TF 2 will be completed in 2024 and 2025, respectively.

<u>Infrastructure Resilience Program</u>

- **VSA – Emergency Backup Power** - This project involves design, supply and installation of standby emergency backup generators at the Chilco, Columbia, Harbour, Hudson, Jervis, Kent and Willingdon pump stations to allow the stations to remain operational during power failure events and reduce the risk of a spill. Backup generators for Harbour, Hudson, Kent, Willingdon and Columbia pump stations have all been completed and commissioned in 2021. The two remaining pump stations are Chilco and Jervis, which will have temporary generators installed by end of 2023 or early 2024. The Notice to Proceed for the Jervis temporary generator has been issued in Q2 of 2023, and construction is scheduled to commence in September 2023. The Chilco temporary generator contract will be issued in Q3 of 2023. The detail design, RFP, permitting and property requirements for the Jervis PS permanent generator are complete. The tender for the permanent works will be issued in Q3 of 2023. The Chilco PS permanent generator concept is under review by the Vancouver Parks Board, prior to starting the detailed design.

- **Lulu Island Wastewater Treatment Plant Power Reliability** - The project involves the design, supply and installation of a backup diesel generator and two voltage sag fighters. The backup diesel generator in a dedicated generator building will provide 2.75 MW power to minimize downtime and maintain the critical operations during longer term power outages. The design for diesel generator and its building will be completed by Q1 of 2024, with pre-purchase equipment being awarded by Q4 of 2023. Construction is scheduled to start in 2024 and complete by 2025. The supply and installation of voltage sag fighters is upgrading the primary treatment process' main power distribution system, in order to maintain a

continuous process operation for effluent regulatory compliance during utility voltage sagging. The equipment was purchased and received, and the Notice to Proceed was issued in June, 2023. Construction substantial completion is scheduled for Q3 of 2024.

Infrastructure Upgrade Program

- **VSA – Iona Island WWTP Biosolids Dewatering Facility** – This project involves the construction of a biosolids dewatering facility. This facility will significantly increase the dryness of biosolids produced the Iona Island WWTP. MV incurs significant cost to haul biosolids to reuse and disposal sites. By increasing biosolids dryness, the weight and volume of the hauled material will be reduced, resulting in cost, fuel and greenhouse gas emission reductions. This facility will allow the decommissioning of the four existing digested sludge lagoons and the sludge drying area, which in turn will provide space for construction of new tertiary treatment facilities at Iona Island WWTP. The $52 million design-build contract for the project was awarded to NAC Constructors in April, 2019. The design phase was completed in 2020 and construction was completed in December, 2022. The contractor is currently addressing an equipment deficiency discovered during commissioning. The dewatering facility is expected to be handed over for owner-commissioning by MV Staff in Q3 of 2023.

Opportunity Program

- **FSA – Annacis Island WWTP Hydrothermal Liquefaction** – This project involves the design and construction of a demonstration-scale plant to convert wastewater biosolids to bio-crude oil, which can be used as a low carbon fuel. The demonstration scale plant will be used to assess technology performance and feasibility of full-scale implementation of the hydrothermal liquefaction technology at WWTPs. The HTL system design is anticipated to be completed in Q3 of 2023. The entire HTL demonstration plant is scheduled to be constructed in 2025 and gradually put in operation from 2025 to 2027.

- **LSA – LIWWTP Pilot Digestion Optimization Facility (PDOF)** - The PDOF was designed to enable evaluation of optimization techniques for the existing anaerobic digestion process, as well as the development of emerging anaerobic digestion processes. The facility would allow testing of these processes without risking full-scale operations. Lessons learned at the pilot scale would be incorporated in MV facilities, potentially resulting in improved efficiency of the existing digesters, will postpone the need for digester system expansion. The PDOF is designed to be adaptable and transportable (being built in modules) to other MV facilities (such as AIWWTP or ARC) for further research and testing purposes. Staff from O&M and PPA, in cooperation with UBC Okanagan research staff, will be conduct experimentation following the commissioning of the facility.

  The GVS&DD awarded the PDOF fabrication and installation contract to Tritech in Q1 2021. Fabrication and installation reach substantial complete in March of 2023, and the owner's commissioning was completed in June of 2023. The system is expected to be commissioned and turned over to Lulu Operations & Maintenance by end of July of 2023.

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Zero Waste Committee

From: Jessica Yamamoto, Assistant Project Engineer, Solid Waste Services

Date: September 6, 2023 Meeting Date: September 14, 2023

Subject: **Summary of Municipal Waste Collection Service Models**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 6, 2023, titled "Summary of Municipal Waste Collection Service Models".

EXECUTIVE SUMMARY

Metro Vancouver member jurisdictions typically provide or coordinate solid waste collection services for single family properties in the region. Currently, 84% of the single family properties in Metro Vancouver receive every-other-week garbage collection and 95% receive weekly green bin collection. The majority of single family residences in the region receive weekly multi-stream recycling collection using bags and bins, with the remainder receiving every-other-week single stream recycling collection using wheeled carts. Members fund single family garbage and green bin programs through utility fees, property taxes, or a combination of both. Residential recycling of packaging and paper is funded through Recycle BC with the service provided by the municipalities under contract with Recycle BC or directly by Recycle BC. Most municipalities have a standard set of material collected as determined by Recycle BC. Any deviation from the standard requires specific approval by Recycle BC.

PURPOSE

The purpose of this report is to provide the Zero Waste Committee with information on solid waste collection services provided to single family residential properties in Metro Vancouver.

BACKGROUND

In April 2016 the GVS&DD Board received a report titled “Single Family Every-Other-Week Garbage Collection – Status Update” (Attachment 1) describing how approximately 70% of the region’s population residing in single family homes were receiving every-other-week garbage collection. The report described how, with the inclusion of food scraps in green bin programs, switching to every-other-week garbage collection while increasing to weekly organics collection resulted in an average of 33% less garbage requiring disposal.

In February 2023 Zero Waste Committee members requested information on solid waste collection services provided to single family residential properties[1] in the region.

[1] There are variations across the region in what is considered a single family home for the purpose of solid waste collection. Examples include detached homes, homes with a secondary suite, homes with a laneway house, and houses converted to duplexes, triplexes and fourplexes.

SINGLE FAMILY PROPERTY SOLID WASTE COLLECTION PROGRAMS IN METRO VANCOUVER

In most cases, Metro Vancouver members manage the collection of garbage and green bin organics from single family properties within their jurisdiction. Packaging and paper are managed under the Recycle BC program with collection either through the municipality under contract with Recycle BC or directly by Recycle BC. While there are many similarities across the region in terms of collection services provided by members, there are instances where services are different depending on the needs and circumstances of individual members. The following sections provide a summary description of garbage, green bin, and recycling collection programs for single family homes across the region. Details of the services provided in each member jurisdiction are included in Table 1 below.

Table 1: Garbage, Green Bin and Recycling System Models

Member	Garbage Collection Frequency	Green Bin Collection Frequency[3]	Recycling Collection Frequency	Recycling Streams and Materials Collected
Anmore	every-other-week	weekly	weekly	2 streams Separate paper, containers
Belcarra	N/A[1]	N/A[1]	N/A[1]	N/A
Bowen Island	every-other-week	weekly	N/A[1]	N/A
Burnaby	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Coquitlam	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Delta	weekly	weekly	weekly	3 streams Separate paper, containers, glass
Langley City	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Langley Township	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Lion's Bay	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Maple Ridge	N/A[1]	N/A[1]	weekly	4 streams Separate paper, cans and cartons, glass, plastic containers
New Westminster	every-other-week	weekly	every-other-week[4]	2 streams In cart - combined paper, plastic and metal containers; In bin - non-refundable glass (collected monthly)

North Vancouver City	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
North Vancouver District	weekly	weekly	weekly	3 streams Separate paper, containers, glass
Pitt Meadows	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Port Coquitlam	every-other-week	weekly	every-other-week[4]	1 stream Combined paper and containers Glass drop off only
Port Moody	every-other-week	weekly	every-other-week[4]	2 streams In cart - combined paper, containers; In bin - non-refundable glass (collected monthly)
Richmond	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
Surrey	every-other-week	weekly	every-other-week[4]	1 stream Combined paper and containers Glass drop off only
Tsawwassen First Nation[2]	weekly	weekly	weekly	1 stream All combined
Vancouver	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
West Vancouver	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass
White Rock	every-other-week	weekly	weekly	3 streams Separate paper, containers, glass

[1] Residents are responsible for bringing their material to a recycling depot or waste facility.
[2] Residents must opt in to municipal waste collection for garbage, recyclables and organics.
[3] Some members change green bin collection frequency and capacity seasonally.
[4] Collect mixed recycling in large carts every-other-week.

Garbage and Green Bin Collection

Overall, 84% of the single family properties in the region receive every-other-week garbage collection. With the exception of jurisdictions where residents rely primarily on depots or where residents individually contract for services, all members provide weekly green bin collection service (food scraps with yard trimmings) to single family properties.

Recycling Collection
Most single family residences in the region are provided with weekly multi-stream recycling collection of paper products, plastic and metal containers, and glass using bins and bags. Other single family home residents are provided with every-other-week mixed stream recycling collection using large carts. Collection service is either through the municipality under contract with Recycle BC or is provided directly by Recycle BC through a contractor. Most municipalities have a standard set of material collected as determined by Recycle BC. Any deviation from the standard requires specific approval by Recycle BC.

ALTERNATIVES
This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS
There are no financial implications to Metro Vancouver for garbage, green bin and recycling collection services provided to single family properties within member jurisdictions. Those services are funded by the municipalities through either utility fees or property taxes.

CONCLUSION
This report summarizes single family residential waste collection schedules and programs provided across the region. The provision of regular green bin and recycling collection to single family residential properties across the region has likely contributed to the increase in recycling rates and the decrease in disposal rates seen in recent years with the current recycling rate at 65%.

Attachments
1. Report titled “Single Family Every-Other-Week Garbage Collection – Status Update” dated, April 7, 2016

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ATTACHMENT 1

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Zero Waste Committee

From: Marcel Pitre, Division Manager, Solid Waste Services

Date: April 7, 2016 Meeting Date: April 14, 2016

Subject: **Single Family Every-Other-Week Garbage Collection – Status Update**

RECOMMENDATION

That the GVS&DD Board receive the report titled "Single Family Every-Other-Week Garbage Collection – Status Update", dated April 7, 2016 for information.

PURPOSE

This report presents disposal and recycling data outlining the effects of every-other-week garbage collections programs on the single-family sector.

BACKGROUND

In recent years, many municipalities have modified the single-family waste collection system to include weekly residential food scraps collection in their existing yard trimmings bin. In conjunction with this change, municipalities have also implemented every-other-week garbage collection to further promote the use of the food scraps diversion programs and to maintain or reduce truck trips.

Metro Vancouver has been tracking the effects of this shift on both the garbage and recycling tonnages in the region. This report outlines some key performance metrics of that program and lessons learned in implementation and operation.

EFFECTS ON RESIDUAL GARBAGE AND RECYCLING TONNAGES

Currently, approximately 70% of the single family population in the region have every-other-week garbage collection. On average, municipalities that use the system dispose of 109 kg/person per year versus 148 kg/person per year for those who collect garbage every week.

In order to estimate the performance and effects of switching to every-other-week garbage collection, Metro Vancouver has investigated disposal tonnages before and after the change. On average, municipalities that have changed their collection method have seen a 33% reduction in the tonnage of waste disposed with reductions ranging from 26% to 43%. A reduction of 33% in garbage for 70% of the single family population in the region translates to a reduction in 58,000 tonnes per year of garbage.

Changes to every-other-week garbage collection have in many cases been implemented in parallel with expansion of organics collection programs. Typically organics collection has been expanded to include all food scraps and organics collection has been changed from every-other-week to weekly. The change in recycling and organics quantities following implementation of every-other-week garbage collection is more difficult to calculate than changes in garbage disposal. Other factors such as decreasing newsprint and changes in packaging seem to have the biggest impact on recycling quantities. Organics collection in communities with every-other-week garbage collection saw on

average an increase of over 30% in organics collection following implementation of every-other-week garbage collection.

As noted above, some of the change in recycling and organics collection could be attributed to changes in those programs implemented in parallel to every-other-week garbage collection.

Changes to every-other-week garbage collection has not resulted in any significant increases in small vehicle traffic at transfer stations.

The Attachment shows examples of 3 municipalities' monthly disposal tonnages before and after every-other-week garbage collection with associated percent increases in annual recycling tonnage.

IMPLEMENTATION CHALLENGES

As with most changes to waste and recycling collection programs, challenges may need to be overcome. In the case of the implementation of every-other-week collection, in conjunction with weekly food scraps collection, there challenges related to: infrastructure, service level (capacity), operations, contamination and dumping in other systems.

Infrastructure

Municipal infrastructure requirements for the implementation is dependent on each municipalities' particular needs and whether or not the program is made in conjunction with another program such as food scraps collection or special carts for automated collection. There may be a requirement to add a larger collection bin if requested by residents, dispose of old bins or add a collection vehicle.

Service Level

In many cases, municipalities had received requests to increase the capacity of the disposal bin as part of switching to every-other-week garbage collection. In addition, some municipalities offered exemptions for special cases where an every-other-week frequency would not be sufficient (.In general, municipalities received service requests or complaints early in the deployment of the new programs and those requests dropped off shortly thereafter.

Operations

The implementation of every-other-week garbage collection may involve a re-routing evaluation for not only the garbage collection schedules, but also the organics routes. The increase in volume of organics may require route compression, the addition of a collection trip or an additional vehicle to the fleet.

Contamination or dumping in other systems

As new programs are put in place, there is a learning period for the residents that may cause an increase in contamination of the recycling streams. Some municipalities needed to allow for extra education, lettered communications, pre-collection inspections and/or tagging of bins to address the issue and meet the contamination requirements of the organics processor(s). In some instances, an increase in household waste had been noted in public space waste containers. Similarly, this may also lead to household waste ending up in commercial dumpsters.

ALTERNATIVES

This is an information report and therefore no alternatives are presented.

FINANCIAL IMPLICATIONS

Costs related to the implementation of every-other-week garbage collection fall under the responsibility of each individual municipality. The decision to implement such a program would be evaluated on a case by case basis taking into account a number of capital and operational requirements.

SUMMARY

Currently, approximately 70% of the single family population in the region have every-other-week garbage collection. On average, municipalities that have changed their collection method have seen a 33% reduction in the tonnage of waste disposed. On average, municipalities that use the system dispose of 109 kg/person per year versus 148 kg/person per year for those who collect garbage every week. When comparing the year previous and the year after the implementation, organics tonnages have increased by an average of over 30%.

This change to the waste and recycling collection program creates challenges relate to: infrastructure, service level (capacity), operations, contamination and dumping in other systems. There may be a requirement to add a larger collection bin, dispose of previous bins, change or compress garbage or organics routes or add a collection vehicle in rare cases. In general, municipalities received service requests or complaints early in the deployment of the new programs and those requests dropped off shortly thereafter.

The implementation of every-other-week garbage collection has had a notable reduction on the amount of waste disposed and an increase in recycling tonnages. There are a number of factors that influence waste reduction and diversion on a case-by-case basis. Despite challenges, the implementation of this program on its own or in conjunction with other diversion and education programs has had a significant impact on disposal behavior and has benefited many municipalities of Metro Vancouver.

Attachments and References:

Attachment – Municipal monthly garbage tonnage change and corresponding recycling change

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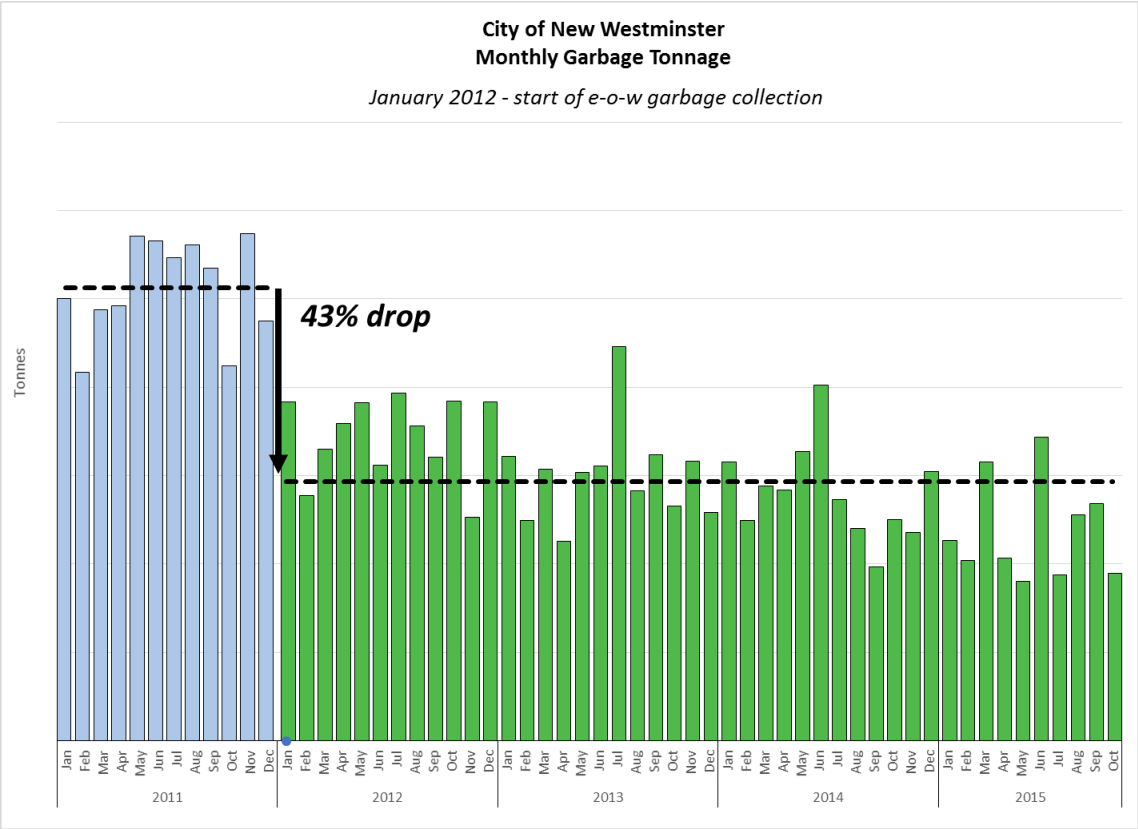
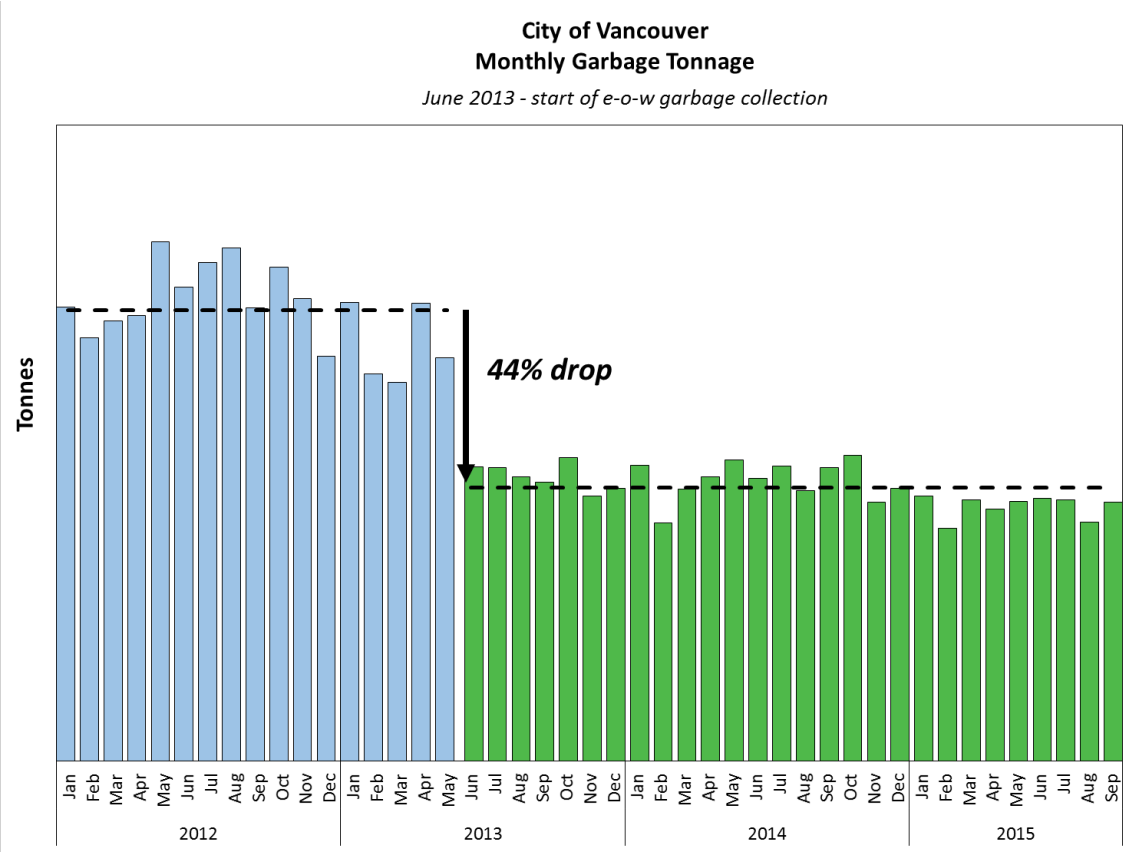
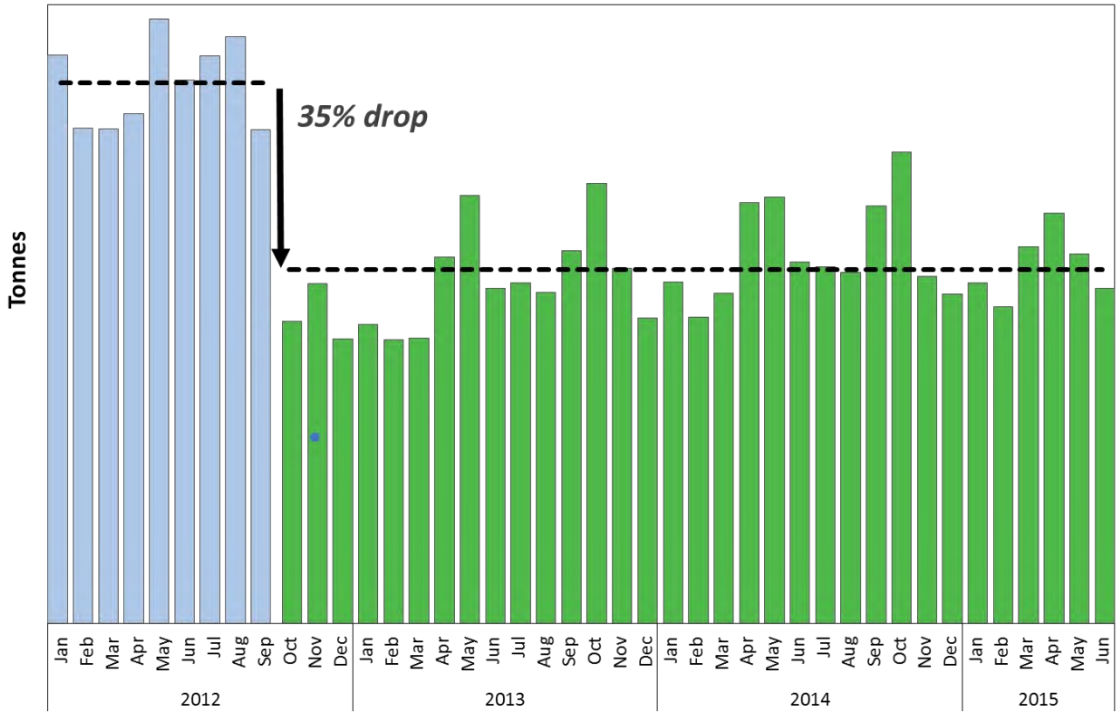

City of New Westminster
Monthly Garbage Tonnage
January 2012 - start of e-o-w garbage collection
Tonnes
43% drop
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2011
2012
2013
2014
2015


City of Vancouver
Monthly Garbage Tonnage
June 2013 - start of e-o-w garbage collection
Tonnes
44% drop
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2012
2013
2014
2015

City of Surrey
Monthly Garbage Tonnage
October 2012 - start of e-o-w garbage collection



To: Zero Waste Committee

From: Brent Kirkpatrick, Lead Senior Engineer, Solid Waste Operations,
Solid Waste Services

Date: September 7, 2023 Meeting Date: September 14, 2023

Subject: **Waste-to-Energy Facility Environmental Monitoring and Reporting 2022 Update**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 7, 2023, titled "Waste-to-Energy Facility Environmental Monitoring and Reporting 2022 Update."

EXECUTIVE SUMMARY

This report provides the Waste-to-Energy environmental performance update for 2022.

All air emission related parameters monitored during 2022 were similar to 2021, and well below regulatory limits in the Waste-to-Energy Facility Provincial Operational Certificate. The Waste-to-Energy Facility's contributions of nitrogen dioxide, fine particulates and anthropogenic (human caused) greenhouse gases are less than 1% of regional emissions.

In the fall of 2020 Metro Vancouver began monitoring ambient air parameter concentrations at a temporary air monitoring station immediately adjacent to the Waste-to-Energy Facility, and installed additional monitoring equipment at an existing monitoring station near the facility. Sulphur dioxide and hydrogen chloride ambient levels at less than 10% of ambient air objectives at both stations. Ninety-eight percent of the time, ambient sulfur dioxide and hydrogen chloride concentrations were less than 3% of ambient objectives. Ambient nitrogen dioxide levels are within ambient air quality objectives and lower than many other monitoring stations within the region. Analysis suggests that other regional sources are the primary drivers of ambient concentrations of these pollutants at both ambient air monitoring stations. Metro Vancouver is working on a request to the Province of British Columbia to amend the Waste-to-Energy Operational certificate to reflect the low ambient concentrations of sulfur dioxide and hydrogen chloride.

PURPOSE

The purpose of this report is to provide the Zero Waste Committee with an annual overview of the Waste-to-Energy Facility's environmental monitoring program and implementation of Provincial Operational Certificate requirements.

BACKGROUND

Metro Vancouver continuously monitors the environmental performance of the Metro Vancouver Waste-to-Energy Facility and, since 2010, annual environmental performance summaries have been provided to the Zero Waste Committee.

This report provides updates on the facility's 2022 environmental performance and the implementation of the Waste-to-Energy Facility Provincial Operational Certificate requirements. The report is identified in the Zero Waste Committee annual work plan.

ENVIRONMENTAL MONITORING AND REPORTING UPDATE

Since the Waste-to-Energy Facility opened in 1988, Metro Vancouver has continually reduced emissions through assessment, operational and plant infrastructure improvements, and environmental controls. All air emission related parameters monitored during 2022 were in compliance with the requirements of Operational Certificate 107051. A summary of historic annual emission performance, including 2022 data, is found in Attachment 1.

To assess regulatory compliance, measurements from the environmental monitoring program are compared to the regulatory limits specified in the Waste-to-Energy Facility Operational Certificate 107051 issued by the BC Ministry of Environment and Climate Change Strategy. Results are reported in the following ways:

- Monthly compliance reports, which provide a summary of all air emissions monitoring results for each month, are provided to the BC Ministry of Environment and Climate Change Strategy, City of Burnaby, and Fraser Health Authority; and are posted publicly on the Metro Vancouver website;
- Manual stack testing is conducted by an independent stack testing company four times per year for particulate matter, trace metals, and hydrogen fluoride. Results are provided to the BC Ministry of Environment and Climate Change Strategy, City of Burnaby, and Fraser Health Authority; and are posted publicly on the Metro Vancouver website;
- Manual stack testing for semi-volatile organic compounds is conducted once per year by an independent stack testing company and results are provided to the BC Ministry of Environment and Climate Change Strategy, City of Burnaby, and Fraser Health Authority; and are posted publicly on the Metro Vancouver website;
- Annual reporting of greenhouse gas emissions is provided to the BC Ministry of Environment and Climate Change Strategy and Environment and Climate Change Canada; and
- Annual reporting of substances emitted to air and contained in ash transferred for off-site disposal is provided to Environment and Climate Change Canada for the National Pollutant Release Inventory.

Environmental Monitoring Program

The 2022 Waste-to-Energy Facility environmental monitoring program consisted of the following:

- Air Emissions Monitoring – Continuous Emission Monitoring System:
    - The Waste-to-Energy Facility is equipped with a real-time flue gas continuous emission monitoring system that measures and records emission parameters at the exit of the air pollution control plant 24 hours per day, seven days a week, using a United States Environmental Protection Agency certified and auditable tracking system.

  - The following parameters are measured: sulphur dioxide, nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen chloride, total hydrocarbons, and opacity.
  - The following key operational parameters are also monitored: furnace temperature, total flue gas flow, flue gas moisture, and flue gas oxygen. This monitoring provides an indication of plant operational conditions and helps confirm that emissions monitored by manual stack testing are accurate.

- Air Emissions Monitoring – Periodic Manual Stack Testing:
  - Triplicate tests are conducted four times per year on each of the three plant lines to measure particulate matter, trace metals, and hydrogen fluoride.
  - A single test is conducted annually on one boiler (rotating between boilers each year) in triplicate to monitor for semi-volatile organic compounds, including dioxins and furans, chlorobenzenes, chlorophenols, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons.

- Fly and Bottom Ash Monitoring:
  - Each fly ash load is tested prior to transport and disposal.
  - Bottom ash samples are collected from each truck loaded with bottom ash for transport and disposal. Samples are combined to form a weekly composite sample for analysis.
  - On May 20, 2021, the Ministry of Environment and Climate Change Strategy approved Metro Vancouver's 2020 Bottom Ash Management Plan. The 2020 Plan allows for the potential beneficial use of bottom ash that has been processed through the Waste-to-Energy Facility's non-ferrous metal recovery system at cement plants. Metro Vancouver has contracted Birco Environmental Services to conduct a pilot test in support of the beneficial use of bottom ash.

Comparison with Regulatory Limits

Table 1 and Attachment 1 show comparisons for various emission parameters with regulatory limits. Overall, the Metro Vancouver Waste-to-Energy Facility operates well within environmental standards.

Table 1: 2022 Emissions Summary Table

Parameter (Average Values)	Units	Regulatory Levels	2022 Emissions Data	Percentage of Limit
Manual Stack Tests:				
Particulate Matter	mg/dscm	9	1.5	17%
Hydrogen Fluoride (HF)	mg/dscm	1	0.01	1%
Sum of Lead, Arsenic, and Chromium	ug/dscm	64.0	6.7	10%
Cadmium (Cd)	ug/dscm	7.0	0.6	9%
Mercury (Hg)	ug/dscm	20.0	0.1	0.5%
Trace Organics Tests:				
Dioxins/Furans (PCDD/PCDF)	ng/dscm	0.08	ND	-
Chlorophenols	ug/dscm	1	0.006	0.6%
Chlorobenzenes	ug/dscm	1	0.22	22%
Polycyclic Aromatic Hydrocarbons (PAHs)	ug/dscm	5	0.17	3%
Polychlorinated Biphenyls (PCBs)	ug/dscm	1	0.017	2%
Continuous Emissions Monitoring System:				
Nitrogen Oxides (NOx)		190	125	66%
Carbon Monoxide (CO)		50	24	48%
Sulphur Dioxide (SO_2)		200	64	32%

Operational Certificate Implementation and Ambient Air Monitoring

On December 3, 2020, the Metro Vancouver Waste-to-Energy Facility Operational Certificate was amended to defer the reduction in discharge limits for hydrogen chloride and sulphur dioxide from December 31, 2022 to March 3, 2025. Dispersion modelling submitted to the Ministry of Environment and Climate Change Strategy in December 2018 indicated that with current emission and operational certificate permitted levels, maximum ambient air concentrations of hydrogen chloride and sulphur dioxide are not expected to exceed ambient air criteria. The extension allowed for additional ambient air monitoring to confirm concentration levels.

In the fall of 2020 Metro Vancouver installed an air quality monitoring station in the northwest corner of the Waste-to-Energy Facility site, which is near the location with the highest expected concentrations identified by the dispersion modelling. The station continuously measures hydrogen chloride, sulphur dioxide and nitrogen dioxide.

Metro Vancouver's existing Burnaby South air quality monitoring station was put in place in advance of the development of the Waste-to-Energy Facility with the goal of monitoring for any potential impacts of the Waste-to-Energy Facility on air quality. The instrumentation at the station, which already included sulphur dioxide and nitrogen dioxide monitoring, was upgraded in the fall of 2020 with the addition of a hydrogen chloride monitor.

In 2022, Metro Vancouver installed a meteorological station on the roof of the Waste-to-Energy Facility to provide more information on local meteorological conditions and allow comparison of measured ambient air quality concentrations to operations at the Waste-to-Energy Facility.

Metro Vancouver has engaged a consultant to evaluate the data for reporting to the Ministry of Environment and Climate Change Strategy. Hydrogen chloride, sulphur dioxide, and nitrogen dioxide data collected from both monitoring stations has been posted monthly on the Metro Vancouver website since December 2020. Within the 2-year monitoring period, no exceedances of short-term nor long-term (1-hour, 24-hour, and annual) ambient air quality objectives for nitrogen dioxide, sulphur dioxide and hydrogen chloride were recorded at either monitoring station.

Data collected to date (Attachment 2) shows 1-hour maximum ambient air concentrations of hydrogen chloride were 6% of the ambient air quality objectives at the Waste-to-Energy monitoring station, and 9% of the ambient objectives at the Burnaby South monitoring station. 98% of the time, ambient concentrations of hydrogen chloride are less than 3% of the ambient air quality objectives at both stations. A diurnal pattern in hydrogen chloride has been noted during the summer months.

1-hour maximum ambient air concentrations of sulphur dioxide were 10% of ambient air quality objectives at the Waste-to-Energy monitoring station, and 6% of the ambient objectives at the Burnaby South Station. 98% of the time, ambient concentrations of sulphur dioxide are less than 2% of the ambient air quality objectives at both stations. Peak 1-hour average SO2 concentrations occurred midday on all days of the week, whereas operations at the Waste-to-Energy Facility are continuous.

Nitrogen dioxide levels were 76% and 62% of the 1-hour ambient air quality objective at the Waste-to-Energy Facility monitoring station and the Burnaby South station respectively, and lower than many other monitoring stations in the region, such as the Vancouver Airport and Vancouver Clarke Drive. The primary contributor to ambient nitrogen dioxide throughout the region is automobile exhaust, with peak readings at both monitoring stations occurring during peak traffic conditions. 95% of the time, ambient concentrations of nitrogen dioxide are 50% or less of the ambient air quality objectives at both stations.

Linear regression analysis determined that there was no statistically significant linear correlation between the Waste-to-Energy Facility continuous emissions monitoring system data and ambient air quality data for all three pollutants. This suggests other regional emission sources are the primary drivers of the ambient levels of nitrogen dioxide, sulphur dioxide and hydrogen chloride recorded at both the Waste-to-Energy Facility station and the Burnaby South station.

Metro Vancouver is working on a draft request to amend the Operational Certificate to reflect the results of the monitoring program analysis that shows observed ambient sulphur dioxide and hydrogen chloride concentrations are well below ambient objectives and suggests that observed ambient concentrations are primarily due to other regional emission sources and meteorological factors.

Greenhouse Gas Emissions Reporting

In mid-2009 the federal and provincial governments each enacted legislation requiring reporting of greenhouse gas emissions for facilities with annual emissions above specified thresholds of 50,000 tonnes (federal) and 10,000 (provincial) tonnes of carbon dioxide equivalent per year. Based on these thresholds, the Waste-to-Energy Facility is subject to federal and provincial reporting on both biogenic (renewable) and anthropogenic (man-made or non-renewable) greenhouse gas emissions.

Greenhouse gas emissions from the Waste-to-Energy Facility are comprised mainly of carbon dioxide with trace amounts of methane and nitrous oxides. The 2022 greenhouse gas emissions were verified by a third party consultant and reported to the provincial and federal governments. Non-biogenic emissions from the facility were 113,352 tonnes carbon dioxide equivalents, a 16% decrease from 2021. This decrease is primarily due to annual fluctuations in waste composition. Over the past five years, the non-biogenic portion of greenhouse gas emissions has ranged from 40% to 48%. In 2022 it was 40%.

Overall greenhouse gas emissions from the facility in 2022, including both non-biogenic and biogenic, were 285,747 tonnes carbon dioxide equivalents, a decrease of approximately 8% compared to 2021. This decrease is primarily due to decreased waste throughput at the Waste-to-Energy Facility as a result of ongoing capital upgrades. As in past reporting years, the Waste-to-Energy Facility accounted for less than 1% of all anthropogenic greenhouse gas emissions in the region.

National Pollutant Release Inventory Reporting

The National Pollutant Release Inventory is Canada's legislated, publicly accessible inventory of pollutant releases to air, water, and land, as well as from disposal and transfer for recycling. The National Pollutant Release Inventory is managed by Environment and Climate Change Canada and currently tracks over 300 substances and groups of substances. Metro Vancouver is required to report air emissions (e.g., particulate matter, metals, organic compounds, and acid gases) and substances transported for off-site disposal, including fly ash and bottom ash for the preceding calendar year, to the National Pollutant Release Inventory. Table 2 summarizes the information which has been reported to the National Pollutant Release Inventory.

Table 2: 2022 National Pollutant Release Inventory Substance Reporting Summary

	Reported Quantity (tonnes)	
Substance	**Stack Emissions**	**Ash Disposal**
Nitrogen Oxides	222	N/A
Carbon Monoxide	46	N/A
Sulphur Dioxide	113	N/A
Hydrogen Chloride/Hydrochloric Acid	75.8	N/A
Aluminum (dust)	0.022	N/A
Arsenic	0.00077	1.34
Cadmium	0.00036	1.38
Cobalt	0.0002	2.2
Copper	0.0024	85.2
Lead	0.004	23.0
Manganese	0.0014	28.0
Mercury	0.00007	0.049
Phosphorus	0.0037	587.9
Zinc	0.027	202.7
Particulate Matter ≤ 10µm	1.81	N/A
Particulate Matter ≤ 2.5µm	1.45	N/A
Dioxins and Furans	N/A	N/A
Hexachlorobenzene	N/A	N/A

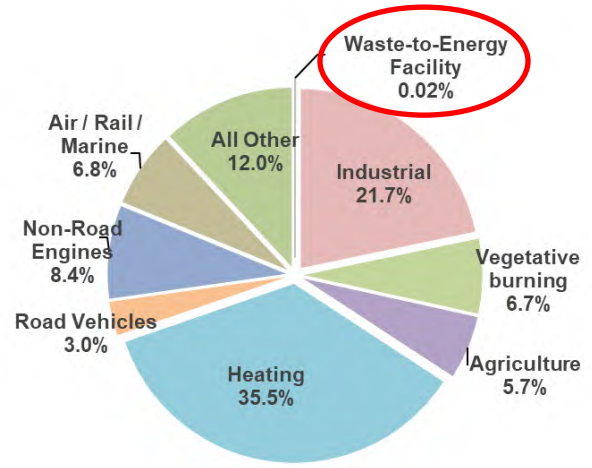
Notes: - All other substances are below the National Pollutant Release Inventory level of quantification and are not required to be reported.
- 'N/A' indicates value is either below the level of quantification, below the detection limit, or the substance is not found in ash.

Waste-to-Energy Facility in a Regional Context

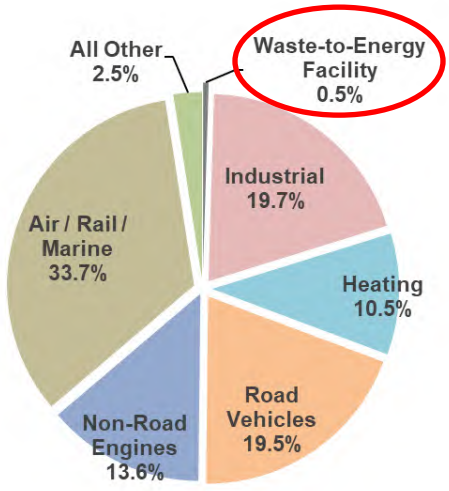
Figure 1 compares Waste-to-Energy Facility emissions to total emissions from all regional sources for two key air contaminants in the Lower Fraser Valley – fine particulate matter and nitrogen oxides (a key smog forming pollutant). In 2022, the Waste-to-Energy Facility accounted for 0.02% of regional fine particulate matter emissions and 0.5% of regional nitrogen oxide emissions. The Nitrogen Oxide Reduction Project, completed in October 2014, reduced nitrogen oxide emissions from 0.9% of the regional total in 2013 to 0.5% in 2022.

Figure 1: Regional Emissions Distribution (2022) – Fine Particulate Matter and Nitrogen Oxides

2022 Lower Fraser Valley Fine Particulate Matter Emission Sources



2022 Lower Fraser Valley Nitrogen Oxide Emission Sources



Comparison to Previous Year

Environmental performance data from 1988 to 2022 is included in Attachment 1. Environmental performance for the Waste-to-Energy Facility for 2022 was similar to 2021. Fine particulates and metals emissions showed some variability between the two years, but all continue to be well within regulatory limits.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Activities related to emissions monitoring and reporting are included in the approved Solid Waste Services operational budget.

CONCLUSION

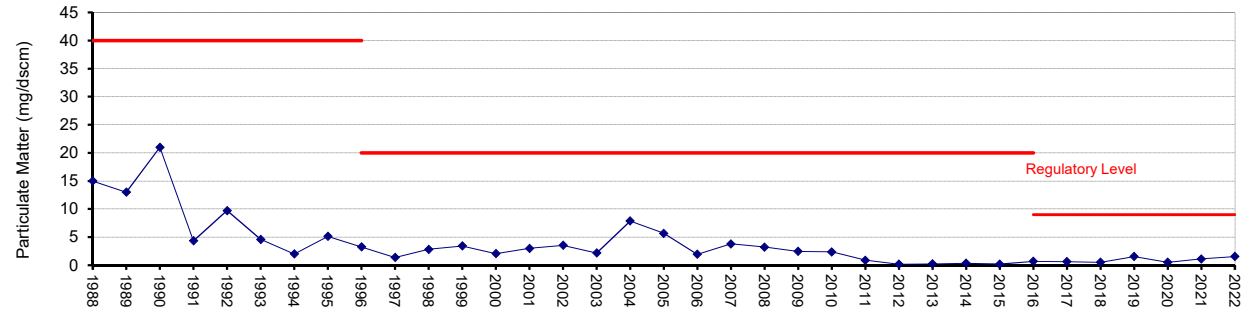
The Waste-to-Energy Facility operates well within environmental standards and regulatory limits. A range of projects that continuously improve the facility's environmental performance have been completed or are underway. All air emission related parameters monitored during 2022 were in compliance with Operational Certificate 107051. Continuous emissions monitoring data and all compliance reports are available on the Metro Vancouver website. Ambient air monitoring at the Waste-to-Energy Facility and the nearby Burnaby South monitoring station show low levels of hydrogen chloride, sulfur dioxide and nitrogen dioxide, with analysis showing other emission sources as the primary drivers of the observed ambient concentrations for these parameters.

Attachments

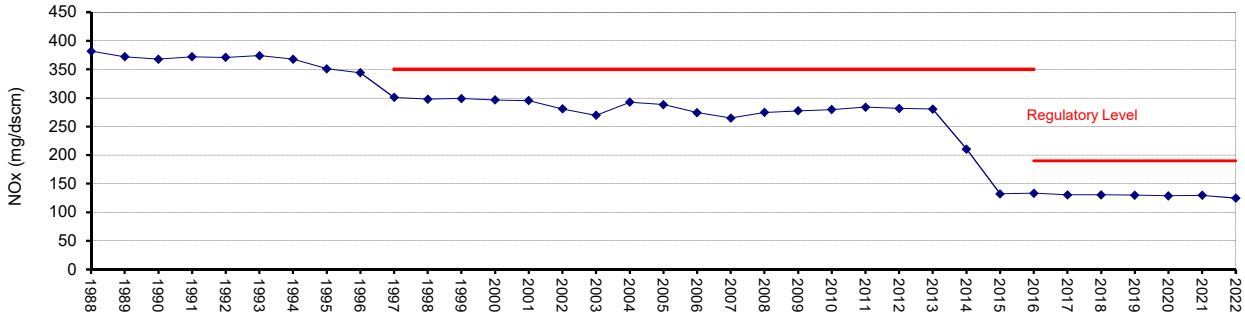
1. Metro Vancouver Waste-to-Energy Facility Summary of Air Emissions 1988-2022
2. Metro Vancouver Waste-to-Energy Facility 2022 Ambient Air Quality Report

Metro Vancouver Waste-To-Energy Facility Summary of Air Emissions 1988 - 2022

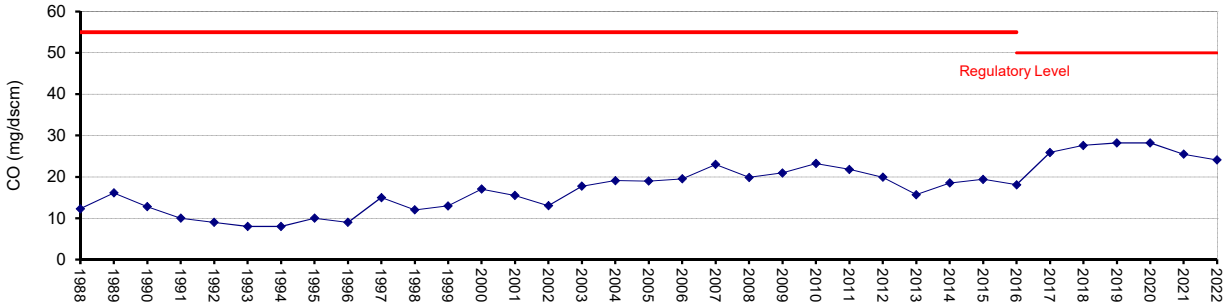
Particulate Matter



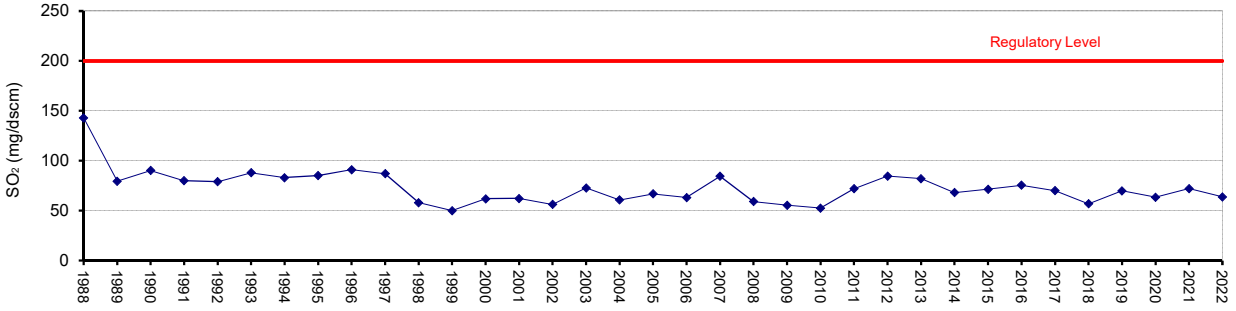
Nitrogen Oxides



Carbon Monoxide

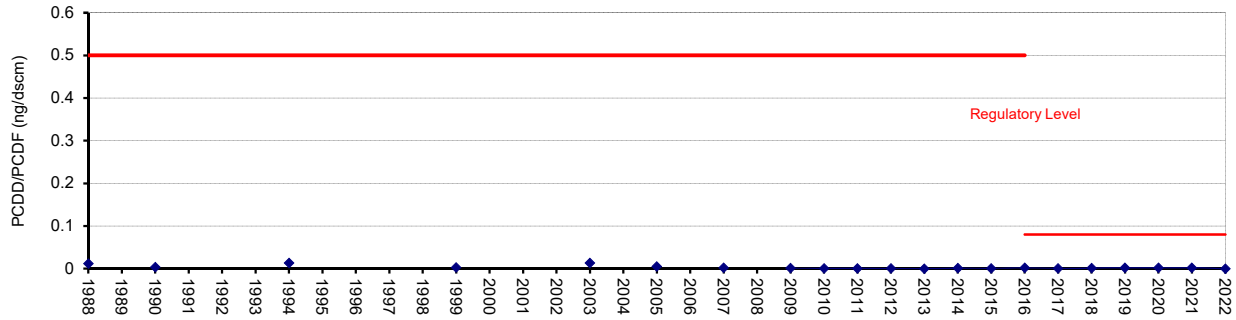


Sulfur Dioxide

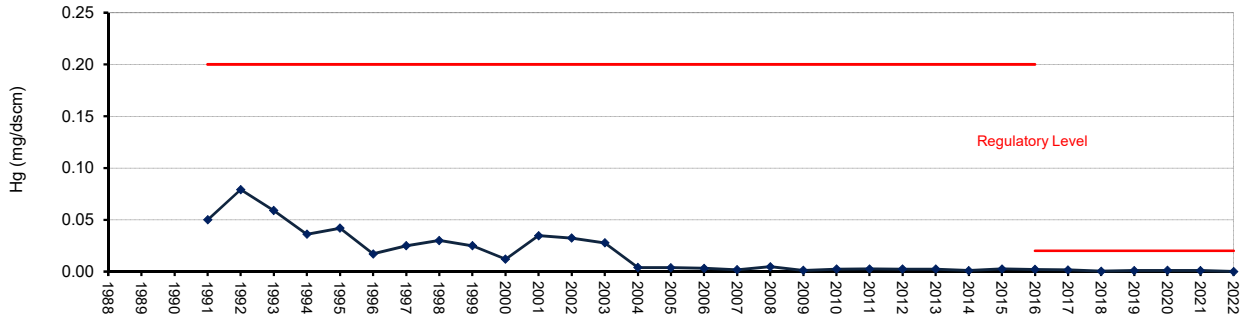


Metro Vancouver Waste-To-Energy Facility Summary of Air Emissions 1988 - 2022

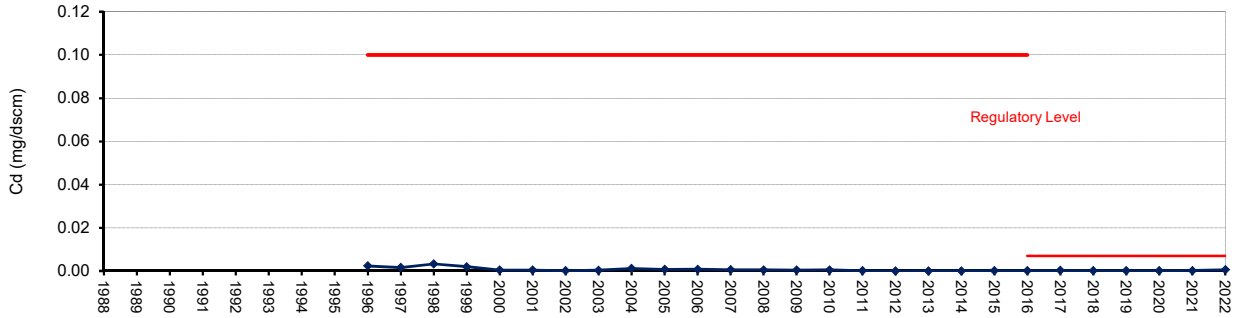
Dioxins/Furans



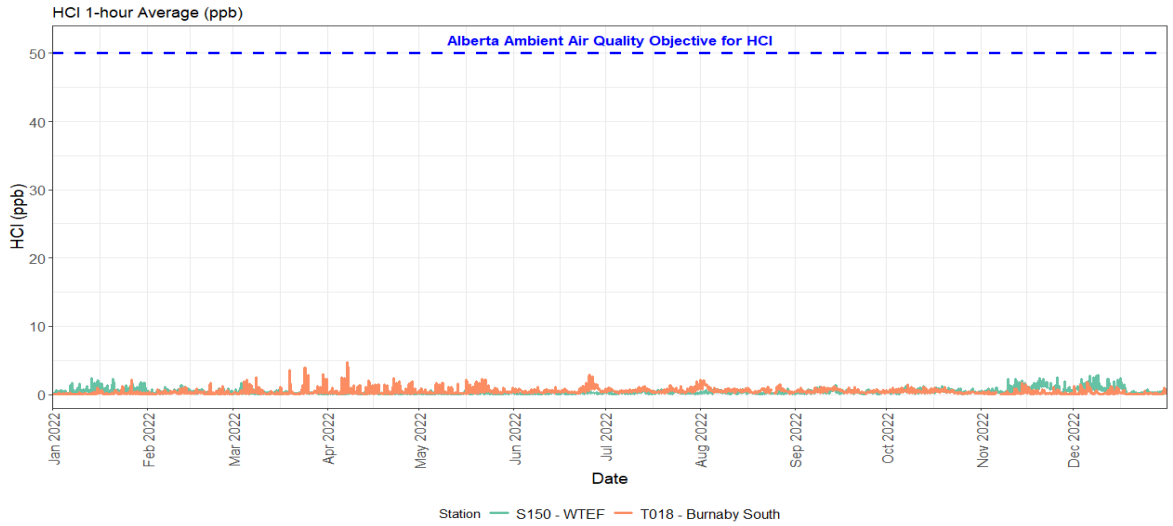
Mercury

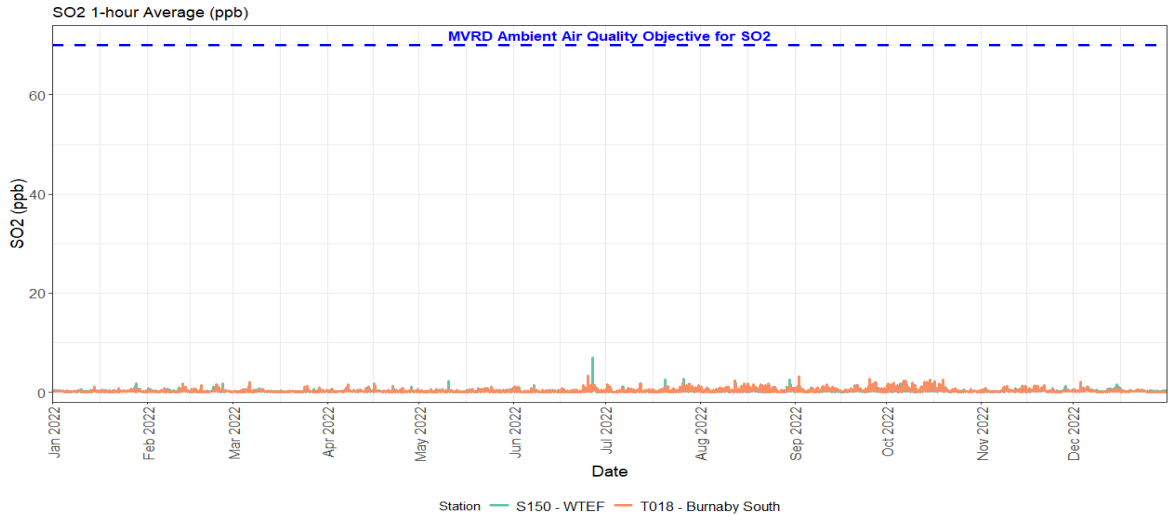


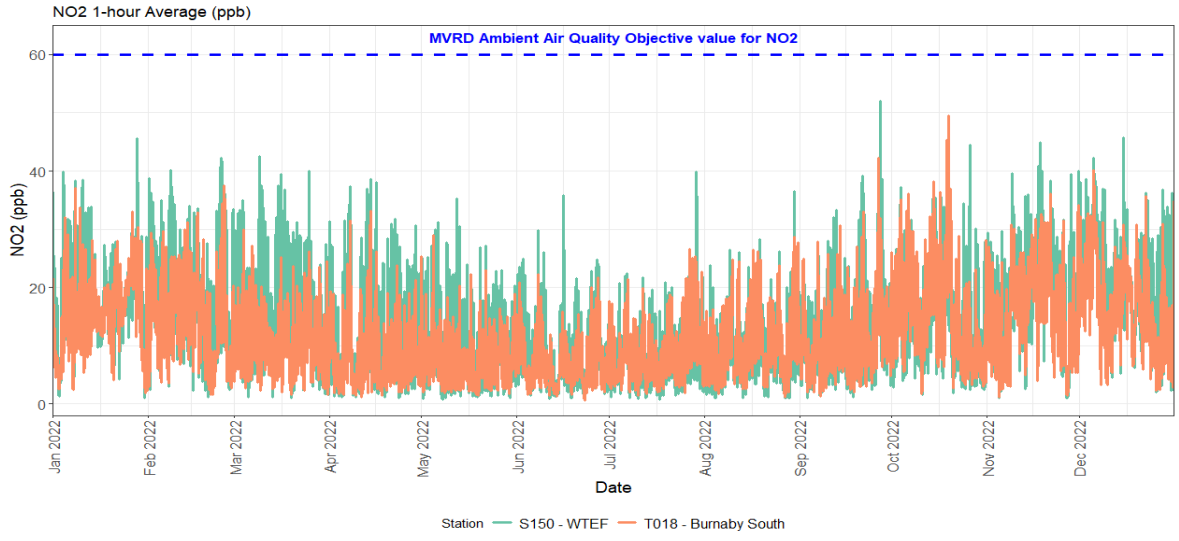
Cadmium



Metro Vancouver Waste-to-Energy Facility 2022 Ambient Air Quality Report







To: Zero Waste Committee

From: Lynne Vidler, Lead Senior Engineer, Solid Waste Services

Date: September 5, 2023 Meeting Date: September 14, 2023

Subject: **Solid Waste Services Capital Program Expenditure Update as of June 30, 2023**

RECOMMENDATION

That the Zero Waste Committee receive for information the report dated September 5, 2023, titled "Solid Waste Services Capital Program Expenditure Update as of June 30, 2023".

EXECUTIVE SUMMARY

The capital expenditure reporting process, as approved by the GVS&DD Board (the Board), provides for regular status reports on capital expenditures four times per year. In previous years, these reports were provided three times per year. This is the second report for 2023 which includes both the overall capital program for the solid waste utility with a multi-year view of capital projects, and the actual capital spending for the 2023 fiscal year to June 30, 2023 compared to the annual Capital Cash Flow. As of June 30, 2023, the capital expenditures for Solid Waste Services are $2.1 million compared to a prorated annual Capital Cash Flow of $21.4 million. The underspend is primarily due to the timing of the pre-construction phases of Waste-to-Energy Facility projects and recycling and waste center projects. Projects underway are expected to the completed within approved budgets.

PURPOSE

The purpose of this report is to provide an update on the status of the Solid Waste Services capital program and financial performance to June 30, 2023.

BACKGROUND

The capital expenditure reporting process, as approved by the Board, provides for regular status reports on capital expenditures with interim reports sent to the Water, Liquid Waste, and Zero Waste Committees, in July, September, November, with a final year-end report to the Committees and the Boards in April of each year. In previous years these reports were provided three times per year (July, November and April).

The series of four reports for 2023 look at both the overall capital program for Solid Waste Services with a multi-year view of capital projects and the actual capital spending for the 2023 fiscal year to June 30, 2023 compared to the annual Capital Cash Flow.

2023 CAPITAL EXPENDITURES

Solid Waste Capital Program Funding

The capital spending for Solid Waste Services is funded through the Solid Waste Services operating budget by a combination of contribution to capital (pay-as-you-go funding) and debt service costs (principal and interest payments) which are generated from the regional ratepayers through tipping

fees. As a result, the annual impact on the ratepayers is less than the level of budgeted capital expenditures.

Overall Capital Program

The overall capital program for Solid Waste Services includes capital projects that require multiple years to complete. These projects are broken down into various phases such as project definition, pre-design, detailed design, and construction. The status at the completion of each phase informs appropriate costing of subsequent phases.

Expected capital costs for a number of projects were updated as part of the 2023-2027 capital plan to reflect the most current projections for these projects. With the rare exception, projects tend to complete with actual spending below the approved limits predominately due to savings on budgeted contingency amounts.

Attachment 1 provides detail behind the summary information, including specific capital projects, summary financial information. Attachment 2 provides additional project status information of some of the key projects.

2023 Capital Program Summary

The Metro Vancouver financial planning process includes Board approval of both an annual Operating Budget (operations, contribution to capital and debt service) and an annual Capital Cash Flow for the planned capital infrastructure projects. The annual Capital Cash Flow comprises the projected spending for a list of capital projects either continuing or to be started within the calendar year.

As of June 30, 2023, the capital expenditures for Solid Waste Services are $2.1 million compared to a prorated budget of $21.4 million. The underspend is primarily due to longer than expected pre-construction phases for a number of Waste-to-Energy Facility projects and recycling and waste center projects. The pre-construction phases include detailed design and third party engineering reviews.

Table 1 provides a summary of the 2023 actual spending to June 30, 2023 compared to the prorated annual Capital Cash Flow.

Table 1 – June 30 2023 Capital Spending Summary

Solid Waste Services	2023 Cash Flow to June 30, 2023	Actual Expenditures to June 30, 2023	% of 2023 Prorated Cash Flow
Landfills	$ 3,075,000	$ 734,805	24%
Recycling and Waste Centers	6,050,000	(362,733)	-6%
Waste to Energy Facilities	12,300,000	1,751,417	14%
Total	**$ 21,425,000**	**$ 2,123,489**	**10%**

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Capital expenditures are funded internally (pay-as-you-go) and through debt financing. As capital expenditures are incurred, short-term financing is secured and converted twice per year to long-term debt through the Municipal Finance Authority.

CONCLUSION

As of June 30, 2023, the capital expenditures for Solid Waste Services are $2.1 million compared to a prorated annual Capital Cash Flow of $21.4 million. The underspend is primarily due to the timing of the pre-construction phases of the Waste-to-Energy Facility and recycling and waste center projects. Ongoing capital projects will be monitored to ensure they remain within the total project budgets.

Attachments

1. Solid Waste Services Capital Project Update – June 30, 2023
2. Solid Waste Services Capital Projects Status Information

61179616

Metro Vancouver

Solid Waste Services - Capital Project Update

As of June 30, 2023

ATTACHMENT 1

Project Name	Primary Driver	Project Location	Years	Approved Capital Budget	Current Estimated Total Project Cost	% Complete
			2023-2027 Capital Plan			
			2023 2024 2025 2026 2027 2028 2029 2030 2031 2032			
Landfills						
Alternative Fuel and Recyclables Recovery Centre	Opportunity	Coquitlam		-	60,000,000	0%
Coquitlam Landfill East Closure	Resilience	Coquitlam		5,000,000	5,000,000	1%
Coquitlam Landfill Gas Collection Upgrades	Maintenance	Coquitlam		8,100,000	8,100,000	82%
Coquitlam Landfill Lot 3 Development	Resilience	Coquitlam		5,000,000	5,000,000	95%
Coquitlam Landfill Pump Station Upgrade	Maintenance	Coquitlam		3,400,000	3,400,000	50%
Coquitlam Landfill: Leachate Collection System Grade Realignment	Resilience	Coquitlam		1,000,000	1,000,000	0%
Total Landfills				**22,500,000**	**82,500,000**	
Recycling and Waste Centres						
Central Surrey Recycling and Waste Centre	Growth	Surrey		50,300,000	50,300,000	99%
Langley Recycling Depot Development	Upgrade	Langley Township		5,500,000	15,000,000	0%
Maple Ridge Recycling and Waste Centre Upgrades	Maintenance	Maple Ridge		2,000,000	2,000,000	0%
North Shore Recycling and Waste Centre Compactor Replacement	Maintenance	North Vancouver		-	4,000,000	0%
North Surrey Recycling and Waste Centre Compactor Replacement	Maintenance	Surrey		3,000,000	3,000,000	0%
North Surrey Recycling Depot Development	Upgrade	Surrey		29,500,000	35,590,000	1%
Weigh Scale Replacement	Maintenance	Regional		3,000,000	3,500,000	0%
Total Pump Stations				**93,300,000**	**113,390,000**	
Waste-to-Energy Facility						
Acid Gas Reduction	Upgrade	Burnaby		2,000,000	50,250,000	1%
Air System Piping Replacement	Maintenance	Burnaby		300,000	300,000	0%
Biosolids Processing	Resilience	Burnaby		22,500,000	23,850,000	2%
Boiler and APC Roof Replacement	Maintenance	Burnaby		1,750,000	3,000,000	0%
Bottom Ash Crane Replacement	Maintenance	Burnaby		1,400,000	1,400,000	5%
Bottom Ash Processing	Opportunity	Burnaby		6,800,000	6,800,000	95%
Carbon Silo Replacement	Maintenance	Burnaby		-	2,400,000	0%
Compressed Air System Replacement	Maintenance	Burnaby		3,000,000	3,000,000	3%
Electrical Transformers Replacement	Maintenance	Burnaby		5,000,000	5,000,000	1%
Fabric Filter Hopper and Pulse Header Refurbishment	Maintenance	Burnaby		2,150,000	2,150,000	6%
Feed Hopper/Chute	Maintenance	Burnaby		2,600,000	2,600,000	90%
Feedwater Pump Replacement	Maintenance	Burnaby		1,000,000	1,000,000	60%
Fire Suppression System	Maintenance	Burnaby		1,400,000	1,400,000	1%
Fly Ash Silo Refurbishment	Maintenance	Burnaby		1,000,000	1,500,000	0%
Generation Bank Replacement	Maintenance	Burnaby		9,000,000	12,000,000	0%
Lime Silo Replacement	Maintenance			-	3,600,000	0%
Primary Economizer Replacement	Maintenance	Burnaby		7,000,000	7,000,000	35%
Primary Superheaters Replacement	Maintenance	Burnaby		4,000,000	4,000,000	0%
Programmable Logic Controllers Replacement	Maintenance	Burnaby		2,000,000	2,000,000	1%
Pug Mill Enclosure Ventilation System Replacement	Maintenance	Burnaby		1,000,000	1,500,000	0%
Refuse Crane	Maintenance	Burnaby		16,800,000	17,850,000	1%
Refuse Pit Bunker Door Replacement	Maintenance	Burnaby		600,000	1,000,000	0%
Secondary Economizers Replacement	Maintenance	Burnaby		6,000,000	6,000,000	0%
Soot Blower Piping Replacement	Maintenance	Burnaby		300,000	300,000	0%
Special Handle Waste Direct Feed System	Opportunity	Burnaby		-	10,000,000	0%
Stack Refurbishment	Maintenance	Burnaby		350,000	600,000	0%
District Energy	Opportunity	Burnaby		55,000,000	75,300,000	2%
District Energy Opportunities	Opportunity	Burnaby		2,300,000	2,300,000	54%
Total Waste-to-Energy Facility				**155,250,000**	**248,100,000**	
Grand Total Solid Waste Services				**271,050,000**	**443,990,000**	

	66,300,000	134,700,000	0% (not Star
	200,750,000	309,290,000	On-going
	-	-	100% (comp
Total	267,050,000	443,990,000	

ATTACHMENT 2

Solid Waste Services Capital Project Status Information

June 30, 2023

Current major capital projects are expected to be completed within budget; however, Waste-to-Energy Facility projects are proceeding slower than expected and have resulted in reduced expenditures in 2023 compared to projected cash flows.

Recycling and Waste Centre Program

- Upgrades to the North Surrey and Langley Recycling and Waste Centres are in the planning stage. Enhanced recycling will be implemented at both of these facilities to provide free recycling drop off services ahead of the weight scales. Planning and design for these enhancements have started.
- The North Surrey compactor replacement project has been initiated and is expected to be completed in 2024.

Landfills Program

- A landfill gas collection system upgrade is required, including a new control room at the blower flare station. Detailed design is currently in the procurement process.
- In the leachate collection system, the upgraded west pump station is operational and procurement for the design of the east pump station is underway with assistance from Liquid Waste Services.
- The leachate collection system realignment/upgrade is expected to begin in 2023 after procurement and award of a new 5-year comprehensive environmental consulting services contract.
- The eastern lot at the Coquitlam Landfill (Lot #3) is currently undeveloped. Planning and design work has begun for the preparation of this site to receive final closure and prepare grades for future development. Initial work to ensure good site drainage is complete. The end use for the approximately 3-hectare site has yet to be determined, but will be used to expand the region's waste reduction and recycling services. In the interim a portion of the property is being used for temporary storage of houses being moved to new locations in an effort to save them from demolition.

Waste-to-Energy Program

- The Waste-to-Energy Facility district energy project is currently in the planning and design stage. The initial phase of this project will be constructed in 2024-2025 and consist of an energy centre constructed at the existing Waste-to-Energy Facility and an approximately 6 km long thermal energy transmission line to connect to the River District development project in south-east Vancouver. Multiple phases are anticipated for this project with connections to other development centres surrounding the Waste-to-Energy Facility.

- The refuse crane replacement project commenced with preliminary engineering in 2019. The next phases of the project include detailed design and procurement of the major capital items.
- Covanta commenced replacement of the back-up feedwater pumps as they have reached the end of their useful life.
- The feed hopper / chute replacement project started in late 2019. The feed hopper and feed chute replacement is now substantially complete.
- Ministry of Environment and Climate Change Strategy has approved proceeding with managing up to 25,000 tonnes per year of biosolids at the Waste-to-Energy Facility. The project is now in detailed design.
- The primary economizer project commenced with engineering and procurement services on November 6, 2020. Installation of the works will be completed during the fall 2023 outages.
- The compressed air system replacement project is underway, an engineering study which commenced on October 18, 2021 and is complete. The next phase of the project will include detailed design and procurement of the major capital items.
- The fabric filter / pulse header refurbishment project is underway, an engineering study commenced on December 2, 2021 and is complete. The next phase of the project will include detailed design and procurement of the major capital items.
- The fire detection system replacement project is underway, the upgrade is expected to be completed in 2024.
- The programmable logic controllers replacement project is underway, the upgrade is expected to be completed in 2024.
- The electrical transformer replacement project is underway, an engineering study which commenced on October 19, 2022 will be completed in 2023.