metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

METRO VANCOUVER REGIONAL DISTRICT
LIQUID WASTE COMMITTEE

REGULAR MEETING

May 18, 2022
1:00 p.m.
Meeting conducted electronically and in-person pursuant to the Procedure Bylaw
28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia
Webstream available at http://www.metrovancouver.org

A G E N D A[1]

1. ADOPTION OF THE AGENDA

1.1 May 18, 2022 Regular Meeting Agenda
That the Liquid Waste Committee adopt the agenda for its regular meeting scheduled for May 18, 2022 as circulated.

2. ADOPTION OF THE MINUTES

2.1 April 13, 2022 Regular Meeting Minutes *pg 4*
That the Liquid Waste Committee adopt the minutes of its regular meeting held April 13, 2022 as circulated.

3. DELEGATIONS

4. INVITED PRESENTATIONS

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Video: Sewer Inspection New Technologies - Free Swimming Device

5.2 State of the Assets Report - Liquid Waste *pg 11*
That the GVS&DD Board receive for information the report dated May 3, 2022, titled "State of the Assets Report - Liquid Waste".

5.3 Environmental Risk Management Policy for Liquid Waste Services *pg 54*
That the GVS&DD Board approve the *Environmental Risk Management Policy for Liquid Waste Services*, as presented in the report dated April 29, 2022, titled "Environmental Risk Management Policy for Liquid Waste Services".

[1] *Note: Recommendation is shown under each item, where applicable.*

5.4 Grant Funding Application for Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project *pg 61*

That the GVS&DD Board:

a) support the application for grant funding of $13,400,000 for the Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project to CleanBC Communities Fund, as presented in the report titled "Grant Funding Application for Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project", dated May 4, 2022; and

b) subject to successful grant funding, approve financing of eligible costs until the provincial government contributions are received, and approve funding for any ineligible and potential Project cost overruns.

5.5 Award of Contract Resulting from Request for Proposal No. 22-015: Supply and Delivery of Sodium Hypochlorite *pg 64*

That the GVWD and GVS&DD Boards:

a) approve award of a contract for an estimated value of $11,992,000 (exclusive of taxes) to Brenntag Canada Inc., for an initial 3-year term, resulting from Request for Proposal No. 22-015: Supply and Delivery of Sodium Hypochlorite, subject to final review by the Commissioner; and

b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

5.6 Manager's Report *pg 67*

That the Liquid Waste Committee receive for information the report dated May 10, 2022 titled "Manager's Report".

6. INFORMATION ITEMS

6.1 2022 Update on Liquid Waste Sustainability Innovation Fund Projects *pg 73*

This report is being presented to the Climate Action Committee at its May 13, 2022 meeting and is presented to the Liquid Waste Committee for its information only.

7. OTHER BUSINESS

8. BUSINESS ARISING FROM DELEGATIONS

9. RESOLUTION TO CLOSE MEETING

Note: The Committee must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

10. ADJOURNMENT/CONCLUSION

That the Liquid Waste Committee adjourn/conclude its regular meeting of May 18, 2022.

Membership:

Stewart, Richard (C) - Coquitlam
Dominato, Lisa (VC) - Vancouver
Calendino, Pietro - Burnaby
Elford, Doug - City of Surrey
Ferguson, Steve - Langley Township
Little, Mike - North Vancouver District
Loo, Alexa - Richmond
McDonald, Bruce - Delta
McEwen, John - Anmore
Trentadue, Mary - New Westminster
Walker, Darryl - White Rock

METRO VANCOUVER REGIONAL DISTRICT
LIQUID WASTE COMMITTEE

Minutes of the Regular Meeting of the Metro Vancouver Regional District (MVRD) Liquid Waste Committee held at 1:03 p.m. on Wednesday, April 13, 2022 in the 28th Floor Boardroom, 4515 Central Boulevard, Burnaby, British Columbia.

MEMBERS PRESENT:
Chair, Mayor Richard Stewart, Coquitlam
Councillor Pietro Calendino*, Burnaby
Councillor Doug Elford*, Surrey
Councillor Steve Ferguson, Langley Township
Mayor Mike Little*, North Vancouver District
Councillor Alexa Loo*, Richmond
Councillor Bruce McDonald*, Delta
Mayor John McEwen*, Anmore
Councillor Mary Trentadue*, New Westminster
Mayor Darryl Walker*, White Rock

MEMBERS ABSENT:
Vice Chair, Councillor Lisa Dominato, Vancouver

STAFF PRESENT:
Peter Navratil, General Manager, Liquid Waste Services
Amelia White, Legislative Services Supervisor, Board and Information Services

1. ADOPTION OF THE AGENDA

1.1 April 13, 2022 Regular Meeting Agenda

It was MOVED and SECONDED
That the Liquid Waste Committee adopt the agenda for its regular meeting scheduled for April 13, 2022 as circulated.

CARRIED

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

2. ADOPTION OF THE MINUTES

2.1 March 9, 2022 Regular Meeting Minutes

It was MOVED and SECONDED
That the Liquid Waste Committee adopt the minutes of its regular meeting held March 9, 2022 as circulated.

CARRIED

3. DELEGATIONS

No items presented.

4. INVITED PRESENTATIONS

No items presented.

5. REPORTS FROM COMMITTEE OR STAFF

5.1 Appointment of Sewage Control Manager and Enforcement Officers

Report dated March 15, 2022, from Grant McGillivray, Environmental Control Officer, Environmental Regulation and Enforcement, Parks and Environment, seeking the GVS&DD Board's approval to appoint and rescind appointments of Metro Vancouver and City of Vancouver employees as Board-designated sewerage control managers and officers.

It was MOVED and SECONDED
That the GVS&DD Board:

a) pursuant to the *Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw* and the *Environmental Management Act:*
   i. rescind the appointments of former Metro Vancouver employee Ray Robb as a sewage control manager, and of Metro Vancouver employee Kathy Preston as a deputy sewage control manager;
   ii. appoint Metro Vancouver employee Kathy Preston as a sewage control manager;
   iii. rescind the appointments of former Metro Vancouver employees Toby Gritten, and Dan Saunders, and former City of Vancouver employee Ze Chen Liu as officers; and
   iv. appoint Metro Vancouver employee Muhammad Ali as an officer.

b) pursuant to Section 28 of the *Offence Act* for the purpose of serving summons for alleged violations under the *Greater Vancouver Sewerage and Drainage District Sewer Use Bylaw:*
   i. rescind the appointments of former Metro Vancouver employees Toby Gritten, and Dan Saunders, and former City of Vancouver employee Ze Chen Liu; and
   ii. appoint Metro Vancouver employee Muhammad Ali.

CARRIED

5.2 Regional Public Works Mutual Aid Agreement

Report dated March 11, 2022, from Peter Navratil, General Manager, Liquid Waste Services and Brant Arnold-Smith, Program Manager, Security and Emergency Management, Corporate Safety, providing the Liquid Waste Committee with a summary of the mutual support, aid and assistance to be provided by members to ensure that Public Works are maintained in the event of an emergency or other serious incident.

Members were provided with a presentation on the need for an update, the Agreement Principles, a summary of comments from the Advisory Committees and the next steps.

Presentation material titled "Regional Public Works Mutual Aid Agreement" is retained with the April 13, 2022 Liquid Waste Committee agenda.

It was MOVED and SECONDED

That the GVS&DD Board authorize the Board Chair and Chief Administrative Officer to sign the new Regional Public Works Mutual Aid Agreement.

CARRIED

5.3 Liquid Waste Capital Program Expenditures Update as at December 31, 2021

Report dated March 24, 2022, from Colin Meldrum, Director, Engineering, Design and Construction, Liquid Waste Services, providing the Liquid Waste Committee with a report on the status of the capital program and financial performance for the 2021 fiscal year to December 31, 2021.

Members were provided with a presentation on the Liquid Waste Capital Program Expenditures Update highlighting a summary of the report and various capital projects.

Presentation material titled "Liquid Waste Services Capital Program Expenditures Project Update as of December 31, 2021" is retained with the April 13, 2022 Liquid Waste Committee agenda. A video presentation on the Albert Street Trunk Sewer was shown and is not retained with the agenda.

It was MOVED and SECONDED

That the Liquid Waste Committee receive for information the report dated March 24, 2022, titled "Liquid Waste Services Capital Program Expenditure Update as at December 31, 2021".

CARRIED

5.4 Project Delivery Capital Portfolio Update

Report dated March 23, 2022, from Cheryl Nelms, General Manager, Project Delivery, providing the Liquid Waste Committee with an update on the progress of major capital projects being delivered by the Project Delivery Department.

Members were provided a presentation on projects being overseen by the Project Delivery Department.

Presentation material titled "Project Delivery Department: Liquid Waste Projects" is retained with the April 13, 2022 Liquid Waste Committee agenda.

It was MOVED and SECONDED
That the Liquid Waste Committee receive for information the report dated March 23, 2022 titled "Project Delivery Capital Portfolio Update".

CARRIED

5.5 North Shore Wastewater Treatment Plant Project Update

Report dated April 1, 2022, from Cheryl Nelms, General Manager, Project Delivery, providing the Liquid Waste Committee with information on the progress of the North Shore Wastewater Treatment Plant Project.

Members were provided with a presentation on the North Shore Wastewater Treatment Plant Project highlighting the updated contract model, the contract approach for the General Contractor and next steps.

Presentation material titled "North Shore Wastewater Treatment Plant Project Update" is retained with the April 13, 2022 Liquid Waste Committee.

It was MOVED and SECONDED
That the GVS&DD Board receive for information the report dated April 1, 2022, titled "North Shore Wastewater Treatment Plant Project Update".

CARRIED

5.6 Iona Island Wastewater Treatment Plant – Cost Sharing of Ferguson Road Upgrades

Report dated April 6, 2022, from Cheryl Nelms, General Manager, Project Delivery, providing the Liquid Waste Committee with information about Metro Vancouver's negotiations with Vancouver Airport Authority for the cost of Ferguson Road upgrades in relation to the Iona Island Wastewater Treatment Plant Upgrade Projects and requesting that the GVS&DD Board authorize the Commissioner to execute a Road Corridor Construction and Cost Sharing Agreement with Vancouver Airport Authority.

Members were provided with a presentation on the Iona Island Wastewater Treatment Plant highlighting the delivery schedule, access and construction traffic volumes, the new alignment of Ferguson Road and the cost and schedule.

Discussion ensued regarding the division and design of the roadway and bike lanes and the elevation of the road in relation to sea level.

Presentation titled "Iona Island Wastewater Treatment Plant Projects: Cost Sharing of Ferguson Road Upgrades" is retained with the April 13, 2022 Liquid Waste Committee agenda.

It was MOVED and SECONDED
That the GVS&DD Board authorize the Commissioner to execute a Road Corridor Construction and Cost Sharing Agreement with Vancouver Airport Authority for upgrades to and realignment of Ferguson Road, as outlined in the report dated April 6, 2022, titled "Iona Island Wastewater Treatment Plant – Cost Sharing of Ferguson Road Upgrades".

CARRIED

5.7 Liquid Waste Management Plan Review and Update – Report on Phase 1

Report dated March 23, 2022, from Tom Sadleir, Program Manager, Community Engagement, External Relations and Brent Burton, Division Manager, Policy, Planning, providing the Liquid Waste Committee with the results of the first phase of engagement on the Liquid Waste Management Plan review and update and seeking authorization to begin the next phase of engagement to develop draft goals, strategies and actions for the updated plan.

It was MOVED and SECONDED
That the GVS&DD Board authorize staff to proceed with the next phase of the engagement process to update the Liquid Waste Management Plan, as outlined in the report dated March 23, 2022, titled "Liquid Waste Management Plan Review and Update – Report on Phase 1".

CARRIED

5.8 Greater Vancouver Sewerage and Drainage District Sewerage and Drainage Areas Boundaries Amending Bylaw No. 351, 2022 – Vancouver Sewerage Area and Fraser Sewerage Area Map Administrative Correction

Report dated March 23, 2022, from Mark Wellman, Senior Engineer, Policy, Planning and Analysis, Liquid Waste Services, seeking the GVS&DD Board's approval to amend the *Greater Vancouver Sewerage and Drainage District Sewerage and Drainage Areas Boundaries Bylaw No. 310, 2018* to reallocate a number of subject properties to either the Vancouver Sewerage Area (VSA) or the Fraser Sewerage Area (FSA) as appropriate.

It was MOVED and SECONDED
That the GVS&DD Board:

a) give first, second and third reading to the *Greater Vancouver Sewerage and Drainage District Sewerage and Drainage Areas Boundaries Amending Bylaw No. 351, 2022*; and
b) pass, and finally adopt the *Greater Vancouver Sewerage and Drainage District Sewerage and Drainage Areas Boundaries Amending Bylaw No. 351, 2022*.

CARRIED

5.9 Award of Contract Resulting from RFP No. 21-283: Program Management Consulting Services for the Iona Island Wastewater Treatment Plant Projects

Report dated April 1, 2022, from Cheryl Nelms, General Manager, Project Delivery and Roy Moulder, Director, Procurement, Procurement and Real Estate Services, advising the GVS&DD Board of the results of the Request for Proposal (RFP) No. 21-283: Program Management Consulting services for the Iona Island Wastewater Treatment Plant Program and recommending award of contract to Stantec Consulting Ltd. in an amount of up to $99,500,000 (exclusive of taxes) for five years.

It was MOVED and SECONDED

That the GVS&DD Board:

a) approve the award of contract resulting from Request for Proposal No. 21-283: Program Management Consulting Services for the Iona Island Wastewater Treatment Plant Projects to Stantec Consulting Ltd., in an amount of up to $99,500,000 (exclusive of taxes) over five years, subject to final review by the Commissioner; and

b) authorize the Commissioner and Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

CARRIED

5.10 Manager's Report

Report dated March 25, 2022, from Peter Navratil, General Manager, Liquid Waste Services, providing the Liquid Waste Committee with an update on the 2022 Regional Unflushables Campaign, the upcoming collaboration with health products stewardship association and the tour of the Iona Island Wastewater Treatment Plant and Iona Beach Regional Park.

It was MOVED and SECONDED

That the Liquid Waste Committee receive for information the report dated March 25, 2022 titled "Manager's Report".

CARRIED

6. INFORMATION ITEMS

No items presented.

7. OTHER BUSINESS

No items presented.

8. BUSINESS ARISING FROM DELEGATIONS

No items presented.

9. RESOLUTION TO CLOSE MEETING

It was MOVED and SECONDED

That the Liquid Waste Committee close its regular meeting scheduled for April 13, 2022 pursuant to the *Community Charter* provisions, Section 90 (1) (e) as follows:

"90 (1) A part of a board meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

(e) the acquisition, disposition or expropriation of land or improvements, if the board or committee considers that disclosure could reasonably be expected to harm the interests of the regional district."

CARRIED

10. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED

That the Liquid Waste Committee adjourn its regular meeting of April 13, 2022.

CARRIED

(Time: 2:21 p.m.)

_____ _____

Amelia White, Legislative Services Supervisor

Richard Stewart, Chair

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To: Liquid Waste Committee

From: Jennifer Crosby, Director of Project Management Office, Project Delivery
Rick Gallilee, Director of Support Services & Strategic Initiatives, Liquid Waste Services

Date: May 3, 2022 Meeting Date: May 18, 2022

Subject: **State of the Assets Report - Liquid Waste**

RECOMMENDATION

That the GVS&DD Board receive for information the report dated May 3, 2022, titled "State of the Assets Report - Liquid Waste".

EXECUTIVE SUMMARY

The *State of the Assets - Liquid Waste* report (Attachment) provides a summary of the asset inventory, condition, replacement value, and forecast long-term investment needs of the eight liquid waste asset classes. The overall condition has been assessed as "Good" for liquid waste assets. Current analysis indicates that the 2022–2026 Financial Plan contains sufficient funding to adequately maintain these existing assets. Key drivers going forward that are creating pressure on future budgets are growth, resilience, and regulatory changes which are not considered in this report and will be addressed separately.

Confidence in the accuracy and repeatability of the data used to generate the report ranges from uncertain (asset valuation) to reliable (asset inventory, asset condition). Continuous improvement of asset data, information technologies, and business practices is ongoing to better enable evidence based decision making and sustain targeted service levels.

PURPOSE

To present the *State of the Assets Report - Liquid Waste* as part of the ongoing implementation and continuous improvement of asset management practices for the utility, consistent with the approved *Asset Management Policy for Liquid Waste Services* (Reference).

BACKGROUND

At its September 28, 2018 meeting, the GVS&DD Board approved the *Asset Management for Liquid Waste Services Policy.* The policy formalized asset management principles related to maintaining existing assets and a framework to balance asset performance, risk, and cost to deliver liquid waste services. Metro Vancouver is continuing to develop its asset management program for liquid waste assets in alignment with this policy and international best practices. Publishing this state of the assets report is an important milestone in asset management for Metro Vancouver.

LIQUID WASTE STATE OF THE ASSETS

Metro Vancouver provides regional wastewater and regional drainage services to the GVS&DD member jurisdictions, serving 2.7 million residents in the Lower Mainland. This includes collecting

and treating wastewater and managing defined regional drainage systems through a complex system of natural and built assets. These assets are divided into eight asset classes.

Condition and Replacement Value

The *Asset Management for Liquid Waste Services Policy* defines asset performance categories and targets as an indicator of an assets' likelihood of failure. One of the performance categories is asset condition. For all assets, a 1 to 5 (very good to very poor) condition scoring system is used. The minimum condition threshold for all assets is condition grade 4 (poor) or better and grade 3 (fair) or better for high criticality assets. Where inspection-based condition information is not available, asset age is used to infer condition. Overall condition for liquid waste assets is "Good".

Asset replacement value is the estimated cost for a like-for-like replacement of an asset, not including land acquisition, ground improvement, or higher levels of treatment. The methodology used to estimate the replacement value is a combination of subject matter experts' input and unit rate estimating based on historical replacement costs. The total asset replacement value of all built assets for the regional liquid waste utility is estimated at over $30 billion. Table 1 summarizes the asset inventory and condition for each asset class:

Table 1: Liquid Waste Asset Summary

Asset Class	Inventory	Condition
Sewers	530 km of pipes	Good
Wastewater Treatment Plants	5 WWTPs	Fair
Pump Stations	33 pump stations	Good
Odour Control Facilities	2 air management facilities	Very Good
Corrosion Control Facilities	2 chemical dosing facilities	Good
SSO/CSO Storage Facilities	2 storage tanks	Good
Drainage Systems	1 dam, culverts, creeks, other assets	Fair
Works Yards	2 works yards	Good

Projected Renewal Expenditure Requirements

Over the next 30 years, the projected renewal expenditure required to maintain liquid waste assets averages $431 million annually. The projected annual renewal expenditure, as per the 2022-2026 Financial Plan, averages $413 million annually.

Projected renewal expenditure requirements in the *State of the Assets Report - Liquid Waste* are calculated based on current asset condition (inspection-based and/or aged-inferred), replacement

costs, industry-accepted estimated service life, and straight-line asset deterioration. The projected renewal expenditure requirements are subject to change based on external market factors, the addition or removal of assets, and targeted levels of service.

The renewal budget projections in the *State of the Assets Report - Liquid Waste* reflect the capital budget included in the 2022–2026 Financial Plan. For subsequent years beyond 2026, an annual 3.38% increase is applied, based on the 20-year average Non-Residential Construction Price Index for the Vancouver area.

CONTINUOUS IMPROVEMENT

Continuous improvement of asset data, information technologies, and business practices is an important and integral process of any asset management program. The report outlines several improvement opportunities to enhance the accuracy and completeness of information presented in the report to better enable data-driven decision making and sustain service level targets. Work on these improvements is already underway and will continue.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

Staff will consider the findings from this State of the Assets report when preparing financial projections for consideration in future annual budgeting cycles. Current analysis indicates that the 2022–2026 Financial Plan contains sufficient funding to adequately maintain the existing assets. Capital and operating investments needed for new assets to address growth, resilience, and regulatory changes are not considered in this report and will be addressed separately.

CONCLUSION

The *State of the Assets Report - Liquid Waste* summarizes currently available information on asset inventory, condition, and replacement value of the eight built asset classes. The overall condition of liquid waste assets has been assessed as “Good” and current analysis indicates that costs to maintain these assets projected in the 2022-2026 Financial Plan is adequate to maintain these existing assets in good condition.

Confidence in the accuracy and repeatability of data used in the report ranges from uncertain (asset valuation) to reliable (asset inventory, asset condition). Continuous improvement of asset data, information technologies, and business practices is ongoing to better enable evidence based decision making and sustain targeted service levels.

Attachment

State of the Assets Report - Liquid Waste, dated April 2022

Reference

Asset Management for Liquid Waste Services Policy, dated September 28, 2018

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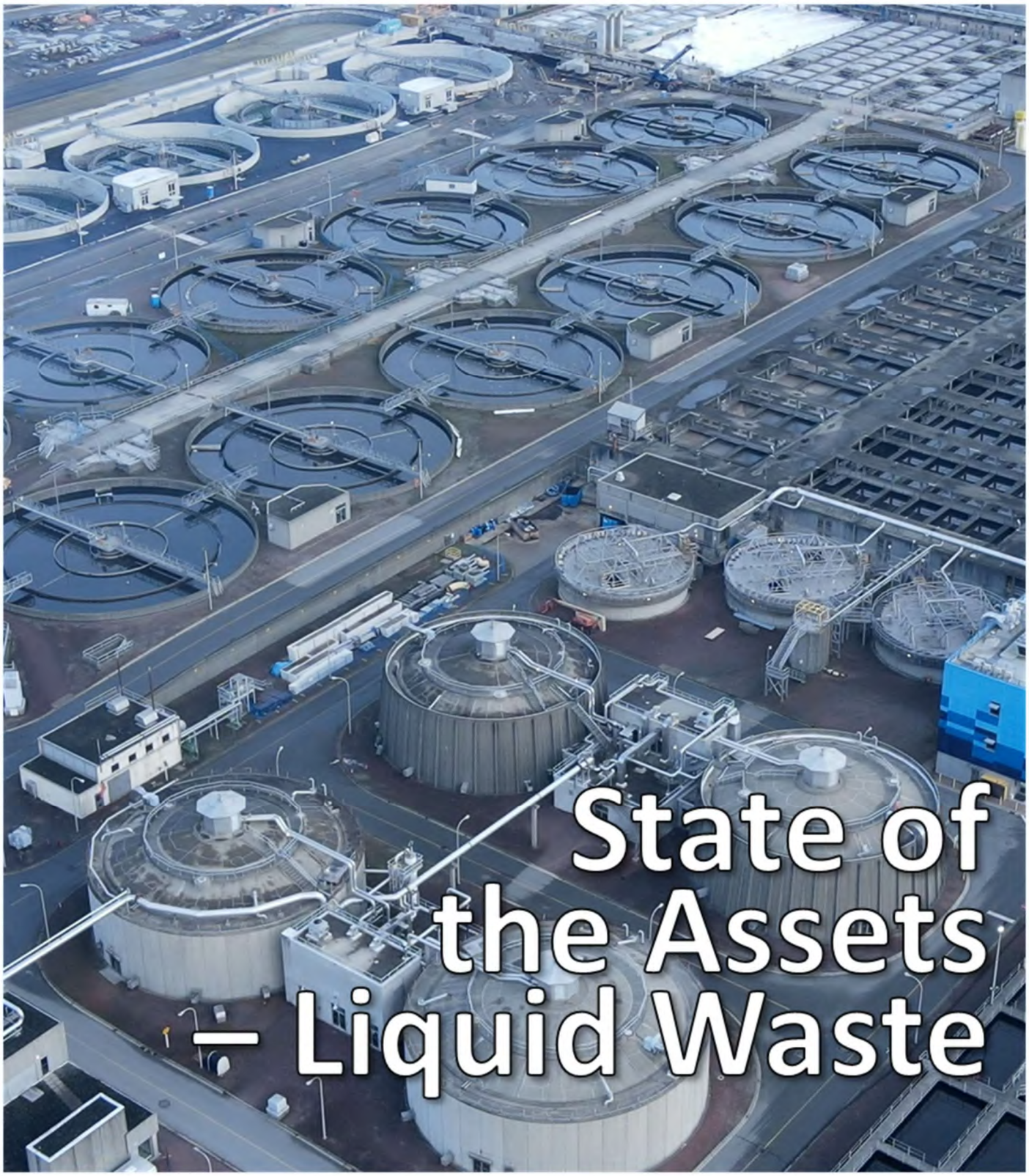

State of the Assets – Liquid Waste

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

April 2022

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Cover page photo is Annacis Island Wastewater Treatment Plant.

Executive Summary

Metro Vancouver operates and maintains built assets and natural assets to collect, transport and treat wastewater and to manage major drainage in select waterways of three drainage areas. The built assets are divided into eight classes.

The *State of the Assets Report – Liquid Waste* provides a summary of the inventory, valuation, and condition of the built assets. It also provides a forecast of long-term investment needs. Included below is the status of the five key indicators that are covered in the report.

Overall Condition Score, 2021 **2.28 ('Good')**	
Estimated % of Assets in Poor & Very Poor Condition, 2021 **16%**	Average Annual Investment Needs Forecast **$431 Million**
Estimated Replacement Value **$15-30 Billion***	Average Annual Budget Forecast **$413 Million**

* Class 5 estimate accuracy range

The methodology to determine the status of these five key indicators and recommendations for continuous improvement is also provided in the report, such as improving the accuracy and coverage of data, including asset valuation.

Table of Contents

Introduction

Metro Vancouver is continuing to refine its asset management program for liquid waste infrastructure in alignment with international best practices. The *Asset Management Policy for Liquid Waste Services* was approved in 2018 to establish principles to balance asset performance, risk, and cost of delivery of regional liquid waste services.

Based on the requirements in the policy, several activities are underway to mature the asset management practices for the liquid waste assets. These activities include:

- Improving the quality of the data and information in the asset registry
- Developing an asset assessment framework and associated assessment plans
- Conducting risk assessments
- Improvements to the information systems that manage asset data
- Ongoing development of Asset Management Plans

The outputs from these activities will significantly improve the quality of the asset information and the analytics presented in this report.

Summary of Liquid Waste Services Assets

NATURAL ASSETS

Metro Vancouver's natural assets for liquid waste services are comprised of select waterways in regional drainage areas and ecosystems which are essential to the environmental sustainability of the area. Whether naturally occurring or constructed and enhanced to improve function, these assets must be operated and maintained. If managed appropriately, natural assets do not require replacement. As the tools and methodologies for quantitatively assessing natural assets evolve, Metro Vancouver will determine how best to inventory and assess natural assets to ensure they can be managed in accordance with the principles set out in the *Asset Management Policy for Liquid Waste Services*.

BUILT ASSETS

Built assets such as wastewater treatment plants, sewers, and pump stations have been engineered/constructed to provide wastewater services to our customers.

SUMMARY BY ASSET CLASS

Methodology

Asset Inventory

The asset inventory in this first version of the *State of the Assets Report – Liquid* Waste is exclusively focused on the built assets. The assets within each asset class are generally presented at the facility level. Future editions of the report will include information on the natural assets and provide further details on the built assets within each asset class.

Asset Valuation

Asset replacement value is the estimated cost for a complete like-for-like replacement of an asset, not including land acquisition, ground improvement, or new technologies. The methodology used to estimate the replacement value is a combination of opinions from subject matter experts and unit rate estimating based on historical replacement costs. The estimated replacement value for the complete portfolio of liquid waste assets has been shown as a Class 5 estimate accuracy range.

Asset Condition

For all built asset classes, a 5-point condition scoring system is used. Condition is graded along the 5-point scale with a corresponding heat map to aid in visualizing the relative performance of the assets.

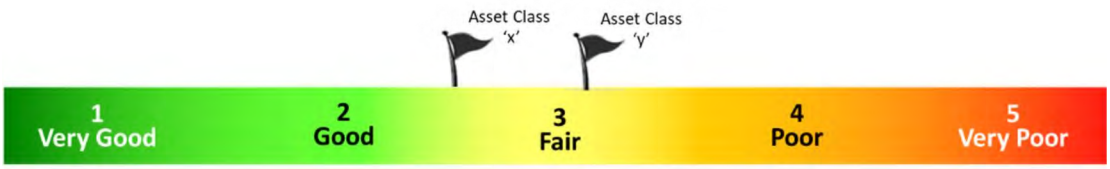


Figure 1 – Sample Asset Class Condition Scale

1: Very Good – New or excellent condition, no apparent defects.
2: Good – In good state of repair, some minor defects (e.g. finishes) that do not detract from functionality.
3: Fair – Some non-critical defects are apparent.
4: Poor – Failure possible, some critical defects are apparent and functionality is affected.
5: Very Poor – Failure imminent (within 12 months).

The condition scale will be used to benchmark the relative condition of each asset class and to assist in monitoring the changing condition of the assets over time. When evidence-based condition information is not readily available (often due to concealed location), an age-inferred analysis has been used as a proxy for asset condition. Staff knowledge is considered an example of evidence-based condition. In some cases, the condition of certain asset classes has been determined through a hybrid of evidence-based and age-based condition.

A condition score, weighted by asset valuation, is applied to each asset class so that the relative conditions can be benchmarked across the asset portfolio. To assist in evaluating the distribution across the five condition grades within each asset class, a heat-mapped donut chart is used.

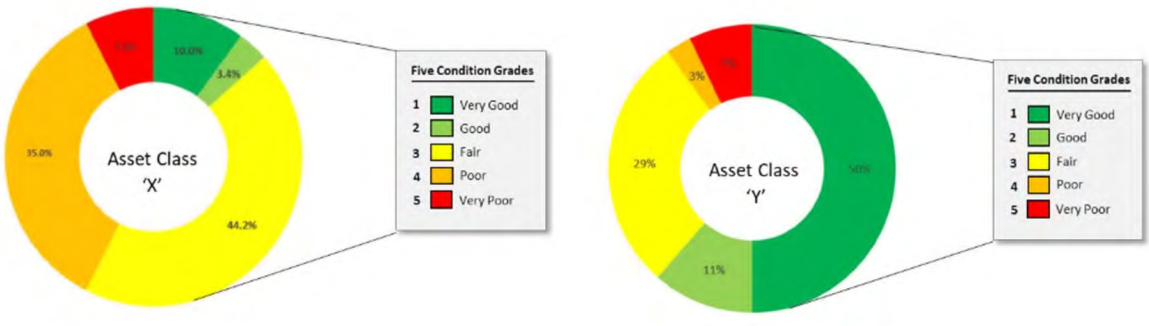


Figure 2 – Sample Asset Condition Distribution Within an Asset Class

Forecasting for Asset Investment Needs

Metro Vancouver maintains built assets with regular maintenance and replacement at end of lifecycle. New assets are added to the system through capital development.

Asset investment needs and projected renewal expenditure requirements are estimated based on the current asset inventory, condition, estimated service life, and the deterioration curve of each asset type. Investment needs are subject to change based on various factors including external market factors, the addition or removal of assets, levels of service expectations, and maintenance standards.

Renewal expenditure budget projections in the *State of the Assets Report* reflect the forecasted capital budget included in the 2022—2026 Financial Plan. From year six (2027 onwards), an annual 3.38% escalation was applied, based on the 20-year average Non-Residential Construction Price Index (NRCPI) for Vancouver from Stats Canada. For each class, a portion of the capital needs are allocated to ongoing asset maintenance.

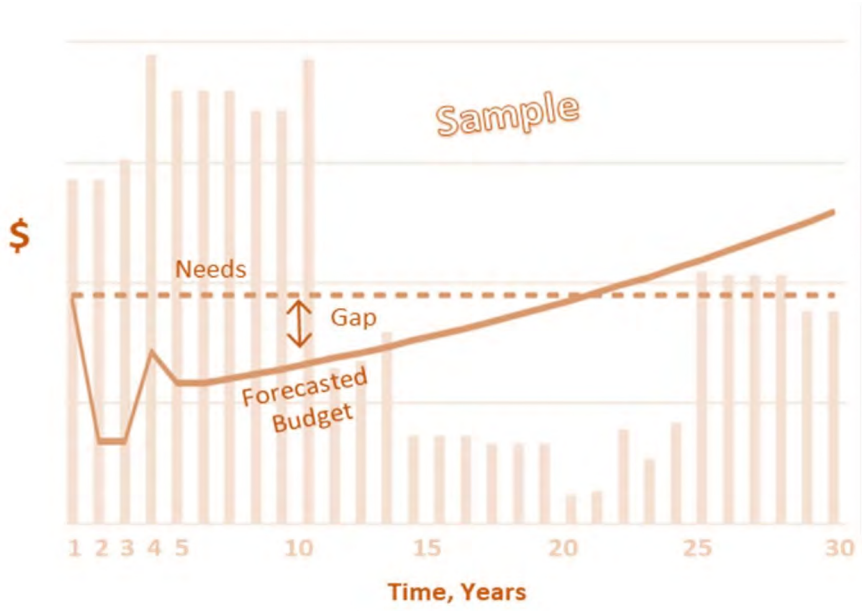


Figure 3 – Sample Investment Needs Forecast

The annual expenditure (needs) is shown as a dashed line and the annual forecasted budget (based on a 3.38% increase from year 2027 onwards) is shown as a solid line. Divergence of the two lines reveals variances between the forecasted budget and projected asset investment requirements to maintain assets at condition levels identified in the *Asset Management Policy for Liquid Waste Services*.

Asset Data Confidence

Asset data and information was collected from various sources, including the geographical information system, the work management system/asset inventory, offline inventory spreadsheets, staff interviews, and discussions with other internal stakeholder groups.

Data confidence ratings are a combination of the accuracy and repeatability of the data. Accuracy represents an estimate of the "correctness" of the raw data considering the margin of error. Repeatability represents the process for collecting and analyzing the data to produce consistent results.

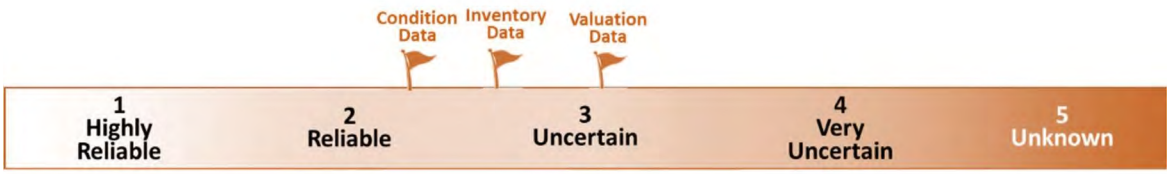


Figure 4 – Data Confidence Scale

- Inventory Data — This category is considered to be between “reliable” and “uncertain” as it was retrieved from existing systems that are generally considered current, but there are some identified gaps.
- Valuation Data — This category is deemed to be “uncertain” due to the nature of the estimating methodology and does not reflect the unique features of each site and external market factors.
- Condition Data — This category is estimated to be “reliable” due to the higher ratio of evidence-based condition assessments over age-inferred analysis.

Several initiatives are underway to address the data confidence challenges mentioned above. With improved inventory, valuation, and condition data, the estimates of investment needs and infrastructure gaps will become more accurate and repeatable. See the Asset Management Continuous Improvement section for further details.

State of the Assets Overview

Asset Valuation and Condition

The replacement value of the built assets in Metro Vancouver's liquid waste infrastructure is estimated to be in the range of $15-30 Billion. The eight asset classes have an average condition score of 2.28, weighted by asset valuation, indicating that the portfolio is currently in **"Good"** condition overall. As per the *Asset Management Policy for Liquid Waste Services,* the minimum standard for asset physical condition is Grade 3 or better for high criticality assets and Grade 4 or better for all other assets.

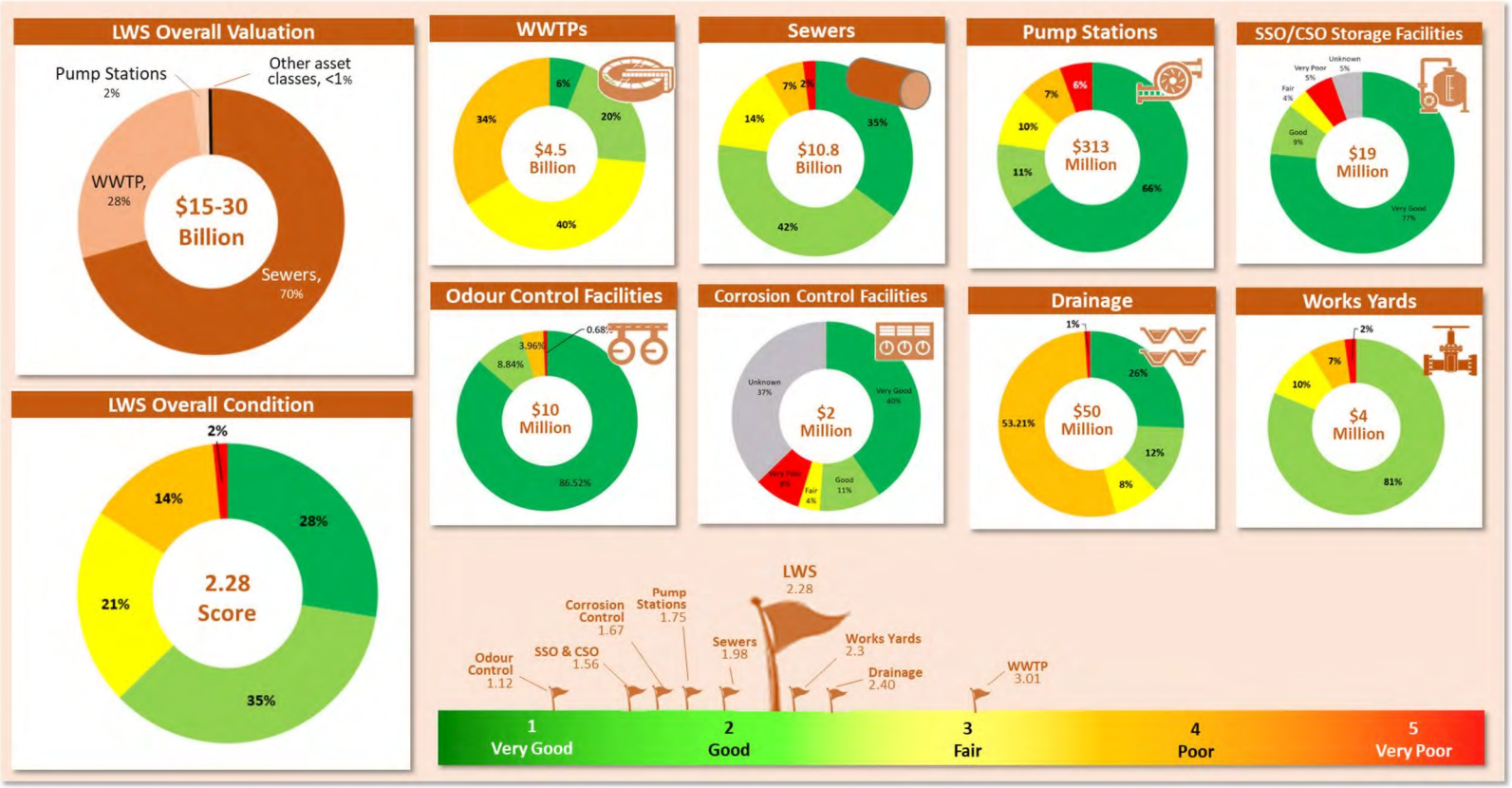


Figure 5 – Utility Valuation & Condition (2021 data)

Asset Investment Needs

The projected average annual renewal expenditure required to maintain the built assets in the liquid waste infrastructure at a minimum physical condition score of 3 (Fair) is approximately **$431 Million.** The annual renewal budget over that timeframe, based on the 2022—2026 Financial Plan, is projected to average **$413 Million** annually.

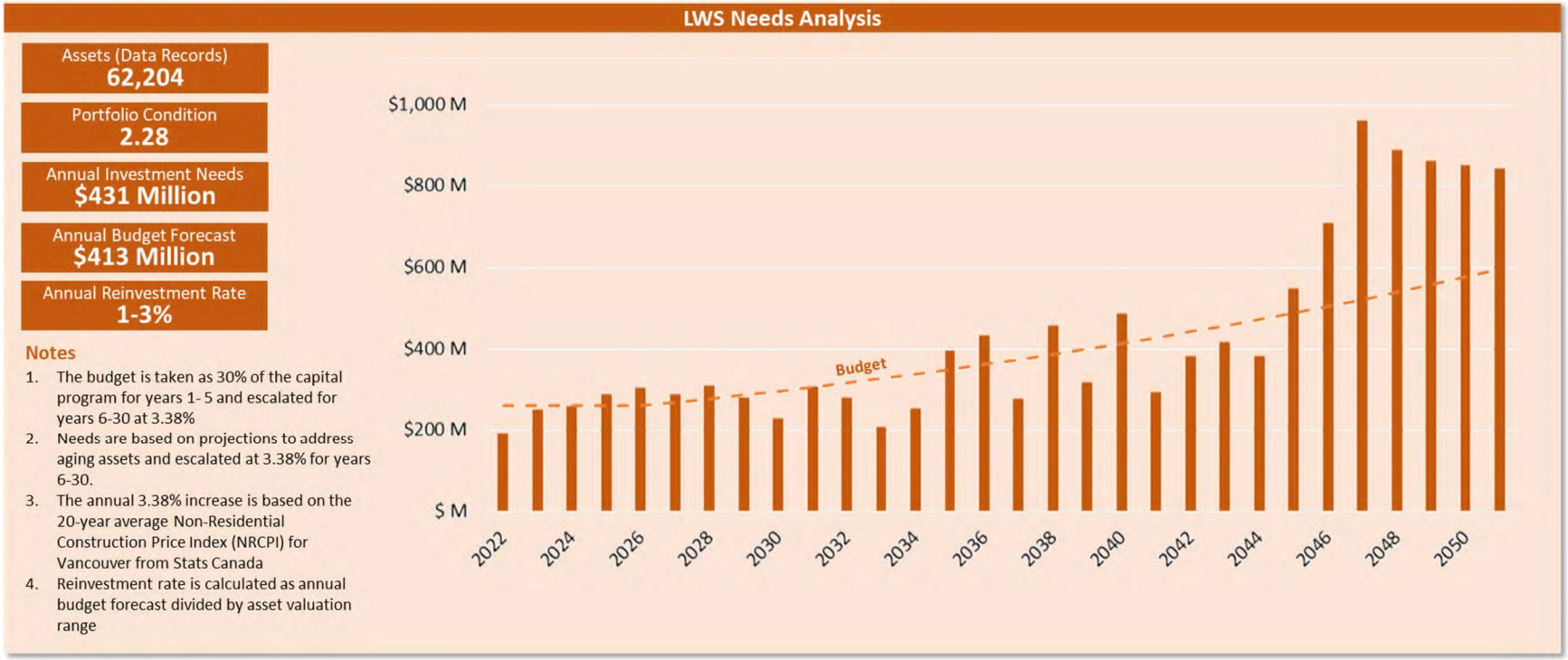


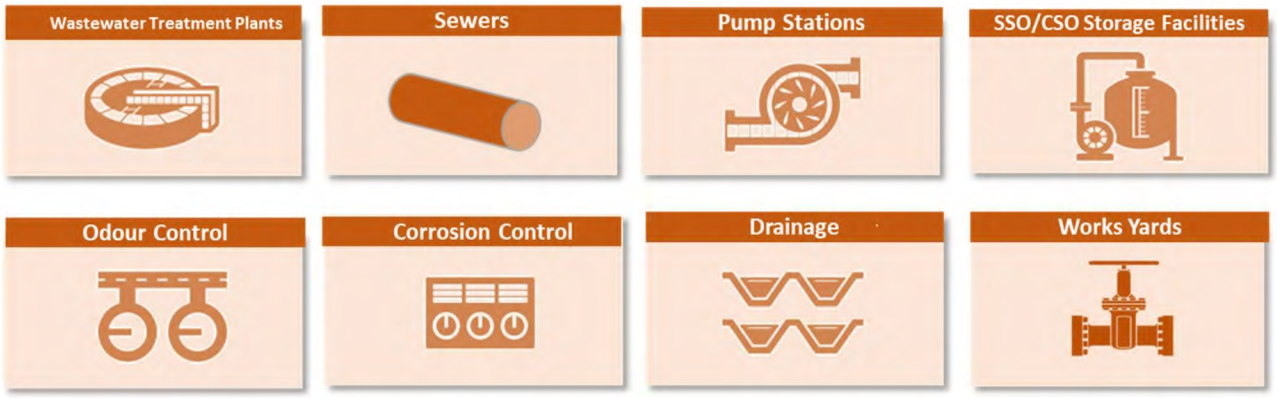
Figure 6 – Utility Investment Needs

Asset Classes

Metro Vancouver's liquid waste infrastructure is comprised of natural and built assets that provide regional wastewater services and drainage services in select waterways of the three drainage areas in the region. Liquid Waste Services manages eight asset classes: wastewater treatment plants, sewers, pump stations, sanitary sewer overflow (SSO) and combined sewer overflow (CSO) facilities, odour control facilities, corrosion control facilities, drainage, and works yards.

The eight asset classes covered in this report are predominantly built assets. The natural assets in the drainage services will be updated in future reports.

In 2020, Metro Vancouver collected and treated 460,000 million litres (ML) of sewage in the region.

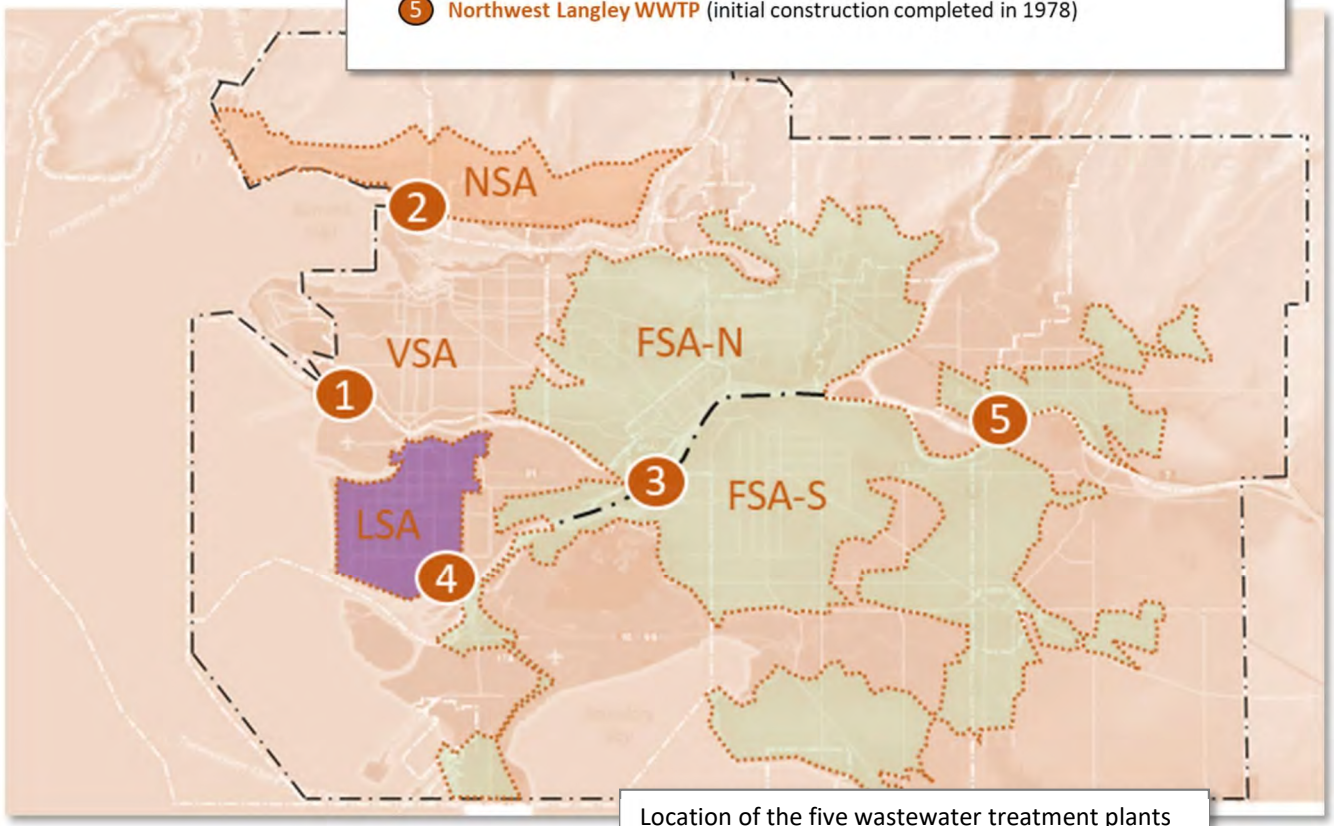


Wastewater Treatment Plants

Inventory Summary

The asset class includes five wastewater treatment plants, as follows:

1. **Iona Island WWTP** (initial construction completed in 1959, major expansion completed in 1981)
2. **Lions Gate WWTP** (initial construction completed in 1961, major expansion completed in 1972)
3. **Annacis Island WWTP** (initial construction completed in 1972, upgraded to secondary treatment in 1998)
4. **Lulu Island WWTP** (initial construction completed in 1973, upgraded to secondary treatment in 1999)
5. **Northwest Langley WWTP** (initial construction completed in 1978)



Location of the five wastewater treatment plants

NORTHWEST LANGLEY WASTEWATER TREATMENT PLANT

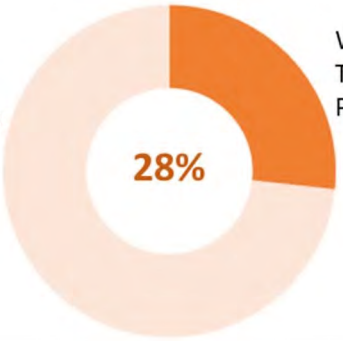
Asset Valuation

REPLACEMENT VALUE*

$4.5 Billion

* Based on historical costs for like-for-like replacement inflated to present day.

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS



Wastewater Treatment Plants

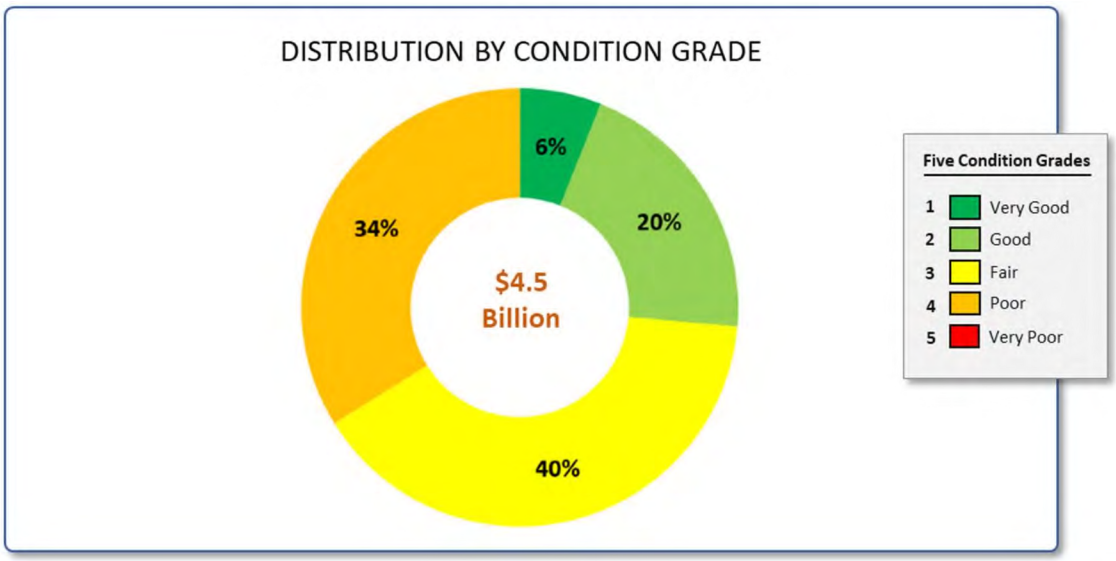
Asset Condition

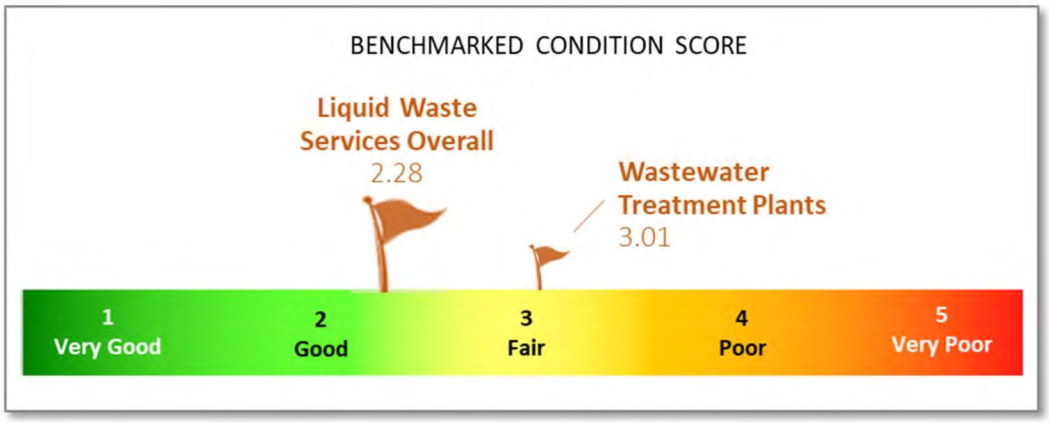
METHOD OF CONDITION ANALYSIS

Based primarily on the knowledge of subject matter experts, the wastewater treatment plants are currently considered to be in "fair" condition overall.

Age-Based

Evidence-Based


DISTRIBUTION BY CONDITION GRADE
6%
20%
34%
$4.5 Billion
40%
Five Condition Grades
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

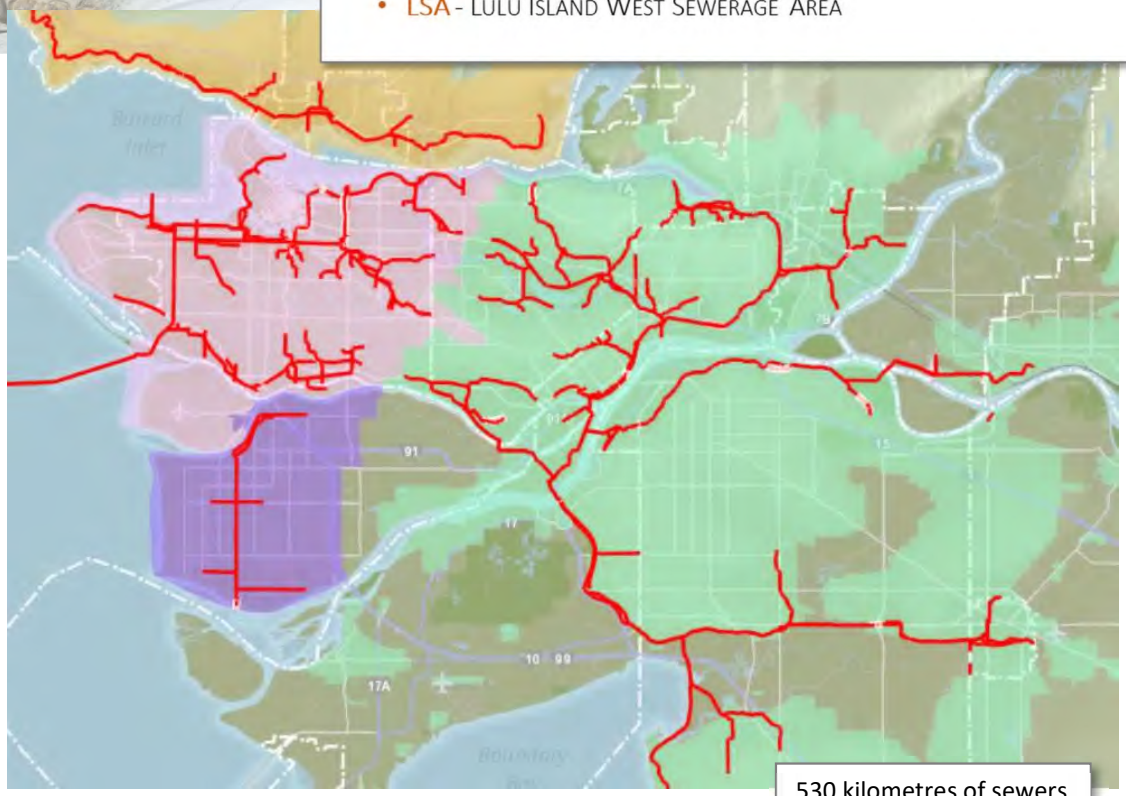

BENCHMARKED CONDITION SCORE
Liquid Waste Services Overall
2.28
Wastewater Treatment Plants
3.01
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

Sewers

INVENTORY SUMMARY

The 530 kilometres of sewers transport sewage from the municipal network to the five wastewater treatment plants. The asset class includes four (4) sewerage areas, as follows:

- NSA - North Shore Sewerage Area
- VSA - Vancouver Sewerage Area
- FSA - Fraser Sewerage Area
- LSA - Lulu Island West Sewerage Area



530 kilometres of sewers

NEW WESTMINSTER INTERCEPTOR

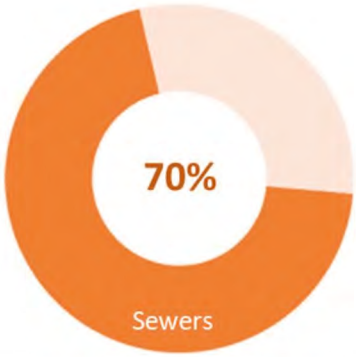
SOUTH SURREY INTERCEPTOR

Asset Valuation

REPLACEMENT VALUE

$10.8 Billion

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS

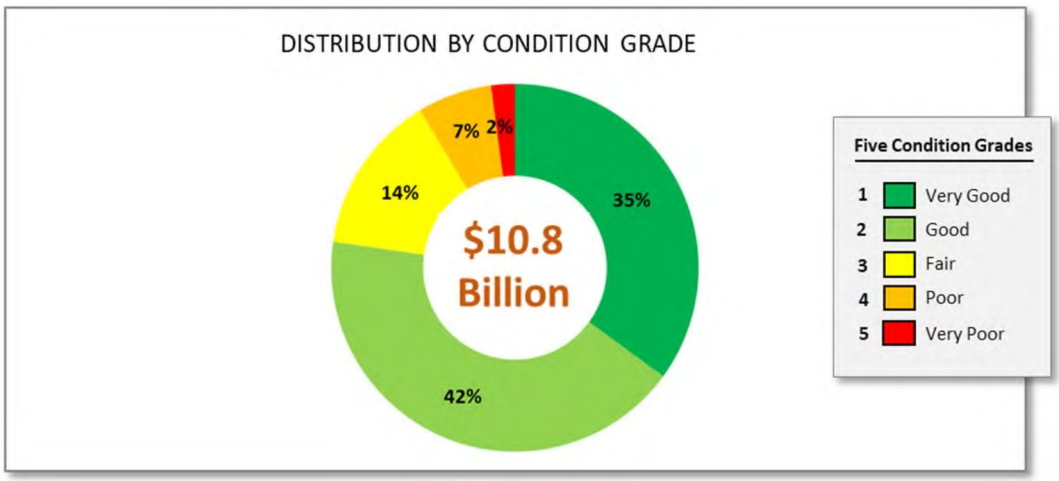


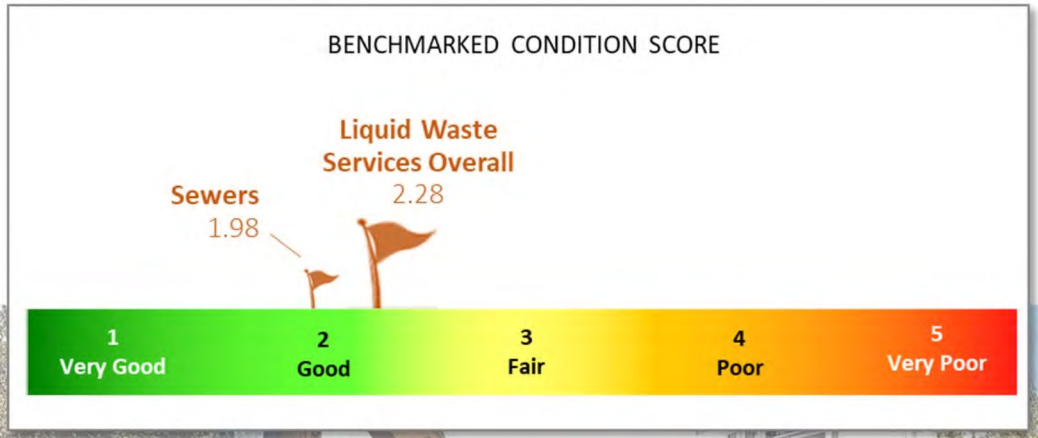
Asset Condition

The condition of the sewers has been determined through a combination of video inspection and age-based analysis. With these assessments, the sewers are currently considered to be in relatively "good" condition overall

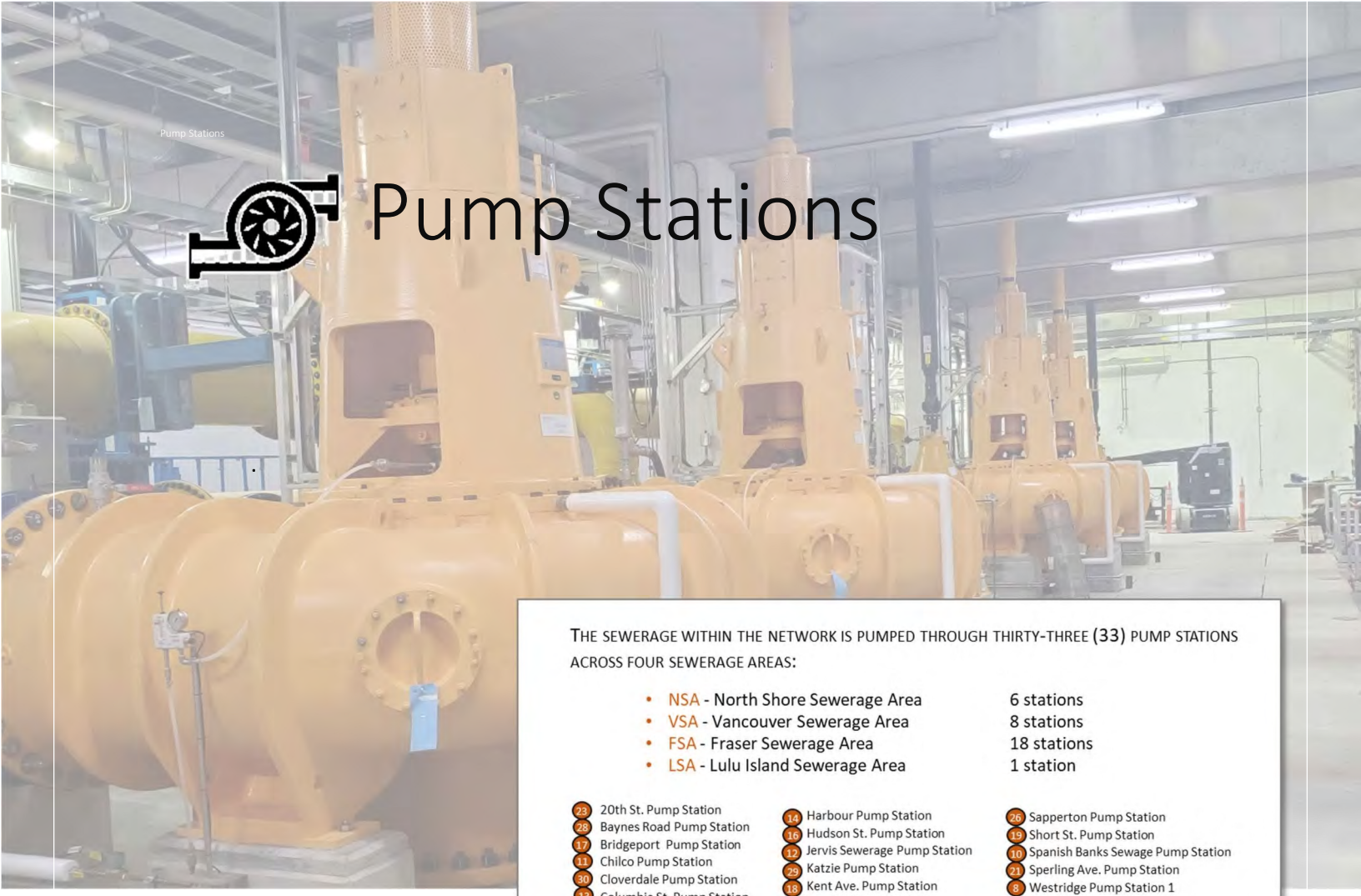
Age-Based + **Evidence-Based**

.


DISTRIBUTION BY CONDITION GRADE
35%
42%
14%
7%
2%
$10.8 Billion
Five Condition Grades
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor


BENCHMARKED CONDITION SCORE
Liquid Waste Services Overall
2.28
Sewers
1.98
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

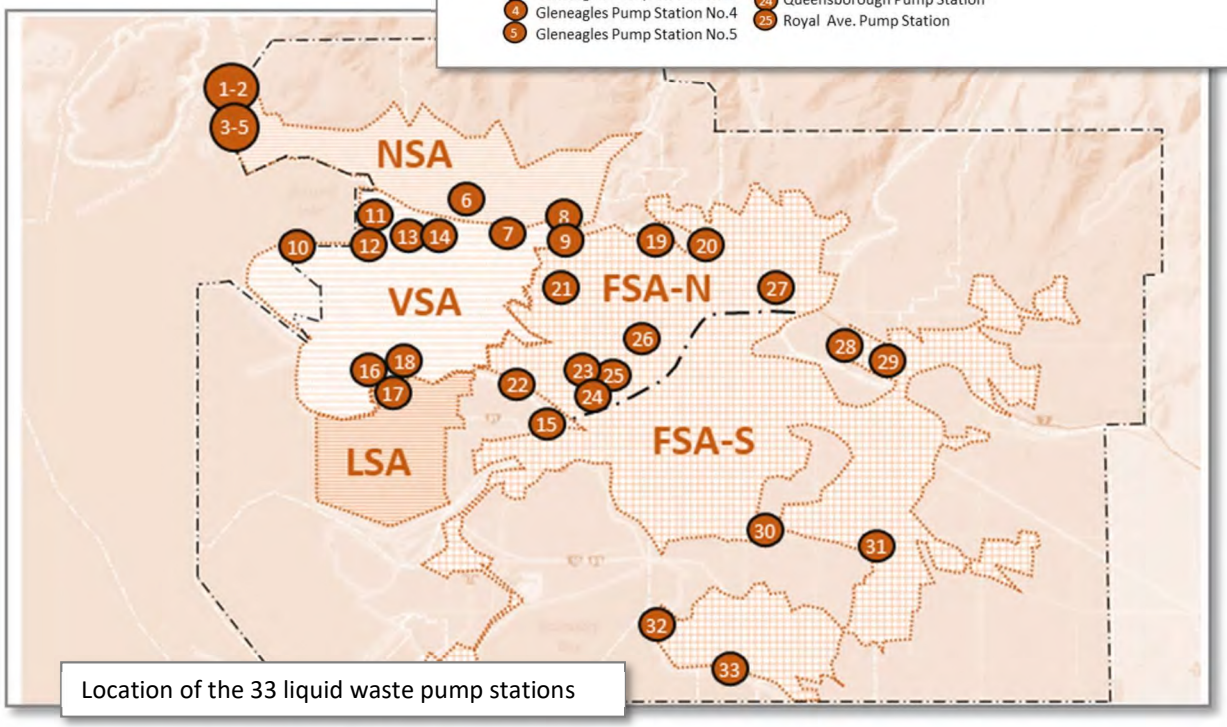
Pump Stations



THE SEWERAGE WITHIN THE NETWORK IS PUMPED THROUGH THIRTY-THREE (33) PUMP STATIONS ACROSS FOUR SEWERAGE AREAS:

- NSA - North Shore Sewerage Area — 6 stations
- VSA - Vancouver Sewerage Area — 8 stations
- FSA - Fraser Sewerage Area — 18 stations
- LSA - Lulu Island Sewerage Area — 1 station

23 20th St. Pump Station
28 Baynes Road Pump Station
17 Bridgeport Pump Station
11 Chilco Pump Station
30 Cloverdale Pump Station
13 Columbia St. Pump Station
32 Crescent Beach Pump Station
15 East Richmond Pump Station
1 Gleneagles Pump Station No.1
2 Gleneagles Pump Station No.2
3 Gleneagles Pump Station No.3
4 Gleneagles Pump Station No.4
5 Gleneagles Pump Station No.5
14 Harbour Pump Station
16 Hudson St. Pump Station
12 Jervis Sewerage Pump Station
29 Katzie Pump Station
18 Kent Ave. Pump Station
31 Langley Pump Station
6 Lynn Sewage Pump Station
22 Marshend Sewage Pump Station
27 Port Coquitlam Pump Station
20 Port Moody Pump Station
24 Queensborough Pump Station
25 Royal Ave. Pump Station
26 Sapperton Pump Station
19 Short St. Pump Station
10 Spanish Banks Sewage Pump Station
21 Sperling Ave. Pump Station
8 Westridge Pump Station 1
9 Westridge Pump Station 2
33 White Rock Pump Station
7 Willingdon Ave. Pump Station



Location of the 33 liquid waste pump stations

]

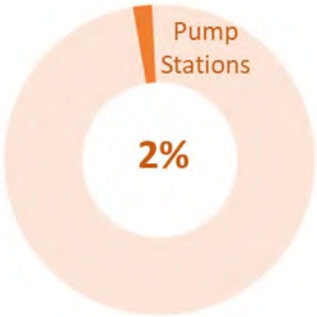
SPERLING PUMP STATION

Asset Valuation

REPLACEMENT VALUE

$313 Million

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS

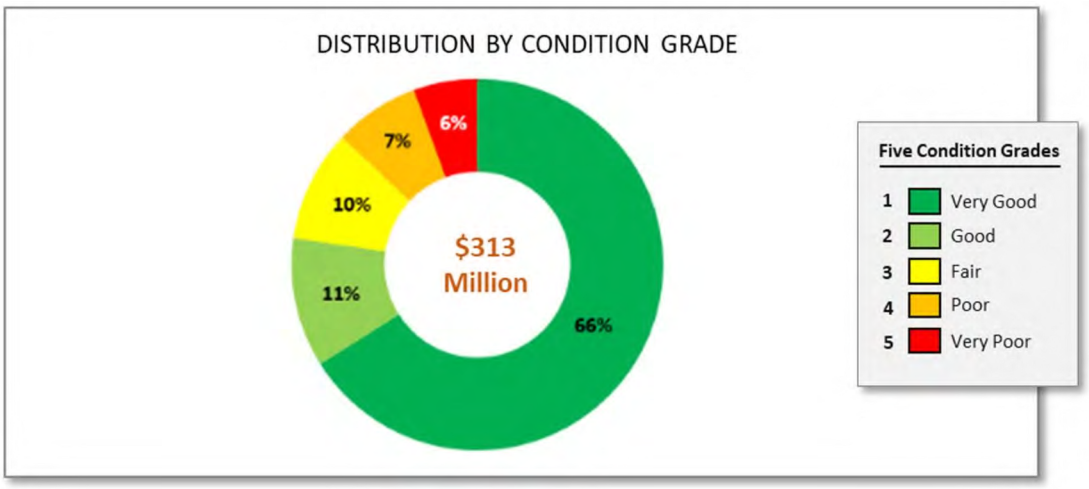


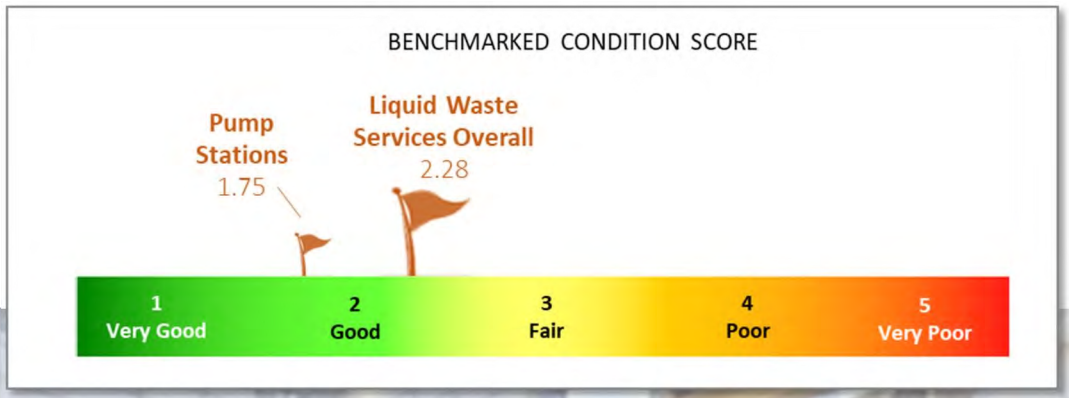
Asset Condition

METHOD OF CONDITION ANALYSIS

Based on a combination of field assessments and age-based analysis, the pump stations are currently considered to be in "good" condition overall.

Age-Based + **Evidence-Based**


DISTRIBUTION BY CONDITION GRADE
6%
7%
10%
11%
66%
$313 Million
Five Condition Grades
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

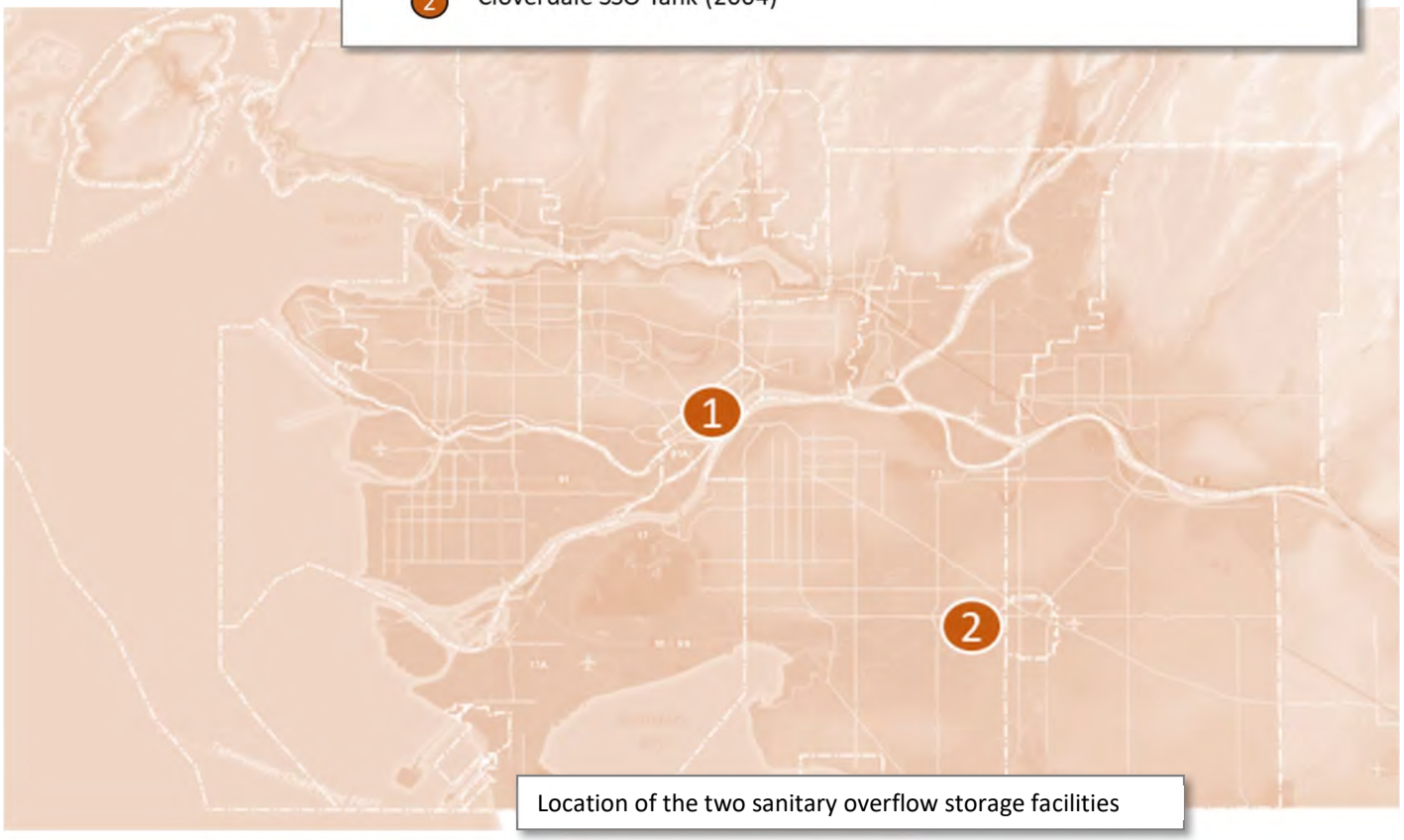

BENCHMARKED CONDITION SCORE
Pump Stations
1.75
Liquid Waste Services Overall
2.28
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

SSO/CSO Storage Facilities

INVENTORY SUMMARY

The sanitary sewer overflow (SSO) and combined sewer overflow (CSO) facilities temporarily store sewage to prevent overflows. The portfolio includes two tanks:

1. New Westminster CSO Storage Facility (2012)
2. Cloverdale SSO Tank (2004)



Location of the two sanitary overflow storage facilities

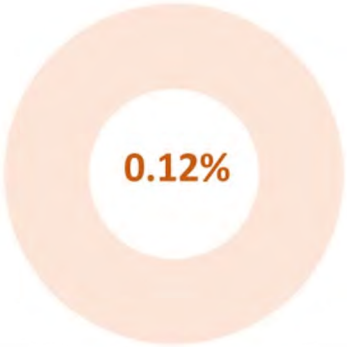
NEW WESTMINSTER COMBINED SEWER OVERFLOW FACILITY

Asset Valuation

REPLACEMENT VALUE

$19 Million

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS



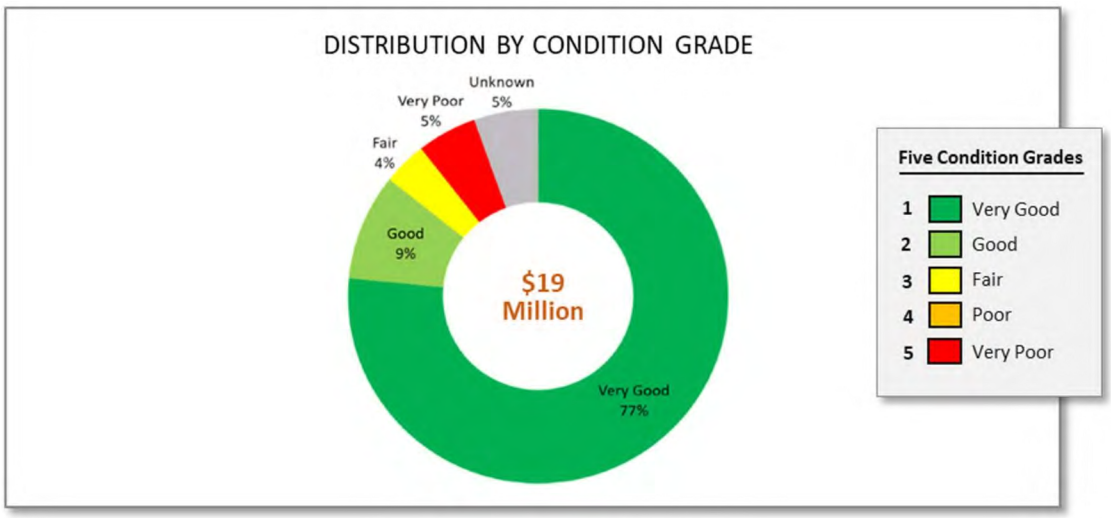
Asset Condition

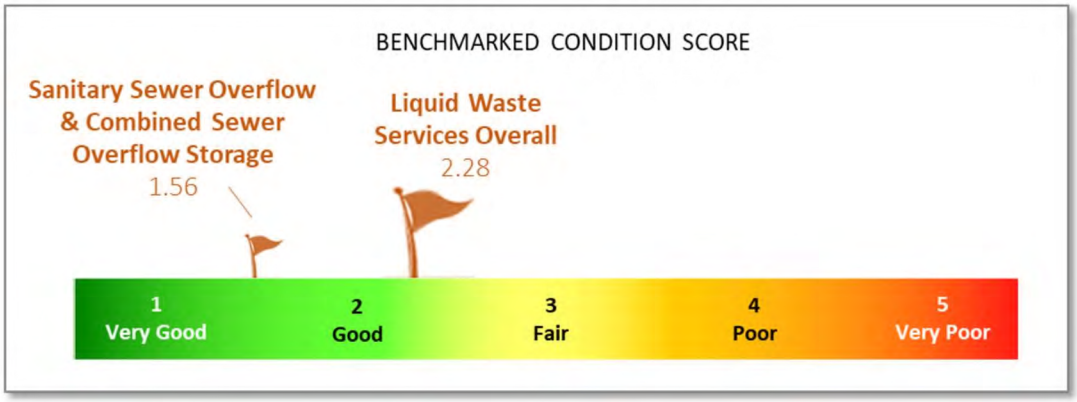
METHOD OF CONDITION ANALYSIS

Based primarily on evidence-based analysis, the sanitary sewer overflow and combined sewer overflow storage facilities are currently considered to be in relatively "good" condition overall.

Age-Based

Evidence-Based


DISTRIBUTION BY CONDITION GRADE
Unknown 5%
Very Poor 5%
Fair 4%
Good 9%
$19 Million
Very Good 77%
Five Condition Grades
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

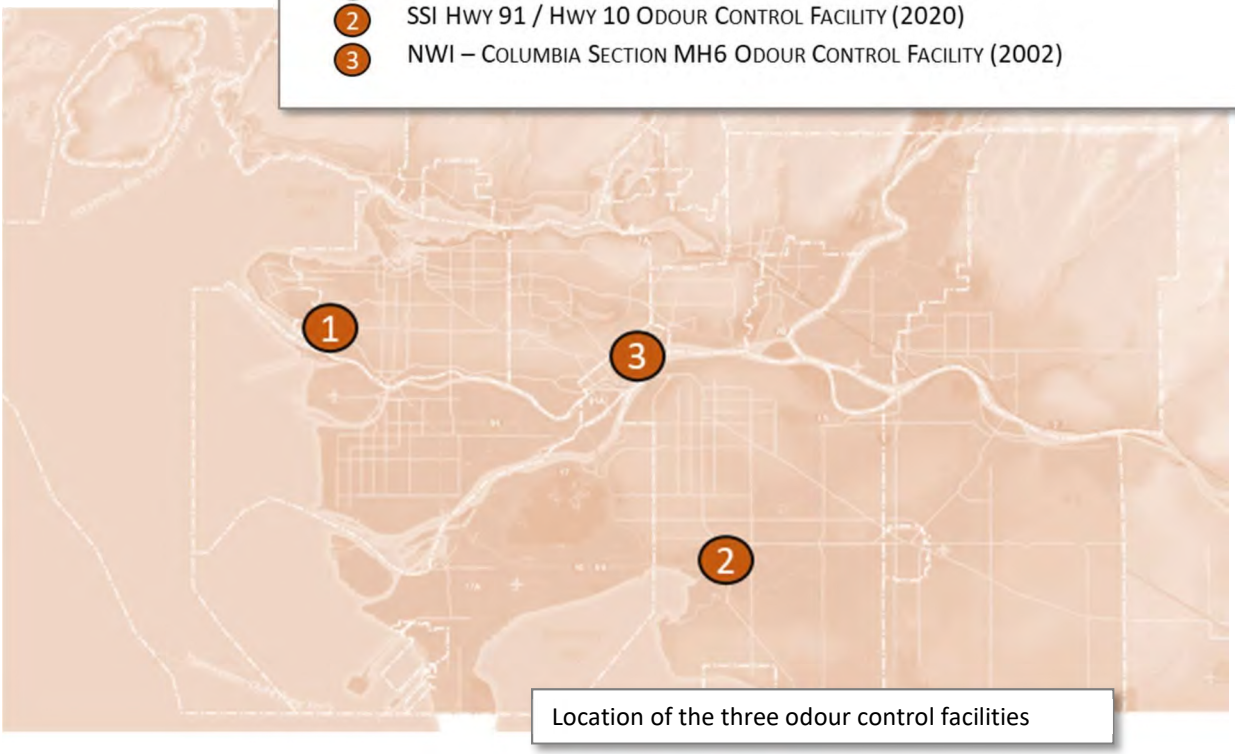

BENCHMARKED CONDITION SCORE
Sanitary Sewer Overflow & Combined Sewer Overflow Storage
1.56
Liquid Waste Services Overall
2.28
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

Odour Control Facilities

INVENTORY SUMMARY

The odour control facilities (also known as air management facilities) reduce the odour from sewage to the environment. This asset class includes three (3) existing facilities.

1. Highbury Air Management Facility (2020)
2. SSI Hwy 91 / Hwy 10 Odour Control Facility (2020)
3. NWI – Columbia Section MH6 Odour Control Facility (2002)



Location of the three odour control facilities

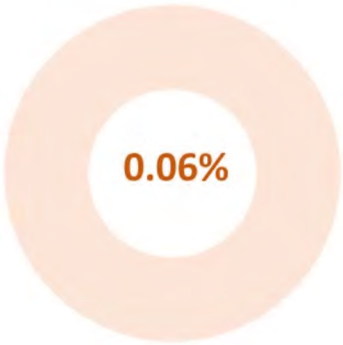
HIGHBURY AIR MANAGEMENT FACILITY

Asset Valuation

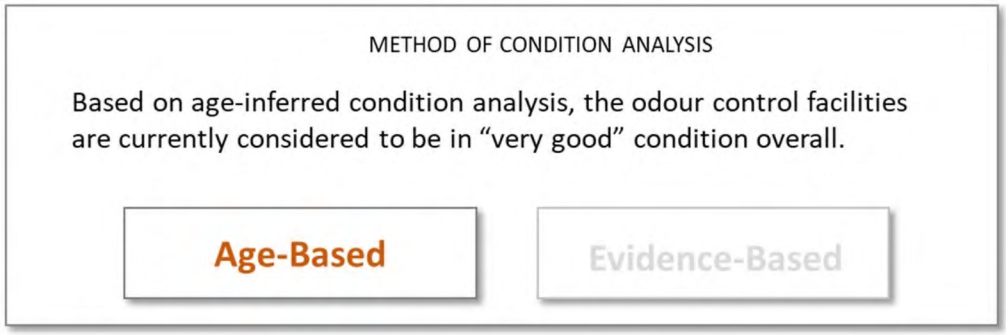
REPLACEMENT VALUE

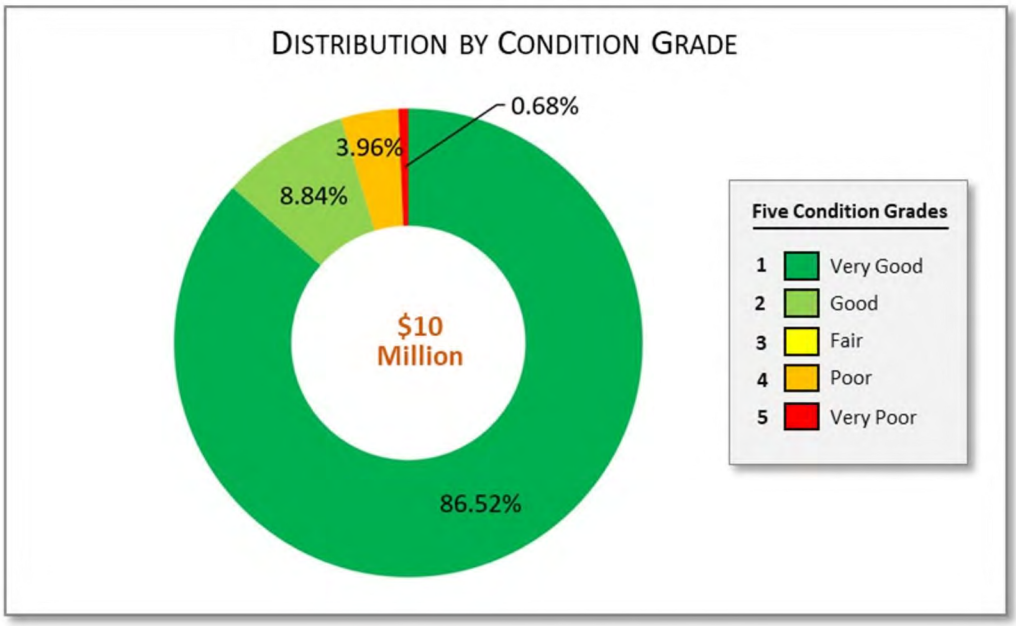
$10 Million

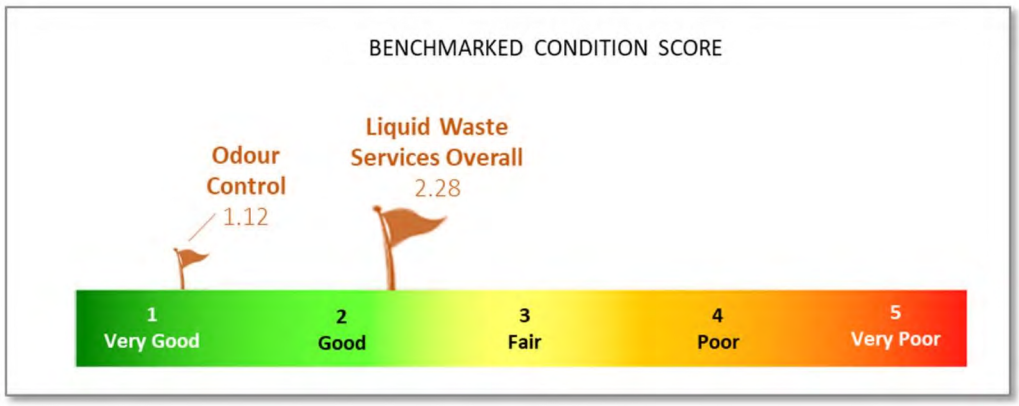
VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS



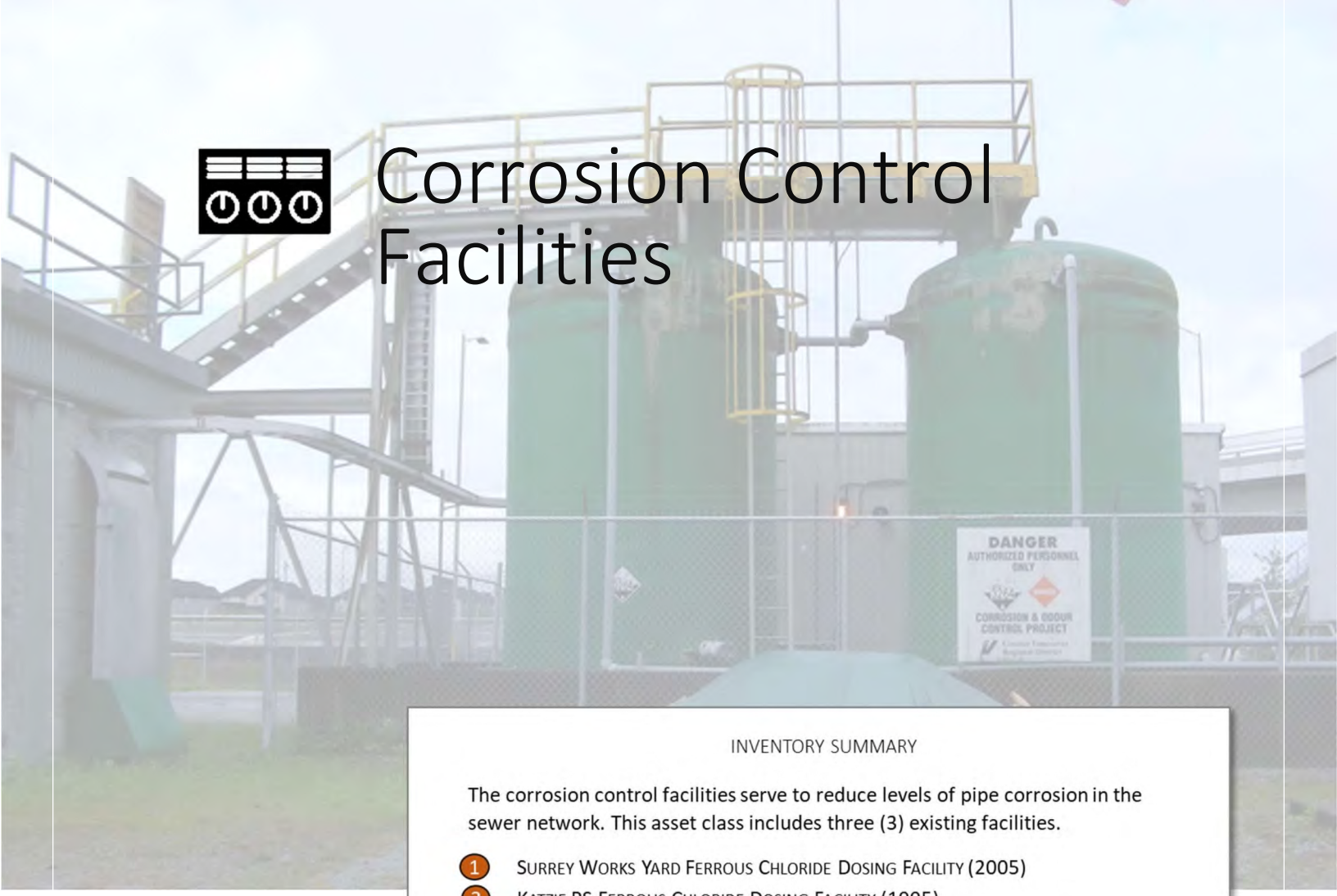
Asset Condition







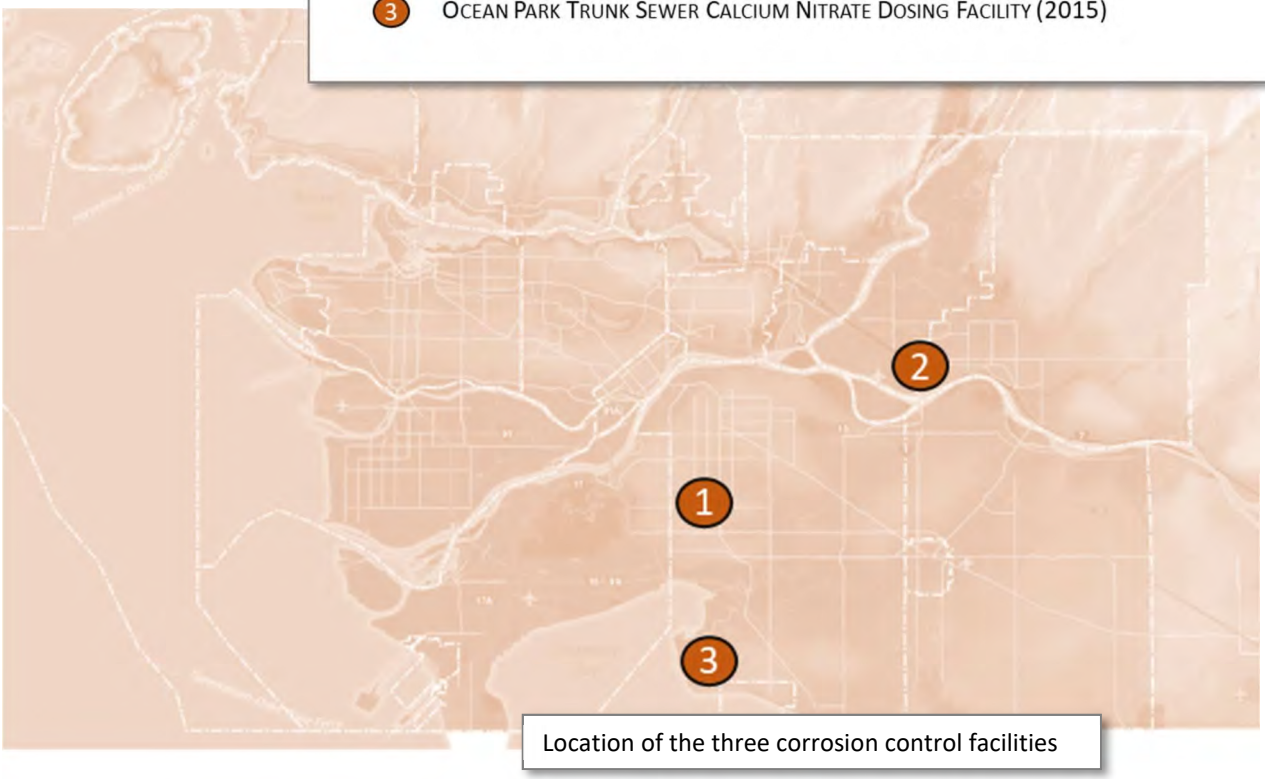
Corrosion Control Facilities



INVENTORY SUMMARY

The corrosion control facilities serve to reduce levels of pipe corrosion in the sewer network. This asset class includes three (3) existing facilities.

1. Surrey Works Yard Ferrous Chloride Dosing Facility (2005)
2. Katzie PS Ferrous Chloride Dosing Facility (1995)
3. Ocean Park Trunk Sewer Calcium Nitrate Dosing Facility (2015)



Location of the three corrosion control facilities

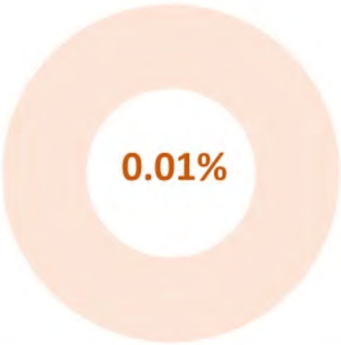
KATZIE FERROUS OXIDE CHLORIDE DOSING FACILITY

Asset Valuation

REPLACEMENT VALUE

$2 Million

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS

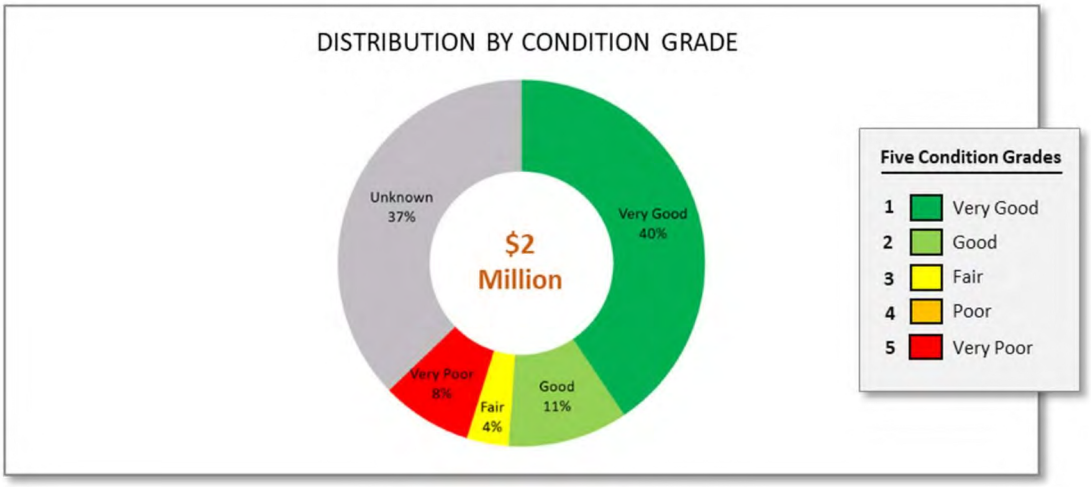


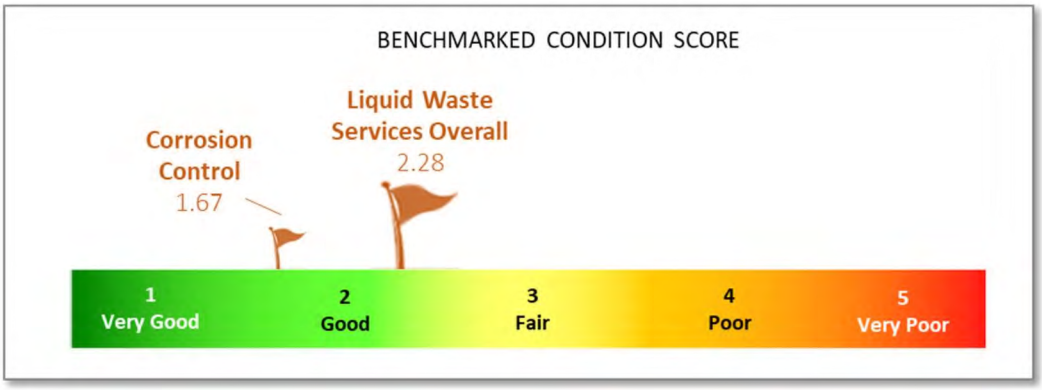
Asset Condition

METHOD OF CONDITION ANALYSIS

Based on a combination of field assessments and age-based analysis, the corrosion control facilities are currently considered to be in relatively "good" condition overall

Age-Based + **Evidence-Based**


DISTRIBUTION BY CONDITION GRADE
Unknown 37%
Very Good 40%
$2 Million
Very Poor 8%
Fair 4%
Good 11%
Five Condition Grades
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor


BENCHMARKED CONDITION SCORE
Corrosion Control 1.67
Liquid Waste Services Overall 2.28
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

Drainage

INVENTORY SUMMARY*

The drainage system includes one dam as well as several culverts and creeks that collect, store, and discharge storm water. This asset class includes three drainage areas:

1. UNIVERSITY DRAINAGE AREA
2. STILL CREEK / BRUNETTE RIVER DRAINAGE AREA
3. PORT MOODY / COQUITLAM DRAINAGE AREA

* Natural assets will be addressed in a future report.

Location of the three drainage areas

CARIBOO DAM

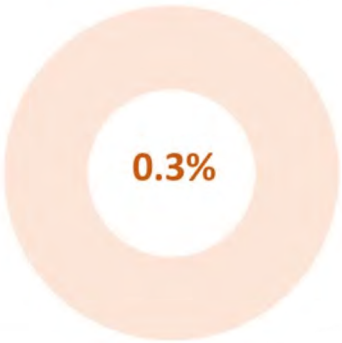
Asset Valuation

REPLACEMENT VALUE*

$50 Million

* Excludes natural assets

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS



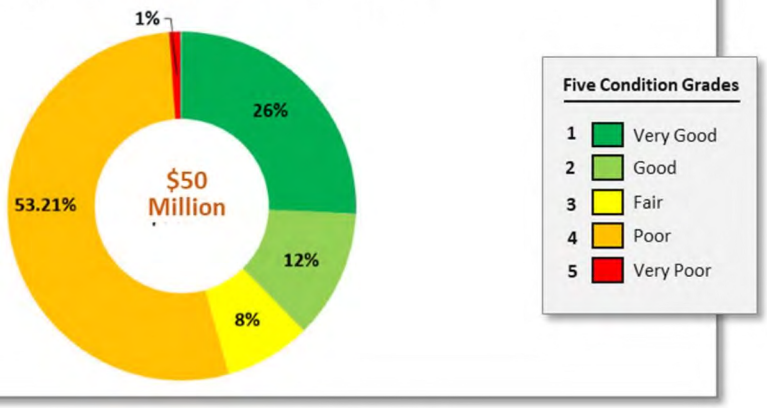
Asset Condition

METHOD OF CONDITION ANALYSIS

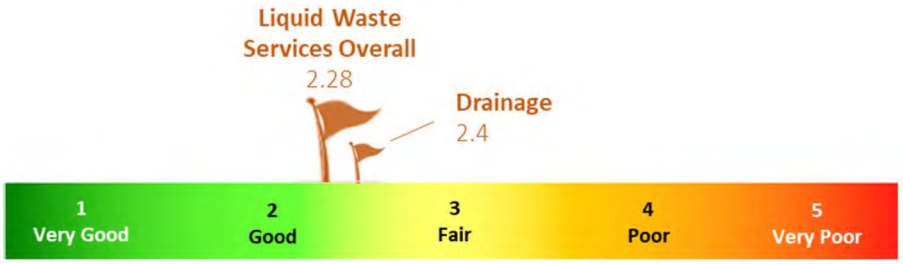
Based on a combination of field assessments and age-based analysis, the drainage assets are currently considered to be in relatively "good" condition overall

Age-Based + **Evidence-Based**

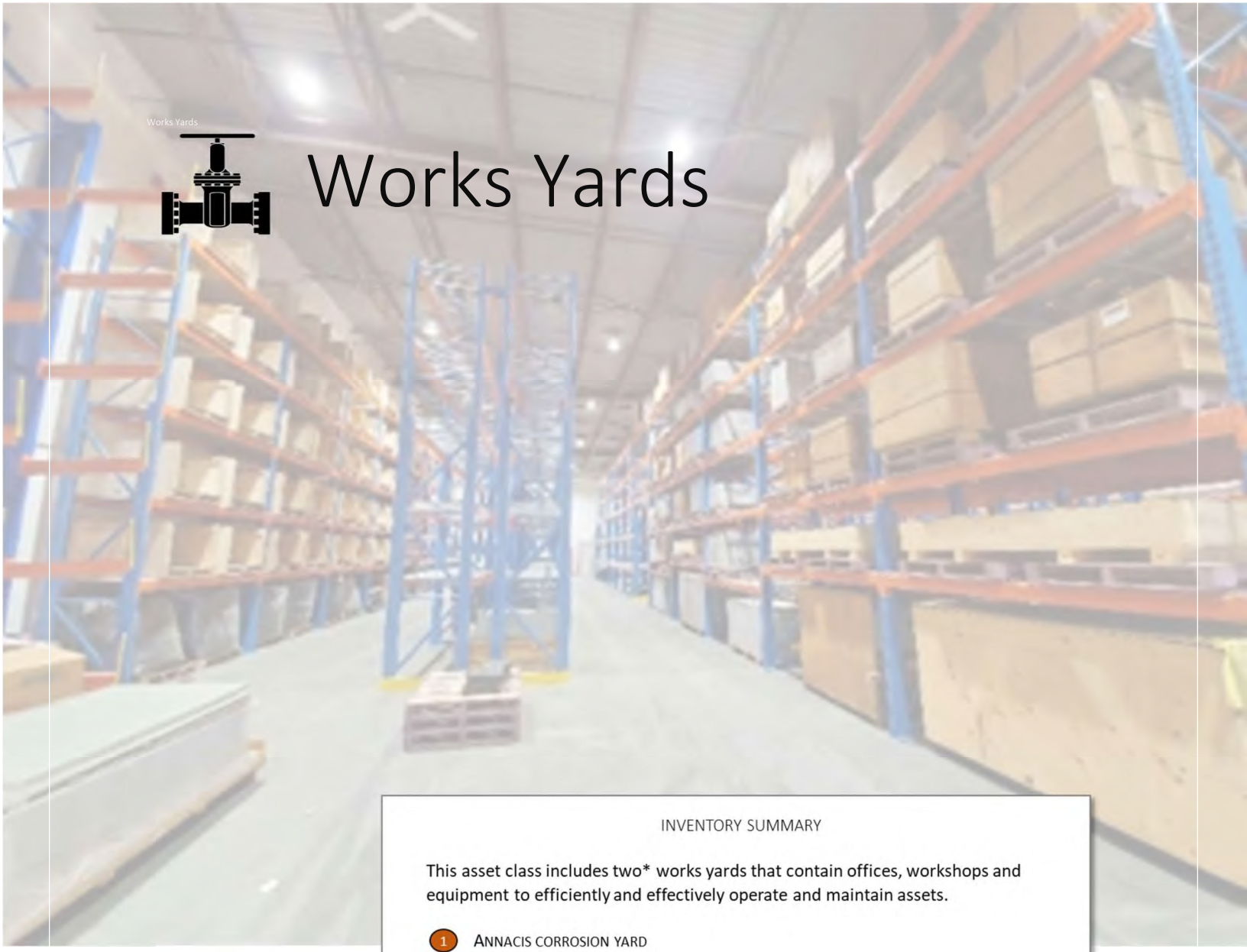
DISTRIBUTION BY CONDITION GRADE



BENCHMARKED CONDITION SCORE



Works Yards

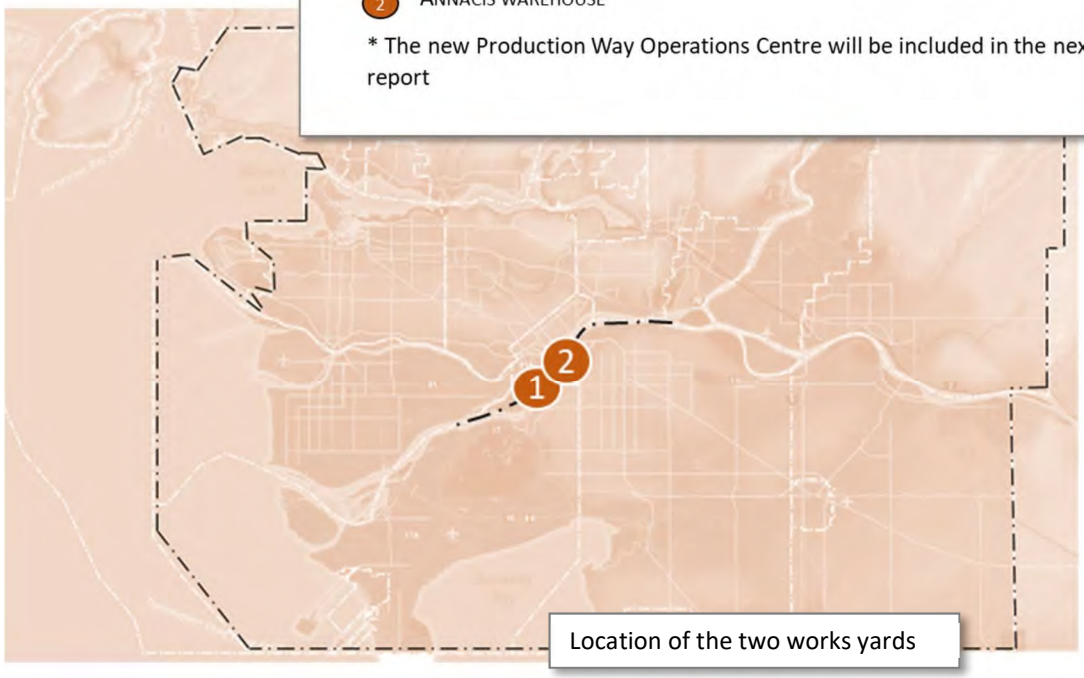


INVENTORY SUMMARY

This asset class includes two* works yards that contain offices, workshops and equipment to efficiently and effectively operate and maintain assets.

1. ANNACIS CORROSION YARD
2. ANNACIS WAREHOUSE

* The new Production Way Operations Centre will be included in the next report



Location of the two works yards

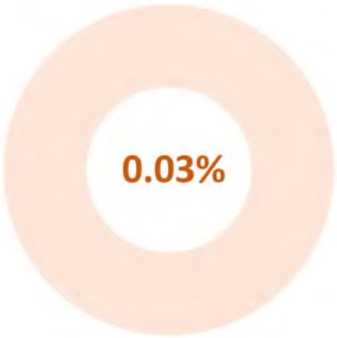
ANNACIS CORROSION YARD

Asset Valuation

REPLACEMENT VALUE

$4.4 Million

VALUATION RELATIVE TO ALL LIQUID WASTE ASSETS

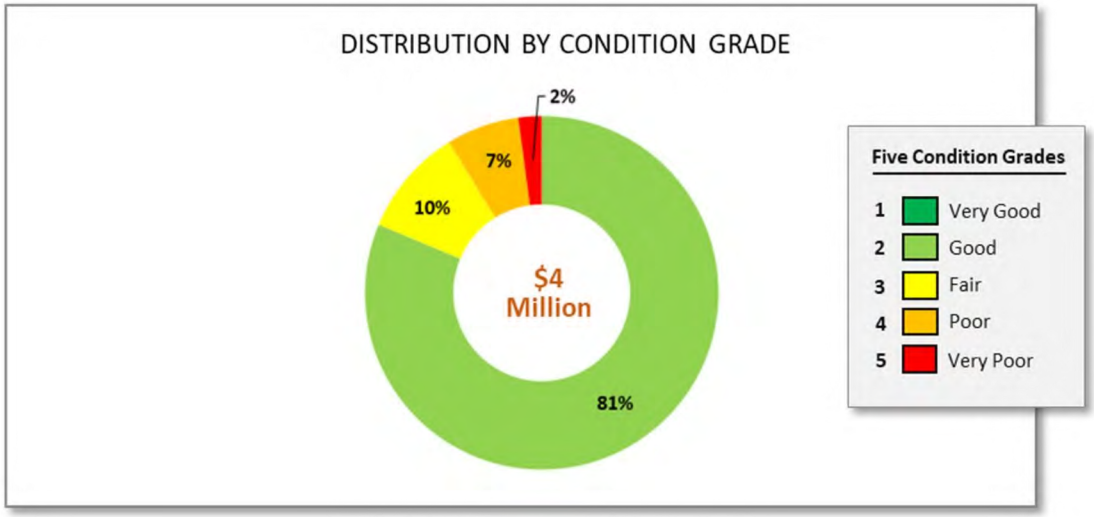


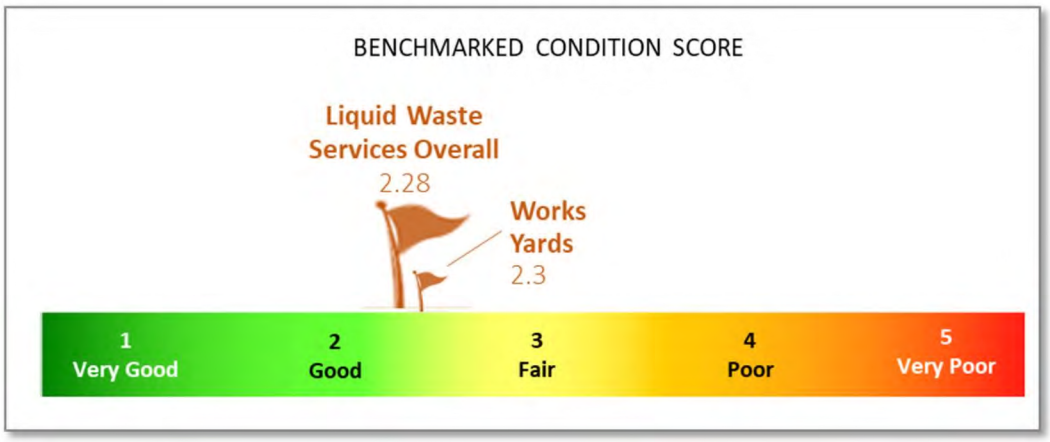
Asset Condition

METHOD OF CONDITION ANALYSIS

Based on a combination of field assessments and age-based analysis, the works yards are currently considered to be in relatively "good" condition overall.

Age-Based + **Evidence-Based**


DISTRIBUTION BY CONDITION GRADE
2%
7%
10%
$4 Million
81%
Five Condition Grades
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor


BENCHMARKED CONDITION SCORE
Liquid Waste Services Overall
2.28
Works Yards
2.3
1 Very Good
2 Good
3 Fair
4 Poor
5 Very Poor

Asset Management Continuous Improvement

Continuous improvement of asset data, information technologies, and business practices is an important and integral process of any asset management program. The following asset management improvement opportunities have been identified to enhance the accuracy and completeness of information presented in this State of the Assets Report and better enable data-driven decision making and sustain targeted service levels. Work on each of these improvement opportunities is currently underway.

Asset Register

- Improve completeness, accuracy, and repeatability of asset data
- Update asset valuation of each asset class
- Store key asset information or attributes in a standard asset hierarchy
- Continue to update the asset register for new assets brought into service

Asset Condition Assessments

- Prepare and update asset assessment plans for each asset class
- Collect asset condition and performance information and replace current age-based condition data
- Utilize modern inspection technologies and opportunities when infrastructure is exposed to collect asset condition information for infrastructure that is not readily accessible
- Develop asset deterioration curves for each asset type
- Update estimated service life of each asset type

Asset Risk Assessments

- Develop risk registers for each asset class
- Implement risk management framework

Information Systems

- Identify gaps and implement improvements in related information systems
- Improve asset related data analytics and reporting capabilities

Asset Management Plans

- Complete and update long term investment needs assessment
- Develop asset management plans to summarize asset information and identify risks to service delivery
- Prepare long range infrastructure investment scenarios to address the risks

Appendix A – Glossary

Asset Class is a group of facilities that have similar characteristics and deliver a common type of service.

Asset Portfolio is a collection of the asset classes within a utility, such as Water Services or Liquid Waste Services.

Asset Type is a group or category of assets within a facility that have common characteristics and are a subset of the Asset Class.

Data Confidence is the correctness and repeatability of the data.

Deterioration Curve is the rate of physical or non-physical degradation of an Asset Type over time

Estimated Service Life is a measure of how long the asset is expected to deliver an adequate level of service.

Investment Needs is the projected renewal expenditure requirements.

Non-Residential Construction Price Index (NRCPI) measures changes in contractors' selling prices of new non-residential building construction by class of structure (commercial, industrial, institutional).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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Liquid Waste Committee

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

Date: April 29, 2022 Meeting Date: May 18, 2022

Subject: **Environmental Risk Management Policy for Liquid Waste Services**

RECOMMENDATION

That the GVS&DD Board approve the *Environmental Risk Management Policy for Liquid Waste Services*, as presented in the report dated April 29, 2022, titled "Environmental Risk Management Policy for Liquid Waste Services".

EXECUTIVE SUMMARY

Metro Vancouver Liquid Waste Services (LWS) is developing an Environmental Management System (EMS) based on ISO 14001:2015. A key aspect to its success is the development and adoption of a Board approved environmental policy. The proposed new *Environmental Risk Management Policy for Liquid Waste Services*, and related document, *Environmental Performance Goals for Liquid Waste Services,* are presented for Committee and Board consideration in this report.

Establishment of the *Environmental Risk Management Policy for Liquid Waste Services* formalizes the utility's commitment to achieving excellence in environmental performance, provides a framework for further development of the EMS, and drives LWS decision-making to support ongoing priority risk mitigation. LWS has been working in conjunction with Water Services to develop EMS components beneficial to both utilities.

PURPOSE

To seek the GVS&DD Board's approval of the attached *Environmental Risk Management Policy for Liquid Waste Services*.

BACKGROUND

Metro Vancouver is committed to the protection of public health and the environment through its numerous policies and long range plans. The Liquid Waste utility is fulfilling this commitment following the ISO 14001:2015 Environmental Management Systems. By implementing an internationally recognized standard approach, it allows Metro Vancouver to establish a system for robust protocols/procedures, staff training, regular check-ups and corrective habits to achieve regulatory compliance in all areas of liquid waste management. Development of the proposed *Environmental Risk Management Policy for Liquid Waste Services* is an ISO 14001 requirement and requires Liquid Waste Committee review and GVS&DD Board approval.

ENVIRONMENTAL MANAGEMENT SYSTEM

An Environmental Management System (EMS) is an organized and systematic way of managing an organization's operations to ensure regulatory compliance, identify and manage environmental risks,

minimize adverse environmental impacts, prevent pollution, and conserve resources. An EMS serves as a proactive tool to enhance environmental performance with a focus on due diligence and continual improvement. EMS elements include policy, plans, protocols, procedures, training, performance measurement and management review.

Environmental Risk Management Policy

The *Environmental Risk Management Policy for Liquid Waste Services* follows the international ISO 14001:2105 Environmental Management Systems (EMS) standard for managing environmental risks. It will signal to the Board, employees, and the public that the GVS&DD is a responsible corporate citizen, and is serious about managing environmental risks. It supports inclusion of environmental regulatory criteria and risk-based decision-making into business processes. The *Environmental Risk Management Policy* will serve to broaden environmental awareness and promote proactive risk management. It will also demonstrate management support for environmental risk reduction initiatives and provide staff with clear environmental performance expectations as defined by policy commitments and related goals.

The *Environmental Risk Management Policy* commits LWS to implement and maintain an EMS based on ISO 14001, in order to systematically and proactively identify, prioritize, and manage environmental risks. This process involves a continuous plan-do-check -change cycle of:

- Determining significant environmental risks;
- Setting performance objectives and metrics;
- Developing plans, programs, procedures, protocols, and practices;
- Using knowledge of environmental risk to inform asset management and capital infrastructure planning;
- Increasing staff awareness and empowering them to generate solutions; and
- Reviewing and reporting on progress and performance improvement.

Environmental Performance Goals

The *Environmental Performance Goals for Liquid Waste Services* will provide the framework for setting performance objectives and identifying performance metrics in the following categories:

- Wastewater, residuals and urban drainage;
- Liquid waste infrastructure and operations – resources, materials and waste management;
- Ecological health; and
- Air emissions, energy and climate change.

The *Environmental Performance Goals* are written as a related document to the *Environmental Risk Management Policy* to allow for periodic updates. Many of the goals listed reflect commitments made in existing Metro Vancouver regional plans and will form the basis for future development of environmental performance objectives for each significant environmental risk area.

Next Steps

ISO 14001 requires that this policy be available to the public. Following Board approval, Liquid Waste Services will post its *Environmental Risk Management Policy* at the Metro Vancouver website.

ALTERNATIVES

1. That the GVS&DD Board approve the *Environmental Risk Management Policy for Liquid Waste Services* as presented in the report dated April 29, 2022, titled "Environmental Risk Management Policy for Liquid Waste Services".

2. That the GVS&DD Board receive for information the report dated April 29, 2022, titled "Environmental Risk Management Policy for Liquid Waste Services", and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

The costs associated with developing and implementing the *Environmental Risk Management Policy for Liquid Waste Services* as well as other components of the ISO 14001 EMS standard will continue to be incorporated into GVS&DD operating budgets on an incremental risk priority basis. Any new programs or enhancements to existing programs will be included in the following years budget for consideration by the GVS&DD Board.

CONCLUSION

There is currently no GVS&DD Board policy supporting the utility's environmental practices. Liquid Waste Services staff are developing an Environmental Management System that conforms to ISO 14001. This internationally recognized standard requires an organization to adopt an environmental policy within the defined scope of its EMS. Having an environmental policy is a key foundational ingredient of the ISO approach to meeting regulatory and due diligence requirements, and continually improving environmental performance on a risk priority basis.

The proposed *Environmental Risk Management Policy for Liquid Waste Services* is intended to solidify and formalize the utility's commitments to environmental protection. It commits LWS to implement and maintain an EMS that conforms to ISO 14001, to systematically and proactively identify, prioritize, and manage environmental risks related to the utility's infrastructure and operations.

Attachments

1. Environmental Risk Management Policy for Liquid Waste Services
2. Environmental Performance Goals for Liquid Waste Services

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

BOARD POLICY

ENVIRONMENTAL RISK MANAGEMENT POLICY FOR LIQUID WASTE SERVICES

Effective Date: TBD

Approved By: GVS&DD Board

Policy No. XX-XXX

PURPOSE

This Policy commits Liquid Waste Services to implement and maintain an Environmental Management System (EMS) based on ISO 14001, to systematically and proactively identify, prioritize and manage environmental risks related to the utility's infrastructure and operations to achieve the following outcomes:

- Protect human health and the environment
- Reduce pollutants and greenhouse gases, prevent waste, and conserve natural ecosystems
- Continually improve decision-making to mitigate risks, ensure compliance, increase efficiencies and enhance environmental performance

Achievement of these outcomes will be assessed through continual monitoring and measurement of performance, based on the *Liquid Waste Services Environmental Performance Goals*.

POLICY

Liquid Waste Services commits to integrating environmental principles and performance objectives into all decision-making processes to enhance the environmental performance of the utility. This will be accomplished by developing strategies to protect human health, identify and mitigate potential adverse environmental impacts, protect and enhance the natural environment, prevent pollution, reduce waste generation and improve its management, optimize energy use, and proactively adapt the utility's infrastructure and operations to climate change.

Environmental Risk Management Commitments

Liquid Waste Services commits to the following with respect to planning, design, construction, operations and maintenance of the utility's infrastructure:

- Protect human health and the environment
- Prevent pollution
- Stay abreast of regulatory changes, meet regulatory requirements and other commitments, demonstrate due diligence, and respond to legislative change
- Continually improve the Liquid Waste Services EMS as a mechanism to increase efficiencies and enhance environmental performance in the areas outlined in the *Liquid Waste Services Environmental Performance Goals,* namely:
  - Wastewater, Residuals, and Urban Drainage
  - Liquid Waste Infrastructure and Operations - Resources, Materials, and Waste Management
  - Ecological Health
  - Air Emissions, Energy, and Climate Change

Environmental Management System

An Environmental Management System provides the framework for fulfilling regulatory requirements and other commitments, demonstrating due diligence, and tracking environmental performance. It is a risk-based, systematic, and iterative approach to planning, doing, reviewing, and taking preventative and corrective action.

As part of this approach Liquid Waste Services will:

- Develop and implement an EMS based on ISO 14001
- Determine and document significant environmental risks and related regulatory requirements and other commitments
- Set, prioritize and periodically review performance objectives for all significant priority environmental risk areas considering practicality, feasibility, efficiency, stakeholder impacts, and affordability
- Develop, implement and continually improve operational and maintenance plans, programs, procedures, protocols, and practices, along with training and communications, to enhance performance in the significant priority environmental risk areas
- Incorporate knowledge of potential impacts of identified environmental risks into asset management and capital infrastructure planning
- Provide environmental performance information to staff, and empower them to generate solutions that deliver desirable outcomes
- Regularly report on and review progress in meeting the environmental performance objectives by:
    - Defining and monitoring metrics for the *Liquid Waste Services Environmental Performance Goals*, based on the performance objectives established for the significant environmental risk areas
    - Performing audits of the Environmental Management System or any of its programs

Communication

Liquid Waste Services will ensure the Environmental Risk Management Policy is communicated to all persons governing, or working for or on behalf of the utility.

This Environmental Risk Management Policy is publicly available.

Application

This policy covers all activities Liquid Waste Services controls or influences.

Related Document

Liquid Waste Services Environmental Performance Goals

Environmental Performance Goals
for Liquid Waste Services

The majority of the following environmental performance goals for Liquid Waste Services are aligned with existing Metro Vancouver applicable plans and policies, that are subject to periodic updates. Any corresponding changes to this document, when required to maintain alignment, will be reviewed and approved by the Liquid Waste Services General Manager and Directors.

Goal
Wastewater, Residuals, and Urban Drainage
a) Plan and control operations to return wastewater to the environment in a manner that protects human health and the environment, including reducing wet weather overflows.
b) Strengthen awareness and engagement with the public, member jurisdictions, other orders of government, and key stakeholders for effective, affordable and collaborative management of the regional sewage and drainage system.
c) Reduce liquid wastes and associated contaminants at their source.
d) Use liquid waste as a resource by recovering energy, nutrients, water, or other usable materials in the liquid waste stream that can effectively and efficiently be recovered.
e) Use liquid waste as a resource by maximizing environmentally sound, cost-effective, beneficial uses of biosolids.
f) Use innovative approaches and technologies to protect human health and the environment, including those to address substances of emerging environmental concern; improve wastewater collection, treatment, and residuals management; and implement sustainable stormwater management practices.
g) Reduce adverse environmental impacts and increase the environmental benefits of Liquid Waste Services' infrastructure.
Liquid Waste Infrastructure and Operations - Resources, Materials, and Waste Management
a) Continually improve environmental management practices for procurement, delivery, storage, handling, and efficient use of resources and materials.
b) Plan and control operations to prevent harmful impacts associated with Liquid Waste Services' activities and substances entering the environment, including wastewater, water containing sediments, drinking water, fuels, oils, and other hazardous chemicals or wastes.
c) Continually improve waste management practices to reduce the generation of waste, increase the reuse and recycling of waste, and increase the recovery of materials and energy from remaining waste. Dispose of residual waste products in a cost-effective manner that minimizes environmental impacts.

Environmental Performance Goals
for Liquid Waste Services

Goal
Ecological Health
a) Protect, restore or enhance habitat to improve ecological resilience.
b) Exercise extraordinary care with ecosystems that contain species which are vulnerable or endangered or are critical to living systems.
c) Incorporate the social, economic, cultural, and environmental value provided by ecosystem services into decision making.
d) Control and prevent the spread of invasive species by following invasive species best management practices.
Air Emissions, Energy, and Climate Change
a) Conduct activities to contribute to healthy, clean, and clear air for current and future generations.
b) Advance corporate carbon neutrality in support of becoming a carbon neutral region by 2050 and to achieve interim regional targets.
c) Reduce energy consumption, switch to renewable energy, maximize energy recovery, sequester and remove carbon, and continually improve energy efficiency performance.
d) Strengthen the long-term resilience of the regional liquid waste and urban drainage systems to natural hazards, climate change, and other significant disruptions.

To: Liquid Waste Committee

From: Jeff Carmichael, Division Manager, Business Development, Liquid Waste Services
Marie-Liesse Marc, Director, Major Projects, Project Delivery

Date: May 4, 2022 Meeting Date: May 18, 2022

Subject: **Grant Funding Application for Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project**

RECOMMENDATION

That the GVS&DD Board:

a) support the application for grant funding of $13,400,000 for the Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project to CleanBC Communities Fund, as presented in the report titled "Grant Funding Application for Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project", dated May 4, 2022; and

b) subject to successful grant funding, approve financing of eligible costs until the provincial government contributions are received, and approve funding for any ineligible and potential Project cost overruns.

EXECUTIVE SUMMARY

On January 17, 2022, the governments of Canada and British Columbia committed up to $134 million towards a third intake of the Green Infrastructure – CleanBC Communities Fund, which is part of the federal government's Investing in Canada Infrastructure Program, to support cost-sharing of infrastructure projects in communities across the province. This intake supports projects starting in 2023 and completing by March 2027.

The proposed Northwest Langley Wastewater Treatment Plant Renewable Natural Gas project will reduce regional greenhouse gas emissions and generate ongoing revenues, in support of *Climate 2050* and *Integrated Liquid Waste and Resource Recovery Plan* goals. The Project will install infrastructure that will clean up excess biogas at the new plant, and recover heat from treated effluent to increase excess biogas availability. The cleaned biogas will be sold to FortisBC as renewable natural gas (RNG), for use throughout the region, reducing regional greenhouse gas emissions. This grant application for $13,400,000 from the CleanBC Communities Fund will help fund the design and construction of the Project, which has a total cost of $27.1M, excluding owner's costs and risk reserve.

Endorsement of the Project by the appropriate authorized governing body is recommended.

PURPOSE

To obtain GVS&DD Board endorsement of an application to the CleanBC Communities Fund, to partially fund the design and construction of the Northwest Langley Wastewater Treatment Plant Renewable Natural Gas project.

BACKGROUND

The Northwest Langley Wastewater Treatment Plant, which currently serves 30,000 people in the Township of Langley, is in the process of being expanded to serve 230,000 people, including residents and businesses in the City of Maple Ridge and City of Pitt Meadows. The GVS&DD Board endorsed the Indicative Design for the Northwest Langley Wastewater Treatment Plant at the October 26, 2018 meeting of the GVS&DD Board. If approved, design of the Project will commence in 2023. Construction of the Project is anticipated to be completed by 2027.

The proposed Project will install infrastructure to make use of biogas generated by the treatment process that is not needed for plant operations. Additional infrastructure will be installed to recover heat from treated effluent for use in plant operations, freeing up additional biogas. Excess biogas will be cleaned to pipeline quality and sold to FortisBC as Renewable Natural Gas under a new contract that will be established. The Renewable Natural Gas will be used throughout the region, reducing regional greenhouse gas emissions by approximately 2,400 tonnes per year for the entire project life.

An analysis study was completed in 2018 and early design analysis has continued since that time. The Project will contribute to Metro Vancouver's *Climate 2050* goals and aligns with the *Board Strategic Plan* and *Integrated Liquid Waste and Resource Management Plan*.

The CleanBC Communities Fund is a collaboration between the B.C. Ministry of Municipal Affairs and Housing and the Ministry of Environment and Climate Change Strategy. The fund is a component of the B.C. government's CleanBC plan, which strives to push British Columbia to a cleaner, better future with a low carbon economy that creates opportunities for all while protecting our clean air, land and water. The fund will provide funding for infrastructure projects that support the management of renewable energy, access to clean transportation, improved energy efficiency of buildings and the generation of clean energy.

FUNDING REQUEST

The Project grant application to the CleanBC Communities Fund is to partially fund the design and construction tentatively planned to commence in 2023. Staff estimate the total cost of the project to be $27.1 million, excluding owner's costs and risk reserve. If Metro Vancouver receives the grant, GVS&DD is required to commit to and fund remaining costs and any potential overages.

ALTERNATIVES

1. That the GVS&DD Board:
   a) support the application for grant funding of $13,400,000 for the Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project to CleanBC Communities Fund, as presented in the report titled "Grant Funding Application for Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project", dated May 4, 2022; and
   b) subject to successful grant funding, approve financing of eligible costs until the provincial government contributions are received, and approve funding for any ineligible and potential Project cost overruns.

2. That the GVS&DD Board receive for information the report dated May 4, 2022, titled "Grant Funding Application for Northwest Langley Wastewater Treatment Plant Renewable Natural Gas Project" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the GVS&DD Board approves Alternative 1, the funds included in the Liquid Waste Capital Budget will be used as Metro Vancouver's contribution toward the Project. The overall expenditures for the Project are included in the Liquid Waste Capital Budget and any grant received from the CleanBC Communities Fund will offset future expenditures for the project. The Fund allows for up to 73.33% of the Project's eligible costs to be reimbursed, up to 10% of the total value of the fund, but does not allow cost overrun or costs incurred past March 31, 2027 to be reimbursed.

As such, if the Application is successful, Metro Vancouver will be required to:

- Finance the Project's eligible costs (currently estimated at $13,400,000) until associated federal and provincial government contributions are received;
- Fund any ineligible costs (remaining cost of the project) and potential cost overruns associated with the Project.

If the grant is received, the project is expected to pay for itself within the first five years of operation, because the project avoids the need to build other infrastructure. The project has a positive net present value of $16 million over a twenty-five year project life.

If the GVS&DD Board approves Alternative 2, there will be no financial implications.

CONCLUSION

Planning has begun for the Project, which will create revenues and reduce regional emissions. An opportunity has arisen to request funding to partially fund and advance the project from the CleanBC Communities Fund. A requirement of the grant application is a resolution from the approving body supporting this project.

Staff recommend Alternative 1.

51721382

To: Water Committee and Liquid Waste Committee

From: Roy Moulder, Director, Procurement, Procurement and Real Estate Services
Bryan Shoji, Director, Wastewater Treatment & Residuals Management, Liquid Waste Services
Andrew de Boer, Acting Director, Operations & Maintenance, Water Services

Date: April 28, 2022 Meeting Dates: May 11, 2022
May 18, 2022

Subject: **Award of Contract Resulting from Request for Proposal No. 22-015: Supply and Delivery of Sodium Hypochlorite**

RECOMMENDATION

That the GVWD and GVS&DD Boards:

a) approve award of a contract for an estimated value of $11,992,000 (exclusive of taxes) to Brenntag Canada Inc., for an initial 3-year term, resulting from Request for Proposal No. 22-015: Supply and Delivery of Sodium Hypochlorite, subject to final review by the Commissioner; and
b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

EXECUTIVE SUMMARY

Sodium hypochlorite is used by Water Services for drinking water disinfection at the Seymour Capilano Filtration Plant, Coquitlam Water Treatment Plant, and the secondary disinfection facilities. Liquid Waste Services uses sodium hypochlorite for effluent disinfection at the Annacis Island, Lions Gate, and Lulu Island Wastewater Treatment Plants.

Two proposals were received in response to Request for Proposal (RFP) No. 22-015: Supply and Delivery of Sodium Hypochlorite. Brenntag Canada Inc. (Brenntag) was identified as offering the best proposal based on technical evaluation and offered the lowest unit rates where comparison was possible. Based on the evaluation of the proposals, it is recommended that a contract be awarded to Brenntag. The term of the Agreement is 3 years with an option to extend for one additional 2-year term as mutually agreed by the parties. The 3-year term has an estimated value of $11,992,000 excluding taxes. The 5-year term, if extended, will have a maximum value of $23,076,000 excluding taxes. The Agreement will commence on July 1, 2022.

PURPOSE

This report is to advise the GVWD and GVS&DD Boards of the results of RFP No. 22-015: Supply and Delivery of Sodium Hypochlorite and to recommend award of a 3-year contract for an estimated value of $11,992,000 (exclusive of taxes) to Brenntag Canada Inc.

BACKGROUND

Pursuant to the *GVWD and GVS&DD Officers and Delegation Bylaws No. 247, and 284, 2014 (Bylaws)* and the *Procurement and Real Property Contracting Authority Policy (Policy)*, procurement contracts

which exceed a value of $5 million require the approval of the GVWD and the GVS&DD Board of Directors.

This report is being brought forward to the Water Committee and the Liquid Waste Committee to consider a recommendation to the GVWD and GVS&DD Boards to authorize award of a contract for Supply and Delivery of Sodium Hypochlorite.

SUPPLY REQUIREMENTS

Sodium Hypochlorite is a key component in the treatment of drinking water and is utilized by Water Services (WS) at the Seymour Capilano Filtration Plant (SCFP), Coquitlam Water Treatment Plant (CWTP) and the secondary disinfection facilities of the Greater Vancouver Water District. Liquid Waste Services (LWS) uses sodium hypochlorite for effluent disinfection at the Annacis Island, Lions Gate, and Lulu Island Wastewater Treatment Plants (AIWWTP, LGWWTP, and LIWWTP) of the Greater Vancouver Sewerage and Drainage District. AIWWTP also uses sodium hypochlorite in conjunction with caustic soda to control odours. The continuous uninterrupted supply of sodium hypochlorite is critical for treatment of both drinking water and wastewater.

EVALUATION

RFP No. 22-015 was issued and closed on February 14, 2022. The RFP contemplated an initial term of three years with an option to extend for an additional two years upon mutual agreement between parties. Two proposals were received and determined to be compliant. The RFP allowed for issuing a single contract for the supply for WS and LWS facilities, or issuing multiple contracts, based on what would be most advantageous to the Corporation. Proposals were evaluated based on 40% technical and 60% financial. Due to the criticality of this chemical supply the evaluation considered risk mitigation and the ability of the proponents to maintain supply to the Corporation's facilities. Both proponents identified local manufacturing facilities to alleviate possible supply chain issues. The technical component of the proposals was evaluated by staff from both WS and LWS, while the financial component was evaluated by a representative from Procurement and Real Estate Services. Based on the technical and financial criteria Brenntag Canada Inc. was ranked highest.

Table 1: Proposal Pricing Summary

Proponent		**Projected Costs over 3-Year Term (exclusive of taxes)**		
		Bulk	**Non-Bulk**	**Total**
Brenntag Canada Inc.	Water Services	$6,349,000	$1,114,000	$7,463,000
	Liquid Waste Services	$4,370,000	$159,000	$4,529,000
	TOTAL:			$11,992,000
ClearTech Industries Inc.	Water Services	N/A	$1,538,000	N/A
	Liquid Waste Services	N/A	$220,000	N/A

A summary of the 3-year term proposal pricing is shown in Table 1. Bulk sodium hypochlorite is delivered using tanker trucks to WS and LWS facilities, in quantities of 20,000 L or greater. Non-bulk sodium hypochlorite is delivered in smaller loads of 2,000 – 8,000 litres to the secondary disinfection facilities or as top-up loads to the main facilities. If extended for a 5-year term, the contract will have

a maximum value of $23,076,000 excluding taxes. This maximum value includes the expected increased chemical purchases and anticipated price escalations over the 5-year term.

It is recommended to award one contract as Brenntag provided the lowest pricing on the non-bulk and was the only proponent that offered bulk pricing.

ALTERNATIVES

1. That the GVWD and GVS&DD Boards:
   a) approve award of a contract for an estimated value of $11,992,000 (exclusive of taxes) to Brenntag Canada Inc., for an initial 3-year term, resulting from Request for Proposal No. 22-015: Supply and Delivery of Sodium Hypochlorite, subject to final review by the Commissioner; and
   b) authorize the Commissioner and the Corporate Officer to execute the required documentation once the Commissioner is satisfied that the award should proceed.

2. That the GVWD and GVS&DD Boards terminate Request for Proposal No. 22-015: Supply and Delivery of Sodium Hypochlorite, and direct staff to report back to the GVWD and GVS&DD Boards with options for an alternate course of action.

FINANCIAL IMPLICATIONS

If the GVWD and GVS&DD Boards approve Alternative 1, a contract will be awarded to Brenntag Canada Inc. in the amount of $11,992,000 (exclusive of taxes) to supply the chemicals as and when needed. This amount is within the operating budgets of the facilities. The proposal from Brenntag Canada Inc. was identified as offering best overall value, including the most cost effective pricing. Rates for the optional 2-year extension would be negotiated at time of renewal.

The GVWD and GVS&DD Boards have the choice not to proceed with Alternative 1, but staff will need further direction in relation to the project. Alternative 2 could disrupt the continuation of sodium hypochlorite supply to the water and wastewater treatment plants.

CONCLUSION

Request for Proposal No. 22-015 was issued for the supply and delivery of both bulk and non-bulk volumes of sodium hypochlorite and Brenntag was identified as the highest ranked proponent with the lowest pricing. Based on the evaluation of the proposals, it is recommended that the GVWD and GVS&DD Boards authorize the Commissioner and corporate Officer to award and execute a 3-year contract with Brenntag Canada Inc., for the unit rates provided in their proposal in an estimated contract value of $11,992,000 (excluding taxes).

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To: Liquid Waste Committee

From: Peter Navratil, General Manager, Liquid Waste Services

Date: May 10, 2022 Meeting Date: May 18, 2022

Subject: **Manager's Report**

RECOMMENDATION
That the Liquid Waste Committee receive for information the report dated May 10, 2022 titled "Manager's Report".

1. North Shore Wastewater Treatment Plant Update

PCL Constructors Westcoast Inc., the new designated Prime Contractor for the North Shore Wastewater Treatment Plant project, was assigned care and control of the project site on April 1, 2022. PCL has implemented a new site safety plan and filed notice of the project with WorkSafe BC. The process of transferring technical information to PCL is underway. They have integrated with the AECOM design team (including co-location in the site and design offices) and have started work on developing an execution plan to complete the project, including budget and schedule estimating. In tandem with these activities, AECOM's work on development of the detailed design continues to progress. Design and contract preparation to allow PCL to proceed with early work (e.g. concrete) is also in progress.

Transition meetings with Project Co. continued throughout April, and final project transition activities are targeted to conclude in late May. The project team also held meetings with the District of North Vancouver regarding permitting, and coordination of construction and development activities.

2. Metro Vancouver Laboratory Provides Reliable and High Quality Analytical Services to the Region

The Metro Vancouver Laboratory successfully underwent another assessment of technical competence and renewed its Certificate of Accreditation with the Canadian Association for Laboratory Accreditation (CALA). An accredited laboratory has recognition of competence to manage and perform specific tests. CALA is a national organization which accredits various chemical, physical and microbiological testing methods in accordance with an international ISO/IEC 17025 standard. The accreditation process includes site visit assessment by a team of professionals drawn mostly from member laboratories or from regulatory agencies and authorities having jurisdiction within the public sector. Among other conditions for maintaining CALA accreditation, a laboratory must undergo a bi-annual assessment of conformance with stringent quality management and performance standards.

The Certificate of Accreditation (Attachment 1), originally granted to Metro Vancouver Laboratory in 1995, demonstrates technical competence for a defined scope and the operation of a laboratory quality management system. It attests to the ability to consistently produce reliable analytical results and provides assurance of quality to regulators and laboratory customers.

Liquid Waste Services Chemistry and Process Laboratory currently perform over 200,000 analytical tests per year. Results are used for monitoring of drinking water and wastewater quality, treatment plant compliance monitoring and process control. Laboratory customers include Metro Vancouver member municipalities, Liquid Waste Services including Source Control, Residuals Management, and Utility Innovation, Water and Solid Waste Services, Environmental Regulation & Enforcement and Metro Vancouver Parks. In order to maintain its credibility with regulators and customers, Metro Vancouver Laboratory is scheduled for the next CALA assessment in 2023.

3. Iona Island Wastewater Treatment Plant and Iona Beach Regional Park Tour – May 4, 2022

On Wednesday, May 4, staff provided a tour of Iona Island Wastewater Treatment Plant and Iona Beach Regional Park to 11 members of the Liquid Waste, Regional Parks and Climate Action Committees, including Vice Chair Dominato, Director Calendino and Councillor Loo. The tour provided participants with a look ahead to the treatment plant upgrade, integration with the park, and the ecological restoration projects, integral components of the Iona Island Wastewater Treatment Plant Projects. Tour photos appear in Attachment 2. A second tour for members of the same committees will be held July 27, 2022, combined with an opening ceremony for Iona's Biosolids Dewatering Facility, an important first step in helping to prepare the site for the plant upgrade and ecological projects.

4. Liquid Waste Committee 2022 Work Plan

The updated 2022 Work Plan (Attachment 3) shows the status of the Committee's key priorities for the year.

Attachments
1. Certificate of Accreditation with the Canadian Association for Laboratory Accreditation
2. Photos from the Iona Tour on May 4, 2022
3. Liquid Waste Committee 2022 Work Plan

ATTACHMENT 1

Canadian Association for Laboratory Accreditation Inc.

CALA

Certificate of Accreditation

Metro Vancouver - Quality Control Laboratory
Metro Vancouver
1299 Derwent Way
Delta, British Columbia

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Accreditation No.: 1002749
Issued On: 1/25/2022
Accreditation Date: 1/3/2005
Expiry Date: 7/25/2024

Acting President and CEO

CALA

ATTACHMENT 2

ATTACHMENT 3

Liquid Waste Committee 2022 Work Plan
Report Date: May 18, 2022

Priorities	
1st Quarter	**Status**
2021 Microfibres "The Ocean Thanks You" Campaign Results	Complete
2021 Fats, Oil and Grease Campaign Results	Complete
Northwest Langley Wastewater Treatment Plant Project Update	Complete
North Shore Wastewater Treatment Plant Project Update	Complete
Development Cost Charge Review Process and Rate Amending Bylaw	Complete
Iona Island Wastewater Treatment Plant Projects - Project Definition Engagement Results	Complete
Iona Island Wastewater Treatment Plant Projects - Project Definition and Conceptual Design	Complete
GVS&DD Trucked Liquid Waste Bylaw Amendment	Complete
2022 Liquid Waste - Sustainability Innovation Fund Applications	Complete
Municipal Requests for Sewerage Area Boundary Amendments (as applicable)	Complete
Utility Policies (as applicable)	Complete
Contract Approvals – Contracts > $5M (as applicable)	Complete
Project Delivery Capital Portfolio Update	Complete
Sewer and Effluent Heat Recovery Bylaw	Complete
Iona Island Land Tenure and License Agreements	Complete
Liquid Waste State of Assets Report	Complete
2nd Quarter	
Liquid Waste Services Capital Program Expenditures Update as at Dec 31, 2021	Complete
Northwest Langley Wastewater Treatment Plant Project Design Update	In Progress
Integrated Liquid Waste and Resource Management Plan: Report on Phase 1	Complete
Sewage Catchment Area (Rawn) Amendments	In Progress
2021 GVS&DD Environmental Management and Quality Control Annual Report	In Progress
LWS Environmental Management System Policy	In Progress
Liquid Waste Services Environmental Risk Management Report	In Progress
Proposed Capital Investment and Carbon Accounting Processes For Sewer Heat Recovery Projects	In Progress
Liquid Waste Heat Recovery Policy	In Progress
2022 Update on Liquid Waste Sustainability Innovation Fund Projects	In Progress
Municipal Requests for Sewerage Area Boundary Amendments (as applicable)	In Progress
Utility Policies (as applicable)	In Progress
Contract Approvals – Contracts > $5M (as applicable)	In Progress
3rd Quarter	
Liquid Waste Services Capital Program Expenditures Update as at April 30, 2022	Pending
2022 Unflushables Campaign Results	Pending
Food Sector Bylaw Review	Deferred to 2023
Sustainability Innovation Fund Project Update	Pending
Municipal Requests for Sewerage Area Boundary Amendments (as applicable)	Pending
Utility Policies (as applicable)	Pending
Contract Approvals – Contracts > $5M (as applicable)	Pending

4th Quarter	Status
Liquid Waste Services Capital Program Expenditures Update as at August 31, 2022	Pending
Annual Budget & 5 Year Financial Plan - Liquid Waste	Pending
Annacis Outfall Construction Update	Pending
Drainage Areas Facility Policy	Pending
Estuary Management Program Update	Pending
Municipal Requests for Sewerage Area Boundary Amendments (as applicable)	Pending
Utility Policies (as applicable)	Pending
Contract Approvals – Contracts > $5M (as applicable)	Pending

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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Liquid Waste Committee

From: Lillian Zaremba, Program Manager, Collaborative Innovation, Liquid Waste Services

Date: April 20, 2022 Meeting Date: May 18, 2022

Subject: **2022 Update on Liquid Waste Sustainability Innovation Fund Projects**

The attached report dated April 20, 2022 titled "2022 Update on Liquid Waste Sustainability Innovation Fund Projects" is being presented to the Climate Action Committee for information at its May 13, 2022 meeting. The report is presented to the Liquid Waste Committee for its information only.

Attachment
"2022 Update on Liquid Waste Sustainability Innovation Fund Projects", dated April 20, 2022

To: Climate Action Committee

From: Lillian Zaremba, Program Manager, Collaborative Innovation, Liquid Waste Services

Date: April 20, 2022 Meeting Date: May 13, 2022

Subject: **2022 Update on Liquid Waste Sustainability Innovation Fund Projects**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated April 20, 2022, titled "2022 Update on Liquid Waste Sustainability Innovation Fund Projects."

EXECUTIVE SUMMARY

This report provides an update on eight projects that were approved for funding in 2017 through 2021 under the Sustainability Innovation Fund. Of the eight projects, two are highlighted for significant milestones:

- Genomics Approach to Anaerobic Digestion Optimization. The United States Patent and Trademark Office granted a patent titled "Syntrophic Enrichment for Enhanced Digestion Processes" to Metro Vancouver in March 2022.
- Hydrothermal Processing – Biofuel Demonstration Facility. The contract for design of the hydrothermal processing unit was awarded in January 2022.

Descriptions of the other six projects that are progressing are included in the Attachment.

PURPOSE

This report provides an update on projects funded under the Liquid Waste Sustainability Innovation Fund.

BACKGROUND

The Liquid Waste Sustainability Innovation Fund (the Fund) was created by the Board in 2004 to provide financial support to Liquid Waste Utility projects that contribute to the region's sustainability. The GVS&DD Board adopted the *Liquid Waste Sustainability Innovation Fund Policy* on June 27, 2014, with further amendments in 2016 and 2021, to guide the use and management of the Fund. The policy requires that the Climate Action Committee be updated on an annual basis on the deliverables, outcomes and measurable benefits of the projects receiving funding.

This report presents an update on projects that have not yet been reported as complete to the Climate Action Committee. The projects outlined below were approved for funding from 2017 to 2021. No new project proposals were submitted or approved in 2021; however, the previously approved Hydrothermal Processing - Biofuel Demonstration Facility received additional funding in February 2021 as identified below.

STATUS OF SUSTAINABILITY INNOVATION PROJECTS (APPROVAL YEARS: 2017 – 2021)

Project	Approval Year	Amount Approved	Status
High Efficiency Aeration Demonstration	2017	$750,000	In Progress
Genomics Approach to Anaerobic Digestion Optimization	2017	$460,000	Complete
Intelligent Water Systems - Making Use of Sensors and Big Data Analytics	2018	$200,000	In Progress
Hydrothermal Processing - Biofuel Demonstration Facility	2018 2021	$8,250,000 $6,130,000	In Progress
Multiphase Composite Coating (MCC) for Concrete Sewers	2019	$620,000	In Progress
Pump Station Optimization	2019	$330,000	In Progress
Advanced Resource Recovery from Sludge: Industrial Research Chair Program	2019	$2,985,000	In Progress
Handheld Wastewater Microbial DNA Monitor	2020	$330,000	In Progress

Genomics Approach to Anaerobic Digestion Optimization: Complete
The goal of this project is to identify a means to increase biomethane generation from existing anaerobic digestion processes at Metro Vancouver wastewater treatment plants. There were two academic teams on this project: i) environmental genomic experts at UBC Department of Microbiology and Immunology, and ii) anaerobic digestion experts from UBC School of Engineering, within the Bioreactor Technology Group.

Outcomes:
- Secured federal academic grants totaling over $700,000.
- Genomic sequencing of the microbiome provided insights for the invention of a compact add-on reactor to boost renewable natural gas production from existing digesters.
- The UBC team successfully tested a lab-scale prototype of the reactor for enhanced digestion.
- Creation of intellectual property. The United States Patent and Trademark Office granted a patent titled “Syntrophic Enrichment for Enhanced Digestion Processes” to Metro Vancouver in March 2022 and an international patent application is pending.

Hydrothermal Processing – Biofuel Demonstration Facility: In Progress
The goal of this project is to design, fabricate, and operationalize a hydrothermal processing demonstration facility at the Annacis Island Wastewater Treatment Plant. Compared to the current anaerobic digestion process, the hydrothermal processing technology promises a smaller footprint, reduced net costs, and production of biocrude that can be refined to low-carbon transportation fuels, include marine biofuel, sustainable aviation fuel, and biodiesel.

Outcomes to Date:
- Preliminary design completed in 2020.
- Contractor retained for design, fabrication, delivery and commissioning of the hydrothermal processing unit.

Milestone:
- The design of the hydrothermal processing unit was awarded in January 2022.

Next steps involve completing the detailed design and awarding the fabrication phase of the hydrothermal processing unit.

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

FINANCIAL IMPLICATIONS
The projects summarized in this report had funding approved by the GVS&DD Board from 2017-2021. The disbursals of funds were made in accordance with the applicable *Sustainability Innovation Fund Policy* that governs the use and management of the Funds.

The table below outlines the funding approved and the amount spent to date for each project. Any unspent funds for completed projects remain in the Sustainability Innovation Fund reserve.

Project	Total Amount of Funding Approved	Est. Spent (as of Mar. 31, 2022)
2017 Approval Year		
High Efficiency Aeration Demonstration	$750,000	$124,481
Genomics Approach to Anaerobic Digestion Optimization	$460,000	$402,705
2018 Approval Year		
Intelligent Water Systems - Making Use of Sensors and Big Data Analytics	$200,000	$184,562
Hydrothermal Processing - Biofuel Demonstration Facility	$8,250,000 $6,130,000	$1,099,300
2019 Approval Year		
Multiphase Composite Coating (MCC) for Concrete Sewers	$620,000	$137,618
Pump Station Optimization	$330,000	$195,043
Advanced Resource Recovery from Sludge: Industrial Research Chair Program	$2,985,000	$953,528
2020 Approval Year		
Handheld Wastewater Microbial DNA Monitor	$330,000	$88,750

The balance in the Liquid Waste Sustainability Innovation Fund at Dec. 31, 2021 was $18.8 million.

CONCLUSION
This report presented an update on eight projects funded under the Liquid Waste Sustainability Innovation Fund. The Fund was created by the Board in 2004 to provide financial support to Liquid Waste Utility projects that contribute to the region's sustainability.

Attachment
Update on other Liquid Waste Sustainability Innovation Fund Projects in Progress

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UPDATE ON OTHER LIQUID WASTE SUSTAINABILITY INNOVATION FUND PROJECTS IN PROGRESS

High Efficiency Aeration Demonstration: In Progress
Aeration is energy-intensive – it can consume more than half of the energy required by a wastewater treatment plant. This project will assess the performance at pilot scale of the Perlemax Fluidic Oscillator, a new device that has shown its ability to improve aeration energy efficiency by 25% in small tanks. Project partners are the District of Columbia Water and Sewer Authority (DC Water), where the testing will be conducted, and the Water Research Foundation (WRF), who are coordinating a third-party independent validation.

Outcomes to Date:

- Perlemax delivered a preliminary design of their system for testing at DC Water.
- WRF assembled an expert independent evaluation panel.
- Finalized contract with DC Water to construct and test the pilot.
- Detailed design of pilot aeration tank approved by all project partners.

Testing is scheduled to begin in late 2022.

Intelligent Water Systems – Making Use of Sensors and Big Data Analytics: In Progress
Metro Vancouver and its member jurisdictions monitor and collect large amounts of data. As increasing numbers of less expensive sensors are deployed, the volume of data is expected to increase exponentially. The purpose of this project is to identify and evaluate innovative tools and techniques to help regional and municipal liquid waste utilities create information from the wave of "Big Data" that is transforming the industry. The project partner is the Water Research Foundation (WRF).

Outcomes to Date:

- In partnership with the WRF, a consultant has been retained to explore how Big Data techniques can be unified and leveraged with artificial intelligence to enable predictions, adapt operational rules, schedule maintenance and the like. Other considerations include integration of databases for precipitation, land use, population, and environmental monitoring.

Next steps involve working with the consultant using Metro Vancouver as a case study.

Multiphase Composite Coating (MCC) for Concrete Sewers: In Progress
The overall goal of this project is to field test and validate the performance of a new coating material developed by UBC with the potential to protect both new and existing concrete sewer pipes from biological corrosion, which can dramatically reduce the service life of sewer networks and result in significant repair and replacement costs. The project partners are UBC's Department of Civil Engineering, Ocean Pipe, and Metro Testing & Engineering.

Outcomes to Date:

- Laboratory testing of coating material in progress at UBC.

- A spray-on version of the coating is under development at UBC with plans for piloting on a small scale rehabilitation project.
- An NSERC proposal was submitted by UBC in December 2021 for additional funding to further develop the spray placement of the MCC coating using robotics and artificial intelligence.
- Field and laboratory testing is progressing on the pilot application of the coating material in a heavily corroded concrete sewer chamber in Delta. Physical, chemical and mechanical properties of the coating are currently being evaluated and showing positive results.

Milestone:

- Significant laboratory work has been done on the yield stress and viscosity of the material to allow the coating to be sprayed more effectively, increasing its potential for commercial viability. This represents a major jump in the development of this coating material.

Performance testing of the pilot application will continue into 2023.

Pump Station Optimization: In Progress

The goal of this project is to investigate opportunities to improve wet weather system performance and save energy by adjusting operating strategies at sanitary pump stations. Metro Vancouver's 33 pump stations consume electricity that costs approximately $2.4 million per year. This project is a partnership with the UBC Sauder School of Business involved in the field of Operations Research.

Outcomes to Date:

- Advanced modelling and new operational controls for Metro Vancouver's Lynn Pump Station in the North Vancouver indicate a potential 25% reduction in energy use.
- COVID-related priorities, facility lock-downs, and operational restrictions suspended work in 2020 and 2021.
- The UBC collaboration effort was discontinued in 2021 due to the closure of UBC's industry partnership program.

A trial of the amended control strategy for the Lynn Pump Station is scheduled for 2022.

Advanced Resource Recovery from Sludge: In Progress

The main goals of this 5-year project are: i) assess the integration of hydrothermal and anaerobic digestion processes and characterize the potential for nitrogen and phosphorus recovery, ii) evaluate the effectiveness of hydrothermal processing in destroying a wide range of micropollutants, iii) develop a prototype and pilot-scale bioreactor that can augment biomethane production. Advancing the recovery of resources from wastewater to produce value-added output for use by other industries can help build a stronger circular economy. The project partners are UBC School of Engineering and the Natural Sciences and Engineering Research Council.

Outcomes to Date:

- UBC successfully tested a wide range of configurations and identified the optimal arrangement for integrating hydrothermal processes and anaerobic digestion.
- UBC's prototyping provided valuable insights for bioreactor scoping and design at the pilot scale.

Next steps include developing a method to detect and quantify the fate of prioritized compounds of environmental concern through hydrothermal processes.

Handheld Wastewater Microbial DNA Monitor: In Progress

The goal of this project is to adapt an off-the-shelf DNA sequencer to test the microbes in wastewater samples taken from treatment processes, which will provide quantitative results to support existing visual assessments. Combined with the development of artificial intelligence, this system could provide early warning of treatment process upsets, allowing greater time to take corrective action and prevent process failure.

Outcomes to Date:

- UBC entered into a Collaborative Research Agreement and kicked off research in 2021.
- UBC researchers began collecting wastewater samples at Annacis Island WWTP to develop and validate the DNA extraction method, with promising initial results.

Full scale testing will begin in 2022.

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