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SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Regional Culture Committee

From: Sarah Faucher, External Outreach Coordinator, External Relations Department

Date: June 1, 2021 Meeting Date: June 23, 2021

Subject: **Metro Vancouver Regional Culture Project Grants: Adjudication Process**

RECOMMENDATION

That the Regional Culture Committee receive for information the report dated June 1, 2021, titled "Metro Vancouver Regional Culture Project Grants: Adjudication Process".

EXECUTIVE SUMMARY

Metro Vancouver's annual regional culture project grants, funded from the Cultural Grants Reserve, support region-serving arts and culture projects. Similar to the 2020 grants, the allocation of this year's grants will factor in additional considerations related to COVID-19 impacts and adapted project delivery resilient to evolving public health measures. Staff will undertake an initial review of all received applications and present shortlisted applications for adjudication by the Committee. At the July 21, 2021 meeting, applications will be discussed and a recommendation will be made on the grant award for each successful proponent to a cap of $10,000 per project. As part of Metro Vancouver's restart and recovery support from the Province of BC's "COVID-19 Safe Restart Grant for Local Governments", the 2021 Regional Culture Project Grants include a one-time increase of $150,000 for a total disbursement of $300,000. The Committee's recommended allocations will be presented to the July 30, 2021 MVRD Board meeting for final approval.

PURPOSE

To provide the Regional Culture Committee with guidelines for reviewing the 2021 grant applications that will result in the recommended allocation of the annual Regional Culture Project Grants.

BACKGROUND

As part of its Terms of Reference, the Regional Culture Committee has direct responsibility for the review and adjudication of the annual regional culture project grant applications, to recommend the grant allocations to the MVRD Board for approval. This report is brought forward to review the adjudication process.

In 2020, Metro Vancouver awarded $140,000 in Regional Culture Project Grants to 29 organizations, ranging in value between $1,500 and $8,000.

METRO VANCOUVER REGIONAL CULTURE PROJECT GRANTS: ADJUDICATION PROCESS

2021 Intake and Review of Applications

The 2021 Metro Vancouver regional culture project grants were announced April 6, 2021 through a media release (Attachment 1). Social media channels, the April 2021 issue of Metro Vancouver's online newsletter, the *Metro Vancouver Update*, and a curated mailing list were used to promote the

grant program and remind potential applicants of the deadline (Attachment 2). Following the May 10 deadline, staff have been processing and logging all received applications, undertaking a pre-screening to ensure each application meets the grant criteria, and creating a shortlist of applications for review and discussion by the Committee.

Committee members will be given a set of score sheets for use in their final assessment based on the guidelines of the regional cultural project grant program (Attachment 3). The adjudication criteria assess organizations' and proposed projects' regional impact, merit, and budget plan, also evaluating proposed timing and additional considerations for reasonably incorporating COVID-19-related adjustments. Staff will provide Regional Culture Committee members spreadsheets of all 2021 applications and of past recipients of Metro Vancouver's regional culture project grants from 2011 - 2020 in order to provide additional background for 2021's allocation decision process. Committee members will receive the shortlisted applications, score sheets, and spreadsheets to review in advance of the July 21, 2021 allocation meeting. Non-shortlisted applications will also be available for possible consideration.

Recovering from COVID-19 Impacts

The COVID-19 pandemic has had a profound effect on the arts and culture sector, and 2021's grant application intake shattered previous records in both the number of applications received as well as the total amount of funds requested overall. Similar to the 2020 grants, the allocation of the 2021 grants will incorporate additional considerations related to COVID-19 impacts, such as adapted project delivery options resilient to evolving public health orders. In addition to $150,000 budgeted from the Cultural Grants Reserve, the 2021 grant disbursement includes a one-time increase of $150,000 for a total disbursement of $300,000 for the Regional Culture Project Grants. The additional monies are from part of the Provincial funding received to support restart and recovery efforts through the "COVID-19 Safe Restart Grant for Local Governments".

July 21, 2021 Regional Culture Committee Meeting

At the July 21, 2021 meeting, Regional Culture Committee members ("adjudicators") will discuss each shortlisted application and make a recommendation on the grant award for each of the successful proponents with a cap of $10,000 for each project and the total of all grants not to exceed $300,000. Final reports from previous grants will also be considered if an organization has applied in the past and was successful. Staff will provide an update of the status of final reports from previous years.

Staff will prepare a report based on the recommendations of the Regional Culture Committee to be presented to the MVRD Board for approval at its July 30, 2021 meeting.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The MVRD Cultural Grants program is funded from the Cultural Grants Reserve. The 2021 allocation from the Cultural Grants Reserve is $150,000.

To help address the challenges and fiscal impacts of COVID-19, the Province of BC provided the Metro Vancouver Regional District a total of $3,801,000 in funding to support restart and recovery initiatives. Combining $150,000 from the Cultural Grants Reserve with $150,000 from the Provincial "COVID-19 Safe Restart Grant for Local Governments", a total of $300,000 in 2021 project grants will support regional arts and culture.

CONCLUSION

The allocation of the 2021 Metro Vancouver regional culture project grants will be adjudicated by the Regional Culture Committee and will provide continued support to organizations with a long-standing commitment to serving the region while fostering new recipient organizations committed to expanding to a regional audience. Recognizing the pandemic's devastating impacts on the arts and culture sector, the 2021 grant disbursement includes $150,000 funded annually through the Cultural Grants Reserve and a one-time increase of $150,000 through the Provincial "COVID-19 Safe Restart Grant for Local Governments" for a total of $300,000. Capped at $10,000 per project, the allocation of grants will factor in considerations related to project delivery resilient to evolving public health orders. Staff will undertake initial review of all applications and present shortlisted applications for adjudication by the Committee. A report outlining the Committee's recommendations will be presented to the July 30, 2021 meeting of the MVRD Board for approval.

Attachments:

1. Media Release: "$150K in Cultural Grants – Apply by May 10", issued April 6, 2021
2. Sample mailing list notice – deadline reminder dated May 4, 2021
3. 2021 Metro Vancouver Regional Cultural Project Grant Application Score Sheet

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MEDIA RELEASE

$150K IN CULTURAL GRANTS – APPLY BY MAY 10

Metro Vancouver is accepting submissions for its annual regional cultural grants.

A total of $150,000 in funding assistance is available to arts and culture organizations for regional projects, with a maximum of $10,000 per project grant. These annual grants support region-serving arts and culture projects including creation, production, dissemination, audience development, research, project staff and administrative capacity building.

“As demonstrated by last year’s grant submissions and awards, our region’s arts community is resilient and endlessly creative,” said Sav Dhaliwal, Chair of the Metro Vancouver Board of Directors. “We are pleased to support arts organizations in finding new ways to reach and enrich the lives of residents, while also staying within ongoing public health orders.”

Completed applications must be submitted by 4:00 p.m. on **Monday, May 10, 2021.**

The 2021 application form, project grant eligibility and selection criteria is available at

www.metrovancouver.org/cultural-grants.

Questions may be directed by email to Sarah Faucher, External Outreach Coordinator at

CulturalGrants@metrovancouver.org or 604-456-8828.

Media contact:
Greg Valou, Communications Specialist, c. 778.558.0101

Sarah Faucher

From: Metro Vancouver <CulturalGrants@metrovancouver.org>
Sent: Tuesday, May 4, 2021 9:46 AM
To: Sarah Faucher
Subject: Reminder: Metro Vancouver's 2021 Regional Cultural Project Grants - Apply by May 10

$150k in Cultural Grants – Apply By May 10

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2021 Regional Cultural Project Grant Application Score Sheet

Organization: _____ Project Title: _____

Regional Impact (30%) • Uniqueness of the project in its offering to the regional arts and culture landscape. • Potential number of regional participants impacted/reached with this project. • Is the project region-serving and going to be presented beyond a single municipality? ***Comments:***	***/ 30***
Merit (40%) • Merit of the project, based on past excellence and proven ability of the applicant. • Clearly communicated project goals and relevance to arts and culture in the region. • Measurable success. • Demonstrated community support/involvement. • Project delivery anticipates COVID-19-related considerations to adhere to ongoing public health measures, with resilience to reasonably adjust as necessary. ***Comments:***	***/ 40***
Budget Plan (30%) • Clear and concise budget plan for reasonable use of grant funding. • Other sources of realistic funding support identified and/or in place. • Budget plan reasonably incorporates COVID-19 impacts to revenues and funding. • Requested funds are specific to the proposed project, and are not intended for ongoing operational/general funding. ***Comments:***	***/ 30***
General Comments	***TOTAL SCORE*** ***/ 100***

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To: Performance and Audit Committee

From: Joe Sass, Director Financial Planning and Operations/Deputy CFO

Date: June 1, 2021 Meeting Date: July 7, 2021

Subject: **Capital Program Expenditure Update as at April 30, 2021**

RECOMMENDATION

That the Performance and Audit Committee receive for information the report dated June 1, 2021 titled "Capital Program Expenditure Update as at April 30, 2021".

EXECUTIVE SUMMARY

Updates on the capital program and its expenditures are brought to the Committee to keep members informed on Metro Vancouver's financial performance. This is the first report for the 2021 fiscal year and covers the first four months ending April 30, 2021. Attachment 1 provides a summary of the 2021 actual capital spending compared to the prorated Capital Cash Flow Budget. Attachment 4 provides additional information and narrative by department regarding the spending variances outlined in Attachment 1.

For the first four months of 2021, Metro Vancouver's Capital expenditures were underspent by approximately $361.5m of the prorated budget on a linear basis. Much of this variance represents a timing difference and is expected to catch up by year end. Any surplus resulting from capital program variance at the end of the year will be utilized as per the Board approved *Operating, Statutory and Discretionary Reserves Policy*.

PURPOSE

To present the Committee with the first report for 2021 on the financial performance of the capital program for the 4 months ending April 30, 2021.

BACKGROUND

Updates on the capital program and its expenditures are brought to the Committee to keep members informed on Metro Vancouver's financial performance to date. These updates include the actual financial progress of Metro Vancouver's capital expenditures compared to the approved spending limits.

Three updates are planned for the fiscal year 2021, which is consistent with the Performance and Audit Committee Terms of Reference. This is the first report for 2021.

Separate reports containing the same financial information are also presented to the Water, Liquid Waste and Zero-Waste Committees. For the 2021-year end, (reporting in April, 2022) such reports will also be presented to the Regional Parks and Housing Committees.

2021 CAPITAL EXPENDITURES

Capital Program Funding

The Metro Vancouver capital spending, for Liquid Waste, Solid Waste and Water are funded through the Operating Budget by a combination of contribution to capital (pay-as-you-go funding) and debt service costs (principal and interest payments) which is generated annually from the regional ratepayers. As a result, the annual impact on the ratepayers is significantly less than the level of budgeted capital expenditures. In 2021, the impact on the ratepayers for the Liquid Waste, Solid Waste and Water Capital Budgets of $1.46 billion is the capital funding of $367.5 million (contribution to capital and new debt service costs) included in the 2021 Operating Budget.

In the case of Regional Parks capital spending is funded from existing reserves. Contribution to these capital reserves is generated from the MVRD Tax Requisition.

For Housing Services, capital spending is funded through the Operating Budget from a combination of subsidies, grants, reserves, and debt service costs (principal and interest payments) which are primarily generated from housing rents.

2021 CAPITAL PROGRAM PROGRESS

The Metro Vancouver financial planning process included Board approval of both an annual Operating Budget (operations, contribution to capital and debt service) and an annual Capital Cash Flow Budget for the planned capital infrastructure projects. Projecting the spending on many capital projects represents somewhat of a timing exercise which is often subject to uncontrollable circumstances. Where a project is in the definition, pre-design or detailed design phases, it is more likely that a project may be subject to delays from necessary permitting, access, clarification of design details or procurement complexities which will result in a lag in spending. Conversely, when a project is within the construction phase where a contractor is in place and working effectively on site, actual spending tends to be close to budgeted expectations.

Attachment 1 provides a summary of the 2021 actual capital spending compared to the Board approved Capital Cash Flow Budget. Attachment 4 provides additional information and narrative by department regarding the spending variance outlined in Attachment 1.

Capital Cash Flow Budget variances below budget will often translate to lower than budgeted debt servicing costs in the operating budget as borrowing is lower than anticipated and deferred to future years. Those savings along with any other operating surpluses in any year, remain with the applicable function, and are applied the subsequent budget year impact as per the Board approved *Operating, Statutory and Discretionary Reserves Policy*.

For the four months ending April 30, 2021, Metro Vancouver's capital expenditures compared to the prorated Capital Cash Flow Budget was approximately $361.5m under spent.

Housing Services

Capital expenditures for Housing to the end of April was $2.4 million compared to a prorated Capital Cash Flow Budget of $16.4 million, with the majority of the expenditure being in housing re-development costs.

The total budgeted $49.1 million in capital expenditures for Housing in 2021 are to be funded through reserves, subsidies, grants and debt. Any amounts unspent from 2021 at the end of the year will remain in their respective reserves for future use.

Liquid Waste Services
Capital expenditures for Liquid Waste Services to the end of April were $73.0 million compared to a prorated Capital Cash Flow Budget of $311.5 million. The majority of the spending related to the North Shore Wastewater Treatment Plan project and Infrastructure Growth category projects underway.

The 2021 Operating Budget includes capital funding of $153.8 million. Year end capital variances from 2021 would result in a surplus within these amounts to be used in accordance with the *Operating, Statutory and Discretionary Reserves Policy*.

The "Status of Liquid Waste Services Capital Expenditures to April 30, 2021" included in Attachment 3 provides further information.

Regional Parks Services
Capital expenditures for Regional Parks to the end of April was $3.0 million compared to a prorated Capital Cash Flow Budget of $7.7 million, with the majority of the expenditure being in Parkland Acquisition.

The total budgeted $23.1 million in capital expenditures for Regional Parks in 2021 are to be funded through reserves. Any amounts unspent from 2021 at the end of the year will remain in their respective reserves for future use.

Solid Waste Services
Capital expenditures for Solid Waste Services to the end of April were $10.4 million compared to a prorated Capital Cash Flow Budget of $32.6 million. The majority of the spending related to Transfer Station System projects.

The 2021 Operating Budget included capital funding of $11.4 million. Year end capital variances below budget in 2021 would result in a surplus within these amounts to be used in accordance with the *Operating, Statutory and Discretionary Reserves Policy*.

The "Status of Solid Waste Services Capital Expenditures to April 30, 2021" included in Attachment 3 provides further information.

Water Services
Capital expenditures for Water Services to the end of April were $62.4 million compared to a prorated Capital Cash Flow Budget of $144.5 million. The majority of the spending is related to the Second Narrows Water Supply Tunnel project.

The 2021 Operating Budget included capital funding of $202.3 million. Year end capital variances below budget in 2021 would result in a surplus within these amounts to be used in accordance with the *Operating, Statutory and Discretionary Reserves Policy*.

The "Status of Water Services Capital Expenditures to April 30, 2021" included in Attachment 3 provides further information.

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

FINANCIAL IMPLICATIONS
For the four months ending April 30, 2021, Metro Vancouver's capital expenditures compared to the prorated Capital Cash Flow Budget was underspent by approximately $361.5m. Any surplus resulting from favorable capital program variance at the end of the year will be utilized in accordance with the Board approved *Operating, Statutory and Discretionary Reserves Policy*.

Regional Parks, whose capital expenditures are funded from reserves and for Housing whose capital expenditures are funded from reserves, subsidies, grants and debt, do not generate surplus from any Capital Cash Flow Budget variance as the monies will remain in the reserve. As these variances are generally due to timing, these funds are expected to be expended in future years.

SUMMARY / CONCLUSION
For the first four months of 2021, Metro Vancouver's Capital expenditures were underspent by approximately $361.5 million on a linear basis. The majority of the capital program relates to Liquid Waste, Solid Waste and Water. As this is the first report of the fiscal year, the spending is likely to catch up before the end of the year due to increased spending in summer months.

Attachments
1. 2021 Capital Spending Summary as at April 30, 2021
2. Capital Expenditure Summary as at April 30, 2021 - Liquid Waste, Solid Waste and Water
3. Detailed Capital Expenditure Summaries – Liquid Waste, Solid Waste and Water
4. Capital Project Status Information - Liquid Waste, Solid Waste and Water

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Metro Vancouver

2021 Capital Spending Summary
For the 4 months ending April 30, 2021

	2021 Budget to April 2021	Actual Expenditures	% of Prorated Budget	2021 Budget	Projected Total to Year End	% of Annual Budget
Housing Services						
Capital Replacement	3,163,000	1,716,032		9,488,074	9,488,074	
Development Capital	13,202,000	652,922		39,600,000	7,290,000	
	16,365,000	**2,368,954**	**14%**	**49,088,074**	**16,778,074**	**34%**
Liquid Waste Services						
Infrastructure Growth Capital	90,267,000	54,241,299		270,800,000	276,319,897	
Infrastructure Maintenance Capital	64,350,000	5,601,671		193,050,000	113,896,013	
Infrastructure Resilience Capital	7,167,000	2,238,415		21,500,000	9,507,613	
Infrastructure Upgrade - WasteTreatment Capital	142,093,000	7,024,985		426,278,000	428,556,384	
Infrastructure Upgrade Capital	5,650,000	3,198,870		16,950,000	34,610,612	
Opportunity Capital	1,983,000	740,323		5,950,000	5,996,339	
	311,510,000	**73,045,563**	**23%**	**934,528,000**	**868,886,858**	**93%**
Regional Parks						
Capital Development	2,346,000	269,385		7,040,000	7,040,000	
Capital Maintenance Projects	1,343,000	1,000,989		4,030,000	4,030,000	
Parkland Acquisition Fund Projects	4,000,000	1,707,349		12,000,000	12,000,000	
	7,689,000	**2,977,723**	**39%**	**23,070,000**	**23,070,000**	**100%**
Solid Waste Services						
Infrastructure Opportunity Program	683,000	81,743		2,050,000	1,157,071	
Landfills	2,466,000	635,884		7,400,000	4,775,140	
Transfer Station System	21,477,000	9,669,165		62,800,000	61,374,456	
Waste to Energy Facility	7,998,000	53,799		24,000,000	4,405,607	
	32,624,000	**10,440,592**	**32%**	**96,250,000**	**71,712,274**	**75%**
Water Services						
Infrastructure Growth Capital	55,850,000	11,385,877		167,550,000	90,783,946	
Infrastructure Maintenance Capital	30,400,000	18,935,944		91,200,000	71,156,778	
Infrastructure Resilience Capital	52,633,000	34,509,858		157,900,000	129,090,991	
Infrastructure Upgrade Capital	4,967,000	(2,473,735)		14,900,000	11,273,913	
Opportunity Capital	667,000	-		2,000,000	-	
	144,517,000	**62,357,944**	**43%**	**433,550,000**	**302,305,628**	**70%**
Total	**512,705,000**	**151,190,776**	**29%**	**1,536,486,074**	**1,282,752,834**	**83%**

ATTACHMENT 2

Metro Vancouver

Capital Expenditures Summary - by status
As at Apr 30, 2021

Liquid Waste Services	Total Budget	Total Projected Expenditures At Completion	Projected Remaining Budget
Ongoing	$ 6,313,437,000	$ 6,305,114,000	$ 8,323,000
Completed	1,800,000	1,380,000	420,000
Not Started	280,355,000	280,805,000	(450,000)
Cancelled	53,300,000	2,894,000	50,406,000
	$ 6,648,892,000	**$ 6,590,193,000**	**$ 58,699,000**

Solid Waste Services	Total Budget	Total Projected Expenditures At Completion	Projected Remaining Budget
Ongoing	$ 257,550,000	$ 257,304,710	$ 245,290
Completed	-	-	-
Not Started	257,850,000	257,850,000	-
Cancelled	-	-	-
	$ 515,400,000	**$ 515,154,710**	**$ 245,290**

Water Services	Total Budget	Total Projected Expenditures At Completion	Projected Remaining Budget
Ongoing	$ 7,386,971,000	$ 7,366,461,000	$ 20,510,000
Completed	8,850,000	8,050,000	800,000
Not Started	775,500,000	775,500,000	-
Cancelled	-	-	-
	$ 8,171,321,000	**$ 8,150,011,000**	**$ 21,310,000**

Total	**$ 15,335,613,000**	**$ 15,255,358,710**	**$ 80,254,290**

Metro Vancouver

ATTACHMENT 3 - LWS

Liquid Waste Services Capital Expenditures Summary
As of April 30, 2021

Project Name	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Projected Expenditures	Lifetime Projected Remaining Budget	Lifetime Percent Complete	Status	Project on Schedule?	Note	Comments
Infrastructure Growth Capital											
AIWWTP Site Construction Layout	Delta	1,500,000	282,543	1,217,457	450,000	1,050,000	37%	Ongoing	Y		
Albert Street Trunk Sewer	Port Moody	8,250,000	3,717,726	4,532,274	10,140,000	(1,890,000)	45%	Ongoing	Y		Higher costs are expected due to challenging ground conditions, a switch to tunnelling, and a longer length of sewer.
Annacis Outfall System	Delta	378,000,000	135,824,925	242,175,075	378,000,000	-	36%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 1 T1 & T2	Delta	243,500,000	235,898,670	7,601,330	243,500,000	-	100%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2	Delta	22,000,000	16,824,593	5,175,407	22,000,000	-	76%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2a	Delta	180,000,000	167,049,010	12,950,990	180,000,000	-	93%	Ongoing	Y		
Annacis Stage 5 Expansion Phase 2b	Delta	390,000,000	15,676,912	374,323,088	390,000,000	-	4%	Ongoing	Y		
Burnaby Lake North Interceptor Cariboo Section	Burnaby	41,000,000	-	41,000,000	41,000,000	-	0%	Not Started	N		Delayed to prioritize the Winston (upstream) section.
Burnaby Lake North Interceptor Winston Section	Burnaby	116,950,000	15,125,762	101,824,238	116,950,000	-	13%	Ongoing	Y		
Burnaby South Slope Interceptor West Branch Extension	Burnaby	13,200,000	-	13,200,000	13,200,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
Cloverdale Pump Station Capacity Upgrade	Surrey	36,400,000	291,074	36,108,926	36,400,000	-	1%	Ongoing	N		Slight delay to determine scope of upgrades
Cloverdale Trunk Sewer Capacity Upgrade	Surrey	29,000,000	-	29,000,000	29,000,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
Glenbrook Combined Trunk Kingsway Sanitary Section	Burnaby	7,200,000	295,541	6,904,459	7,200,000	-	4%	Ongoing	Y		
Hastings Sanitary Trunk Sewer No. 2	Burnaby	8,000,000	7,442,899	557,101	7,754,601	245,000	93%	Ongoing	Y	(1)(2)	Project in close out stages
Hastings-Cassiar Intake Connection	Vancouver	2,350,000	85,646	2,264,354	2,350,000	-	4%	Ongoing	N		Project delayed by one year to accommodate expanded scope (remotely operated gate) to improve functionality.
Lozells Sanitary Trunk Golf Course Section	Burnaby	27,650,000	-	27,650,000	27,650,000	-	0%	Not Started	Y		Future project scheduled to start in 2025
Lulu Island WWTP Digester No 3	Richmond	53,300,000	1,393,607	51,906,393	2,893,607	50,406,000	3%	Withdrawn	N		Project being withdrawn, some additional studies and analysis to improve system performance.
Marshend Pump Station Capacity Upgrade	Burnaby	13,775,000	553,832	13,221,168	13,775,000	-	4%	Ongoing	Y		
North Road Trunk Sewer	Coquitlam	11,675,000	6,635,795	5,039,205	11,675,000	-	57%	Ongoing	Y		
North Road Trunk Sewer Phase 2	Coquitlam	8,438,000	819,607	7,618,393	8,438,000	-	10%	Ongoing	Y		Project construction deferred until 2022-2023.
North Vancouver Interceptor - Lynn Branch Pre-build	Dist of North Van	3,950,000	3,212,264	737,736	3,950,000	-	81%	Ongoing	Y		Work is done, Waiting for Properties to negotiate an acceptable Highway Permit prior to paying MOTI
Northwest Langley Wastewater Treatment Projects	Langley Township	1,330,700,000	143,789,310	1,186,910,690	1,330,700,000	-	11%	Ongoing	Y	(5)	
NSI 104th Ave Extension	Surrey	12,950,000	4,938,694	8,011,306	12,950,000	-	38%	Ongoing	N		Project had been on hold for several years, and is being rescoped.
NSI Flow Management	Surrey	94,500,000	4,677,181	89,822,819	94,500,000	-	5%	Ongoing	N		Project delayed to improve scope definition and delivery method.
Port Moody Pump Station Capacity Upgrade	Port Moody	10,550,000	506,130	10,043,870	10,550,000	-	5%	Ongoing	N		Project on hold to allow proper scoping and budgetting.
Port Moody South Interceptor Capacity Upgrade	Port Moody	3,450,000	-	3,450,000	3,450,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
Rosemary Heights Pressure Sewer Capacity Upgrade	Surrey	10,750,000	-	10,750,000	10,750,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
Sapperton Pump Station	New Westminster	82,003,000	72,808,153	9,194,847	77,549,000	4,454,000	89%	Ongoing	N	(1)	Project nearing completion.
South Surrey Interceptor Johnston Section	Surrey	84,026,000	48,743,811	35,282,189	84,026,000	-	58%	Ongoing	N		Final section delayed due to protracted property and permitting issues.
SSI - King George Section - Odor Control Facility (OCF) and Grit Chamber	Surrey	19,500,000	16,081,216	3,418,784	18,500,000	1,000,000	82%	Ongoing	N		Project was delayed, but is now being commissioned.
		3,244,567,000	**902,674,901**	**2,341,892,099**	**3,189,301,208**	**55,266,000**					
Infrastructure Maintenance Capital											
AIWWTP Chemical Lab UPS System Replacement	Delta	600,000	-	600,000	600,000	-	0%	Not Started	Y		
AIWWTP Cogen Building Refurbishment	Delta	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	N	(4)	
AIWWTP Fibre Optic Infrastructure	Delta	1,500,000	1,286,060	213,940	1,400,000	100,000	86%	Ongoing	Y		
AIWWTP ICS Replacement Program	Delta	14,350,000	-	14,350,000	14,350,000	-	0%	Not Started	N		Late start to give way to Stage V Activities.
AIWWTP Influent System Remediation	Delta	82,500,000	366,822	82,133,178	82,500,000	-	1%	Ongoing	Y		
AIWWTP IPS Pump Building Roof Replacement Phase 2	Delta	830,000	-	830,000	830,000	-	0%	Not Started	N	(4)	Future project scheduled to start in 2024
AIWWTP Outfall Repair	Delta	1,800,000	-	1,800,000	1,800,000	-	0%	Not Started	N	(4)	Scope review underway to account for new inspection information.
AIWWTP Replacement of ICS Equipment in Galleries	Delta	2,895,000	1,819,933	1,075,067	2,895,000	-	63%	Ongoing	Y		
AIWWTP Scheduled 64kV Potential & Current Transformer Replacements	Delta	800,000	33,521	766,480	800,000	-	4%	Ongoing	N		
AIWWTP SCL Flow Balancing	Delta	2,450,000	913,895	1,536,105	2,450,000	-	37%	Ongoing	Y		
AIWWTP SCL Flow Control	Delta	31,500,000	15,367,147	16,132,853	31,500,000	-	49%	Ongoing	Y		
AIWWTP Scum Pump Replacement	Delta	1,350,000	-	1,350,000	1,350,000	-	0%	Not Started	N	(4)	Future project scheduled to start in 2024
AIWWTP Secondary Effluent Discharge Flowmeter Replacement	Delta	400,000	43,193	356,807	400,000	-	99%	Ongoing	Y	(2)	Project in final closeout phases, and will be completed significantly under budget by coordination with other works.
AIWWTP Spare Trickling Filter Pump & Motor Purchase	Delta	1,950,000	-	1,950,000	1,950,000	-	0%	Not Started	N	(4)	
AIWWTP Station Battery Replacement - PHASE 2	Delta	400,000	132,694	267,306	400,000	-	33%	Ongoing	Y	(2)	
AIWWTP Trickling Filter Media & Distributor Arms & Ducting Replacement	Delta	90,700,000	23,127,509	67,572,491	90,700,000	-	25%	Ongoing	Y		
Annacis Island WWTP - ICS Component Replacement and Upgrade Program	Delta	1,500,000	1,403,730	96,270	1,500,000	-	94%	Ongoing	Y		
Annacis MCC 80 051, 80 070, 80 071 Replacement	Delta	2,844,000	2,066,437	777,563	2,844,000	-	73%	Ongoing	Y		
Annacis Secondary Clarifier Corrosion Repair and Leveling Phase 2	Delta	22,000,000	8,589,445	13,410,555	22,000,000	-	39%	Ongoing	Y		
Big Bend Forcemain - Gate Replacement	Richmond	2,680,000	70,209	2,609,791	2,680,000	-	3%	Ongoing	N		Implementation Phase deferred to 2024
Cambie Trunk Sewer Relocation for Broadway Subway Project	Vancouver	4,500,000	1,925	4,498,075	4,500,000	-	1%	Ongoing	N		Project scope to be further defined after design/build team selected.
Combined Sewer Overflow Sampling Station Enhancements	Regional	1,900,000	284,286	1,615,714	1,900,000	-	15%	Ongoing	Y		

Metro Vancouver

Liquid Waste Services Capital Expenditures Summary
As of April 30, 2021

ATTACHMENT 3 - LWS

Project Name	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Projected Expenditures	Lifetime Projected Remaining Budget	Lifetime Percent Complete	Status	Project on Schedule?	Note	Comments
Crescent Beach FM - Replacement	Surrey	29,070,000	4,816,481	24,253,519	27,091,000	1,979,000	17%	Ongoing	Y		Phase 1 included design enhancements that allow Phase 2 to be deferred by several decades, resulting in a surplus.
English Bay/Balaclava Outfalls Improvement	Vancouver	900,000	-	900,000	900,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
FSA Flow Metering Program	Regional	3,500,000	1,514,786	1,985,214	3,500,000	-	43%	Ongoing	Y		
FSA Statutory Right of Way Acquisitions Phase 1	Delta/Port Moody	24,000,000	-	24,000,000	24,000,000	-	0%	Not Started	Y		
Gilbert/Brighouse Trunk Pressure Sewer Rehab Phase 5	Richmond	23,200,000	-	23,200,000	23,200,000	-	0%	Not Started	Y		Future project scheduled to start in 2023.
Gilbert/Brighouse Trunk Pressure Sewer Twinning Phase 3	Richmond	54,300,000	14,456,592	39,843,408	54,300,000	-	27%	Ongoing	N		Delays in Phase 4 and causing impacts to Phase 3
Gilbert/Brighouse Trunk Pressure Sewer Twinning Phase 4	Richmond	41,800,000	1,020,453	40,779,547	41,800,000	-	2%	Ongoing	N		Contractual issues resulted in needing to retender the work.
Glen Eagles Forcemains Replacement Phase 2	West Vancouver	7,750,000	586,987	7,163,013	8,200,000	(450,000)	8%	Ongoing	Y		
Glen Eagles Pump Stations Phase 1	West Vancouver	22,500,000	1,024,479	21,475,521	22,500,000	-	5%	Ongoing	Y		
Glen Eagles Pump Stations Phase 2	West Vancouver	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
Harbour Pump Station Discharge Header Repair and Valve Replacements	Vancouver	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	Y		
Harbour Pump Station Power Distribution Equipment Replacement	Vancouver	3,300,000	8,408	3,291,592	3,300,000	-	1%	Ongoing	Y		
Harbour West & East Interceptors Reloc & Protect	Vancouver	16,900,000	90,393	16,809,607	19,500,000	(2,600,000)	1%	Ongoing	Y		
Highbury Interceptor Diversion Junction Chamber Wall Rehabilitation	Vancouver	6,000,000	-	6,000,000	6,000,000	-	0%	Not Started	N		
IIWWTP Digester 4 Roof Replacement & Mixing Replacement	Richmond	24,800,000	17,469,398	7,330,602	19,307,842	5,492,000	90%	Ongoing	Y	(2)	
IIWWTP Grit System Refurbishment	Richmond	8,100,000	7,503,949	596,051	8,100,000	-	93%	Ongoing	Y		
IIWWTP ICS IPS Control Replacement	Richmond	1,750,000	385	1,749,615	1,750,000	-	1%	Ongoing	Y		
IIWWTP ICS Replacement Program	Richmond	750,000	-	750,000	750,000	-	0%	Not Started	Y		
IIWWTP Influent Gate Refurbishment	Richmond	1,350,000	428,876	921,124	1,110,641	239,000	32%	Ongoing	Y		
IIWWTP IPS Drive Remediation	Richmond	1,400,000	-	1,400,000	1,400,000	-	0%	Not Started	N	(4)	
IIWWTP MCC/Power Distribution Assess/Replace - Phase 2	Richmond	1,000,000	598,164	401,836	1,000,000	-	99%	Ongoing	Y	(2)	Project at close out stages and will see a surplus.
IIWWTP PA-Sed Tank & Gallery Wall Refurbishment	Richmond	925,000	-	925,000	1,375,000	(450,000)	0%	Not Started	N		Work delayed to confirm scope of repair.
IIWWTP Replacement of CoGen Control System	Richmond	2,470,000	1,088,501	1,381,499	2,470,000	-	44%	Ongoing	Y		
IIWWTP Siphon Chamber Refurbishment	Richmond	2,150,000	-	2,150,000	2,150,000	-	0%	Not Started	N		Project delayed to allow improved coordination of other related works and improve safe operating conditions for work site.
IIWWTP Solids Handling Refurbishment	Richmond	30,500,000	30,291,886	208,114	30,350,000	150,000	99%	Ongoing	Y	(2)	
Iona Island Control & Instrumentation Replacement 2011	Richmond	2,750,000	2,033,547	716,453	2,750,000	-	74%	Ongoing	Y		
Jervis Pump Station 25kV Voltage Conversion	Vancouver	1,300,000	3,358	1,296,642	1,300,000	-	1%	Ongoing	Y		
Kent Pump Station High Voltage Switchgear Replacement	Vancouver	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
LIWWTP CCT Isolation Gates	Richmond	2,050,000	530,958	1,519,042	2,050,000	-	26%	Ongoing	Y		
LIWWTP High Efficiency Boiler	Richmond	1,330,000	90,917	1,239,083	1,330,000	-	7%	Ongoing	N	(4)	Rescheduled to after Biogas Cleanup Project is completed and in operation.
LIWWTP ICS Component Replacement	Richmond	360,000	336,972	23,028	360,000	-	94%	Ongoing	Y		
LIWWTP ICS Replacement Program	Richmond	6,750,000	296,436	6,453,564	6,750,000	-	4%	Ongoing	Y		
LIWWTP PA-Sed Tank Refurbishment	Richmond	4,115,000	39,093	4,075,907	4,115,000	-	1%	Ongoing	Y		
LSA Flow Metering Program	Richmond	300,000	76,399	223,601	300,000	-	25%	Ongoing	Y		
Marshend PS Rehab	Burnaby	7,000,000	1,037,109	5,962,891	7,000,000	-	15%	Ongoing	N		Project delayed to confirm scope.
New West Interceptor Grit Chamber	New Westminster	9,050,000	220,696	8,829,304	9,050,000	-	2%	Ongoing	Y		
New Westminster Interceptor Repair Columbia St. Section	New Westminster	32,782,000	1,595,415	31,186,585	32,782,000	-	5%	Ongoing	Y		
NLWWTP Screw Pump Replacement	Langley City	1,550,000	739,352	810,648	1,550,000	-	48%	Ongoing	Y		
North Surrey Interceptor Annieville Channel Crossing Scour Protection	Regional	995,000	378,315	616,685	995,000	-	38%	Ongoing	Y		
NSA Flow Metering Program	West Vancouver	900,000	190,639	709,361	900,000	-	21%	Ongoing	Y		
NSA Scour Protection Upgrades	Regional	2,250,000	-	2,250,000	2,250,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
NSI Rehab or Replacement	Surrey	46,463,000	2,268,495	44,194,505	46,463,000	-	5%	Ongoing	N		Project delayed to improve scope definition, and coordination with other works.
NWI - Annacis Section 2 Improvement	Delta	45,000,000	858,213	44,141,787	45,000,000	-	2%	Ongoing	N		Project delayed to improve scope definition, and coordination with other works.
NWL WWTP 25 kV Substation Replacement	Langley Township	10,025,000	7,717,928	2,307,072	8,666,000	1,359,000	77%	Ongoing	Y	(1)	
Ocean Park Trunk Crescent Section (OPC) Pipe Rehabilitation/Replacement	Surrey	4,953,000	327,156	4,625,844	2,603,000	2,350,000	7%	Ongoing	N	(1)	Property acquisition delays.
Ocean Park Trunk Manholes Lining	Surrey	550,000	-	550,000	550,000	-	0%	Not Started	N		Future project scheduled to start in 2022
Port Coquitlam Pump Station Refurbishment	Port Coquitlam	9,250,000	5,779	9,244,221	9,250,000	-	1%	Ongoing	N		
Port Moody Storm Drain Rehabilitation	Port Moody	1,650,000	-	1,650,000	1,650,000	-	0%	Not Started	Y		Future project scheduled to start in 2022
Royal Ave PS Rehabilitation	New Westminster	7,238,000	1,133,236	6,104,764	8,169,988	(932,000)	16%	Ongoing	N		Scope to be reviewed pending final result of hydraulic study.
Sewer Relocations and Protections at Fraser Surrey Docks	Surrey	25,800,000	-	25,800,000	25,800,000	-	0%	Not Started	N		
Sewer Relocations and Protections for Pattullo Bridge Replacement Project	New Westminster	7,000,000	-	7,000,000	7,000,000	-	0%	Not Started	N		Project start based on 3rd party bridge contractor.
SSI Influent Control Chamber Repair and Replace Gates	Delta	1,305,000	13,554	1,291,446	1,305,000	-	1%	Ongoing	Y		
Surrey Corrosion Control Facility Replacement	Surrey	2,900,000	317,202	2,582,798	7,250,000	(4,350,000)	11%	Ongoing	N		Project delayed to resolve siting issues.
VSA Flow Metering Program	Regional	5,800,000	639,545	5,160,455	5,800,000	-	11%	Ongoing	Y		
Westridge FM Replacement	Burnaby	3,650,000	558,911	3,091,089	3,529,000	121,000	15%	Ongoing	Y	(3)	
Westridge Pump Stations 1 & 2 Refurbishment	Burnaby	16,250,000	576,505	15,673,495	16,250,000	-	4%	Ongoing	Y		
White Rock Forcemain Rehabilitation	White Rock/Surrey	8,700,000	-	8,700,000	8,700,000	-	0%	Not Started	Y		
Works Yard	Burnaby	32,000,000	26,550,793	5,449,207	32,000,000	-	83%	Ongoing	Y		
		889,880,000	**184,943,066**	**704,936,934**	**886,871,471**	**3,009,000**					
Infrastructure Resilience Capital											
AIWWTP 69 kV Substation Modifications	Delta	5,500,000	2,067,407	3,432,593	5,500,000	-	38%	Ongoing	Y		
AIWWTP Automation of Influent Gates	Delta	3,700,000	3,583,620	116,380	3,694,681	5,000	97%	Ongoing	Y		

Metro Vancouver

ATTACHMENT 3 - LWS

Liquid Waste Services Capital Expenditures Summary
As of April 30, 2021

Project Name	Project Location	Lifetime Total Project Budget	Lifetime Total Expenditures to Date	Lifetime Remaining Budget	Lifetime Projected Expenditures	Lifetime Projected Remaining Budget	Lifetime Percent Complete	Lifetime Status	Lifetime Project on Schedule?	Note	Comments
AIWWTP Cogeneration Backup Power	Delta	75,003,000	67,963,628	7,039,372	75,003,000	-	91%	Ongoing	Y		Project nearing completion and expected to come in under budget.
AIWWTP PST Area Walkway & Column Remediation	Delta	1,800,000	1,382,297	417,703	1,380,000	420,000	100%	Completed	Y	(1)(2)	Under budget due to efficient design, competitive market pricing and less tank defects than anticipated.
AIWWTP UPS Condition Monitoring System	Delta	550,000	-	550,000	550,000	-	0%	Not Started	N	(4)	Construction on hold until resolution of design issues.
Highbury Interceptor North Arm Crossing - Upgrade of Siphons	Vancouver	12,500,000	11,624,920	875,080	12,500,000	-	93%	Ongoing	Y		
IIWWTP - Biogas Lines Relocation	Richmond	5,780,000	3,759,968	2,020,032	5,780,000	-	75%	Ongoing	N		Delay caused by contractor's inability to secure approvals, materials, and resources in an efficient manner to meet stated schedule.
IIWWTP Standby Diesel Generators	Richmond	5,000,000	2,653	4,997,347	5,000,000	-	1%	Ongoing	Y		
LIWWTP Power Reliability	Richmond	8,202,000	1,282,540	6,919,460	8,202,000	-	16%	Ongoing	Y		
SSI Sulfide Odour and Corrosion Control	Delta	7,700,000	994,080	6,705,920	7,700,000	-	13%	Ongoing	N		Project delayed due to permitting challenges.
VSA Emergency Backup Power	Vancouver	24,310,000	11,644,994	12,665,006	24,310,000	-	48%	Ongoing	N		4 of 7 units are complete, 1 is nearing completion, and 2 (Jervis and Chilco PS), are delayed due to protracted property and permitting issues.
		150,045,000	**104,306,107**	**45,738,893**	**149,619,681**	**425,000**					
Infrastructure Upgrade - WasteTreatment Capital											
Iona Secondary Treatment Upgrade	Richmond	750,000,000	17,063,367	732,936,633	750,000,000	-	2%	Ongoing	Y	(5)(6)	
North Shore WWTP Secondary Upgrade and Conveyance	Dist of North Van	1,057,867,000	370,135,998	687,731,002	1,057,867,000	-	35%	Ongoing	Y	(5)	
		1,807,867,000	**387,199,365**	**1,420,667,635**	**1,807,867,000**	**-**					
Infrastructure Upgrade Capital											
AIWWTP Ammonia Removal – Sidestream	Delta	125,900,000	733,551	125,166,449	125,900,000	-	1%	Ongoing	Y	(4)	Continuing with data collection with more analyses in 2022 to confirm study results.
AIWWTP Electrical Distribution System Protection Control and Monitoring	Delta	2,650,000	76,077	2,573,923	2,650,000	-	3%	Ongoing	Y		
AIWWTP Replacement of Protective Relays	Delta	3,258,000	2,156,041	1,101,959	3,258,000	-	66%	Ongoing	Y		
All WWTPs Power Quality Monitoring & Outage Alarming Network	Regional	2,870,000	2,118,632	751,368	2,870,000	-	74%	Ongoing	Y		
Biosolids Dryer	Langley City	211,700,000	74,112	211,625,888	211,700,000	-	0%	Ongoing	N		Property purchase delayed.
Ferguson Road Paving Refurbishment	Richmond	850,000	-	850,000	850,000	-	0%	Not Started	Y		
Glenbrook Combined Trunk Sewer Separation	New Westminster	73,450,000	199,359	73,250,641	73,450,000	-	1%	Ongoing	Y		
IIWWTP Biosolids Dewatering Facility	Richmond	61,300,000	46,363,116	14,936,884	61,300,000	-	76%	Ongoing	Y		
IIWWTP Sludge Lagoons Dewatering Facility	Richmond	4,000,000	112,876	3,887,124	4,000,000	-	3%	Ongoing	Y		
LIWWTP Effluent Heat Recovery Project	Richmond	10,000,000	-	10,000,000	10,000,000	-	0%	Not Started	Y		
New CSO Management Gates for New Westminster Interceptor	New Westminster	5,925,000	204,463	5,720,537	5,925,000	-	3%	Ongoing	Y		
Ocean Park Trunk Sewer - Air Management Facility	Surrey	7,750,000	-	7,750,000	7,750,000	-	0%	Not Started	Y		
WWTPs Electrical System Studies & Upgrades	Regional	1,900,000	2,303	1,897,697	1,900,000	-	1%	Ongoing	N	(4)	Awaiting completion of AI Stage 5 Ph1 and AI Cogen projects studies.
		511,553,000	**52,040,531**	**459,512,469**	**511,553,000**	**-**					
Opportunity Capital											
AIWWTP Hydrothermal Processing Pilot	Delta	19,380,000	875,304	18,504,696	19,380,000	-	10%	Ongoing	Y		
Fraser Sewerage Area Integrated Resource Recovery (IRR) Study	Regional	1,200,000	36,637	1,163,363	1,200,000	-	3%	Ongoing	N		
LIWWTP Biogas Clean-up Project	Richmond	13,800,000	11,066,370	2,733,630	13,800,000	-	80%	Ongoing	Y		
LIWWTP Pilot Digestion Optimization Facility	Richmond	3,100,000	973,113	2,126,887	3,100,000	-	31%	Ongoing	Y		
North Surrey Interceptor - Port Mann Section - Odour Control	Surrey	7,500,000	98,647	7,401,353	7,500,000	-	1%	Ongoing	Y		
		44,980,000	**13,050,070**	**31,929,930**	**44,980,000**	**-**					
Grand Total Liquid Waste Services		**6,648,892,000**	**1,644,214,041**	**5,004,677,959**	**6,590,192,000**	**58,700,000**					

Notes:

(1) Project will be completed under budget - savings due to competitive pricing.
(2) Full contingency not required.
(3) Design work done in house resulting in lower cost.
(4) Project on hold.
(5) Separate status reports are being provided to the Finance and Intergovernment committee, Liquid Waste Committee and Board.
(6) Project budget is for up to 2025 only.

Metro Vancouver

ATTACHMENT 3 - SWS

Solid Waste Services Capital Expenditures Summary

As of April 30, 2021

		Lifetime									
Project Name	**Project Location**	**Total Project Budget**	**Total Expenditures to Date**	**Remaining Budget**	**Projected Expenditures**	**Projected Remaining Budget**	**Percent Complete**	**Status**	**Project on Schedule?**	**Note**	**Comments**
Infrastructure Opportunity Program											
WTE Facility District Heating Opportunities	Burnaby	2,300,000	224,672	2,075,328	2,300,000	-	10%	Ongoing	Y		
		2,300,000	**224,672**	**2,075,328**	**2,300,000**	**-**					
Landfills											
Alternative Fuel and Recyclables Recovery Centre	Coquitlam	60,000,000	-	60,000,000	60,000,000	-	0%	Not Started	Y		
Coquitlam Landfill Closure*	Coquitlam	5,000,000	4,605,720	394,280	5,000,000	-	92%	Ongoing	Y		
Coquitlam Landfill East Closure	Coquitlam	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	Y		Dependent on area development
Coquitlam Landfill Fly Ash Cell 2 Closure Final Cover*	Coquitlam	3,200,000	2,942,982	257,018	3,200,000	-	92%	Ongoing	Y		
Coquitlam Landfill Gas Collection Upgrades*	Coquitlam	3,100,000	2,613,635	486,365	3,100,000	-	84%	Ongoing	Y		
Coquitlam Landfill Gas Collection Upgrades Phase II*	Coquitlam	3,600,000	2,851,247	748,753	3,600,000	-	79%	Ongoing	Y		
Coquitlam Landfill Lot 3 Development*	Coquitlam	5,000,000	-	5,000,000	5,000,000	-	0%	Ongoing	Y		
Coquitlam Landfill Pump Station Upgrade*	Coquitlam	800,000	97,158	702,842	800,000	-	12%	Ongoing	Y		
Coquitlam Landfill: Leachate Collection System Grade Realignment	Coquitlam	1,000,000	-	1,000,000	1,000,000	-	0%	Not Started	Y		
		86,700,000	**13,110,743**	**73,589,257**	**86,700,000**	**-**					
Recycling and Waste Centre System											
United Boulevard Recycling and Waste Centre Compactor	Coquitlam	2,500,000	1,919,492	580,508	2,400,000	100,000	77%	Ongoing	Y		
United Boulevard Recycling and Waste Centre	Coquitlam	77,600,000	58,919,893	18,680,107	77,600,000	-	76%	Ongoing	Y		Facility expected to open in summer 2021
Langley Recycling and Waste Centre Recycling Depot Expansion	Langley Township	5,500,000	-	5,500,000	5,500,000	-	0%	Not Started	Y		
Maple Ridge Recycling and Waste Centre Upgrades	Maple Ridge	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
North Shore Recycling and Waste Centre Compactor Replacement	North Vancouver	2,500,000	-	2,500,000	2,500,000	-	0%	Not Started	Y		
Central Surrey Recycling and Waste Centre	Surrey	62,300,000	24,042,470	38,257,530	62,300,000	-	39%	Ongoing	Y		Facility expected to open in spring 2022
North Surrey Recycling and Waste Centre Compactor Replacement	Surrey	2,500,000	-	2,500,000	2,500,000	-	0%	Not Started	Y		
North Surrey Recycling and Waste Centre Recycling Depot Expansion	Surrey	25,500,000	-	25,500,000	25,500,000	-	0%	Not Started	Y		
Western Region Recycling and Waste Centre Replacement	Regional	75,000,000	-	75,000,000	75,000,000	-	0%	Not Started	Y		
		255,400,000	**84,881,855**	**170,518,145**	**255,300,000**	**100,000**					
Waste to Energy Facility											
Acid Gas Reduction	Burnaby	41,000,000	450,000	40,550,000	41,000,000	-	1%	Ongoing	Y		Operational Certificate amendment pending
Biosolids Processing	Burnaby	20,500,000	330,202	20,169,798	20,367,710	132,000	2%	Ongoing	Y		
Bottom Ash Crane Replacement	Burnaby	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	Y		
Bottom Ash Processing	Burnaby	6,800,000	6,068,930	731,070	6,800,000	-	89%	Ongoing	Y		
Carbon Silo Replacement	Burnaby	2,400,000	-	2,400,000	2,400,000	-	0%	Not Started	Y		
Compressed Air System Replacement	Burnaby	3,000,000	-	3,000,000	3,000,000	-	0%	Not Started	Y		
District Energy	Burnaby	40,000,000	-	40,000,000	40,000,000	-	0%	Not Started	Y		
Electrical Transformers Replacement	Burnaby	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	Y		
Fabric Filter Hopper and Pulse Header Refurbishment	Burnaby	2,250,000	-	2,250,000	2,250,000	-	0%	Ongoing	Y		
Feed Hopper/Chute	Burnaby	2,600,000	1,121,722	1,478,278	2,587,000	13,000	43%	Ongoing	Y		
Fly Ash Silo Refurbishment	Burnaby	1,000,000	-	1,000,000	1,000,000	-	0%	Not Started	Y		
Generation Bank Replacement	Burnaby	9,000,000	-	9,000,000	9,000,000	-	0%	Not Started	Y		
Lime Silo Replacement	Burnaby	3,600,000	-	3,600,000	3,600,000	-	0%	Not Started	Y		
Primary Economizer Replacement	Burnaby	5,000,000	53,799	4,946,201	5,000,000	-	1%	Ongoing	Y		
Primary Superheaters Replacement	Burnaby	4,000,000	-	4,000,000	4,000,000	-	0%	Not Started	Y		
Programmable Logic Controllers Replacement	Burnaby	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
Pug Mill Enclosure Ventilation System Replacement	Burnaby	1,000,000	-	1,000,000	1,000,000	-	0%	Not Started	Y		
Refuse Crane	Burnaby	14,000,000	73,539	13,926,461	14,000,000	-	1%	Ongoing	Y		
Secondary Economizers Replacement	Burnaby	6,000,000	-	6,000,000	6,000,000	-	0%	Not Started	Y		
Stack Refurbishment	Burnaby	350,000	-	350,000	350,000	-	0%	Not Started	Y		
		171,000,000	**8,098,192**	**162,901,808**	**170,854,710**	**145,000**					
Grand Total Solid Waste Services		**515,400,000**	**106,315,462**	**409,084,538**	**515,154,710**	**245,000**					

NOTE:

* Coquitlam Landfill projects being completed as a part of the United Boulevard Recycling and Waste Centre construction project

Metro Vancouver
Water Services Capital Expenditures Summary
As of April 30, 2021

		Lifetime									
Project Name	**Project Location**	**Total Project Budget**	**Total Expenditures to Date**	**Remaining Budget**	**Total Projected Expenditures**	**Projected Remaining Budget**	**Percent Complete**	**Status**	**Project on Schedule?**	**Note**	**Comments**
Infrastructure Growth Capital											
Annacis Main No. 5 (Marine Crossing)	New West/Surrey	488,000,000	32,777,640	455,222,360	485,000,000	3,000,000	7%	Ongoing	N		Design took longer than aniticipated.
Annacis Main No. 5 (North)	New Westminster	51,500,000	585,370	50,914,630	51,500,000	-	1%	Ongoing	Y		
Annacis Main No. 5 (South)	Surrey	56,900,000	2,281,268	54,618,732	56,900,000	-	5%	Ongoing	Y		
Cape Horn Pump Station No. 3	Coquitlam	171,550,000	874,664	170,675,336	171,550,000	-	1%	Ongoing	Y		
Coquitlam Intake No. 2 & Tunnel	Coquitlam	1,181,230,000	7,798,481	1,173,431,519	1,181,230,000	-	1%	Ongoing	Y		
Coquitlam Intake No. 2 (Water Treatment)	Coquitlam	1,486,000,000	582,968	1,485,417,032	1,486,000,000	-	1%	Ongoing	Y		
Coquitlam Main No. 4 (Cape Horn)	Coquitlam	152,600,000	1,252,838	151,347,162	152,600,000	-	1%	Ongoing	Y		
Coquitlam Main No. 4 (Central Section)	Coquitlam	204,470,000	3,796,183	200,673,817	204,470,000	-	2%	Ongoing	Y		
Coquitlam Main No. 4 (South Section)	Coquitlam	408,250,000	3,955,214	404,294,786	408,250,000	-	2%	Ongoing	Y		
Fleetwood Reservoir	Surrey	43,367,000	4,030,104	39,336,896	43,367,000	-	9%	Ongoing	N		Project delayed due to property approval.
Grandview Reservoir Unit No. 2	Surrey	26,000,000	-	26,000,000	26,000,000	-	0%	Not Started	Y		
Haney Main No. 4 (West Section)	Port Coquitlam	74,050,000	361,054	73,688,946	74,050,000	-	1%	Ongoing	Y		
Hellings Tank No. 2	Delta	29,411,000	5,267,075	24,143,925	29,411,000	-	18%	Ongoing	Y		
Jericho Reservoir No. 1	Langley Township	38,065,000	37,576,592	488,408	40,265,000	(2,200,000)	99%	Ongoing	Y	(c) (i)	
Kennedy Newton Main	Surrey	132,550,000	41,830,754	90,719,246	116,710,000	15,840,000	32%	Ongoing	N	(b)	Route selection delays.
Newton Pump Station No. 2	Surrey	50,800,000	4,508,167	46,291,833	50,800,000	-	9%	Ongoing	N		Property acquisition delays.
Newton Reservoir Connection	Surrey	27,050,000	-	27,050,000	27,050,000	-	0%	Not Started	Y		
Port Mann Main No. 2 (South)	Surrey	36,800,000	29,640,877	7,159,123	36,800,000	-	95%	Ongoing	Y		
South Surrey Main No. 2	Surrey	143,700,000	86,012	143,613,988	143,700,000	-	1%	Ongoing	Y		
South Surrey Main No. 2 Nickomekl Dam Prebuild	Surrey	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
Whalley Kennedy Main No. 2	Surrey	96,000,000	-	96,000,000	96,000,000	-	0%	Not Started	Y		
Whalley Main	Surrey	31,800,000	26,274,736	5,525,264	31,800,000	-	90%	Ongoing	Y		
		4,932,093,000	**203,479,997**	**4,728,613,003**	**4,915,453,000**	**16,640,000**					
Infrastructure Maintenance Capital											
Annacis Main No. 2 - Queensborough Crossover Improvement	New Westminster	1,200,000	-	1,200,000	1,200,000	-	0%	Not Started	Y	(f)	Likely not required. MOTI not planning on relocating Queensborough Main.
Annacis Main No. 3 BHP Potash Facility Pipe Protection	Surrey	600,000	-	600,000	600,000	-	0%	Not Started	Y	(f)	
Beach Yard Facility - Site Redevelopment	Dist of North Van	45,500,000	-	45,500,000	45,500,000	-	0%	Not Started	Y		
Boundary Road Main No. 2 & No. 3 Decommissioning	Burnaby	1,500,000	36,335	1,463,665	1,500,000	-	2%	Ongoing	Y		
Burnaby Mountain Main No. 2	Burnaby	10,200,000	-	10,200,000	10,200,000	-	0%	Not Started	Y		
Burnaby Mountain Pump Station No. 2	Burnaby	21,000,000	242,082	20,757,918	21,000,000	-	1%	Ongoing	N		Scope of work under review
Cape Horn Reservoir Condition Assessment and Structural Repair	Coquitlam	1,550,000	-	1,550,000	1,550,000	-	0%	Not Started	Y		
Capilano Main No. 5 (South Shaft to Lost Lagoon)	Vancouver	260,000,000	10,513,534	249,486,466	260,000,000	-	5%	Ongoing	N		Delayed due to project approval timelines.
Capilano Main No. 7 Line Valve & Swing Connection	Dist of North Van	2,100,000	1,938,963	161,037	2,100,000	-	92%	Ongoing	Y		
Capilano Raw Water Pump Station Bypass PRV Upgrades	Dist of North Van	1,500,000	54,129	1,445,871	1,500,000	-	4%	Ongoing	Y		
Capilano Watershed Security Gatehouse	Dist of North Van	2,300,000	516,396	1,783,604	2,175,000	125,000	22%	Ongoing	Y		
Central Park Main No. 2 (10th Ave to Westburnco)	Burnaby	28,350,000	-	28,350,000	28,350,000	-	0%	Not Started	N		Delayed due to project scope review.
Central Park Main No. 2 (Patterson to 10th Ave)	Burnaby	91,900,000	20,974,142	70,925,858	91,900,000	-	23%	Ongoing	Y		
Central Park Reservoir Structural Improvements	Burnaby	1,900,000	-	1,900,000	1,900,000	-	0%	Not Started	Y		
Central Park WPS Starters Replacement	Burnaby	8,000,000	991,729	7,008,271	8,000,000	-	12%	Ongoing	Y		
CLD & SFD Fasteners Replacement & Coating Repairs	Dist of North Van	2,100,000	776,260	1,323,740	2,100,000	-	75%	Ongoing	Y		
Cleveland Dam - Lower Outlet HBV Rehabilitation	Dist of North Van	4,900,000	1,194,370	3,705,630	4,900,000	-	24%	Ongoing	Y		
Cleveland Dam Drumgate Seal Replacement	Dist of North Van	1,250,000	269,208	980,792	1,250,000	-	22%	Ongoing	Y		
Coquitlam Pipeline Road Remediation	Coquitlam	2,000,000	799,496	1,200,504	2,000,000	-	40%	Ongoing	Y	(g)	
CWTP Ozone Sidestream Pipe Heat Trace and Insulation	Coquitlam	900,000	-	900,000	900,000	-	0%	Not Started	Y		
CWTP Ozone Sidestream Pump VFD Replacement	Coquitlam	1,400,000	19,916	1,380,084	1,400,000	-	1%	Ongoing	Y		
CWTP pH, Alkalinity Upgrades	Coquitlam	1,700,000	1,666,015	33,985	1,700,000	-	98%	Ongoing	Y		
Dechlorination for Reservoir Overflow and Underdrain Discharges	Burnaby	2,700,000	-	2,700,000	2,700,000	-	0%	Not Started	Y		
Douglas Road Main No. 2 - Kincaid Section	Burnaby	12,300,000	9,705,838	2,594,162	12,300,000	-	79%	Ongoing	N		Alignment changes.
Douglas Road Main No. 2 (Vancouver Heights Section)	Burnaby	21,486,000	19,747,748	1,738,252	21,486,000	-	92%	Ongoing	N	(b)	Procurement delays.
Douglas Road Main No. 2 Still Creek	Burnaby	63,100,000	4,752,738	58,347,262	63,100,000	-	8%	Ongoing	N		Alignment changes.
Douglas Road Main Protection	Burnaby	1,500,000	-	1,500,000	1,500,000	-	0%	Ongoing	Y	(f)	
E2 Shaft Phase 3	Dist of North Van	16,500,000	15,467,236	1,032,764	16,500,000	-	94%	Ongoing	Y		
First Narrows Tunnel Isolation Chamber Improvements	Dist of North Van	7,000,000	3,313,448	3,686,552	5,000,000	2,000,000	47%	Ongoing	Y	(a)(b)	
Improvements to Capilano Mains No. 4 and 5	Dist of North Van	1,700,000	107,495	1,592,505	1,700,000	-	6%	Ongoing	Y		
Kersland Reservoir No. 1 Structural Improvements	Vancouver	6,250,000	394,426	5,855,574	6,250,000	-	6%	Ongoing	Y		
Little Mountain Reservoir Roof Upgrades	Vancouver	3,450,000	181,141	3,268,859	3,450,000	-	7%	Ongoing	Y		
Lulu Island - Delta Main - Scour Protection Phase 2	Richmond	3,550,000	-	3,550,000	3,550,000	-	0%	Not Started	Y	(f)	
Lulu Island - Delta Main No. 2 (Marine Crossing)	Richmond	370,000,000	-	370,000,000	370,000,000	-	0%	Not Started	Y		

Metro Vancouver
Water Services Capital Expenditures Summary
As of April 30, 2021

		Lifetime									
Project Name	**Project Location**	**Total Project Budget**	**Total Expenditures to Date**	**Remaining Budget**	**Total Projected Expenditures**	**Projected Remaining Budget**	**Percent Complete**	**Status**	**Project on Schedule?**	**Note**	**Comments**
Maple Ridge Main West Lining Repairs	Maple Ridge	3,500,000	190,470	3,309,530	3,500,000	-	7%	Ongoing	Y		Additional scope of work identified.
Newton Rechlorination Station No. 2	Surrey	5,000,000	-	5,000,000	5,000,000	-	0%	Not Started	N		Project delayed to coordinate with Newton Pump Station Project.
Port Mann Main No. 1 (Fraser River Crossing Removal)	Coq/Surrey	18,500,000	255,000	18,245,000	18,500,000	-	2%	Ongoing	Y		
Port Moody Main No. 1 Christmas Way Relocation	Coquitlam	2,350,000	-	2,350,000	2,350,000	-	0%	Not Started	Y	(f)	
Port Moody Main No. 3 Dewdney Trunk Rd Relocation	Coquitlam	2,700,000	(162)	2,700,162	2,700,000	-	1%	Ongoing	Y	(f)	
Port Moody Main No. 3 Scott Creek Section	Coquitlam	12,000,000	212,097	11,787,903	12,000,000	-	4%	Ongoing	Y		
Queensborough Main Royal Avenue Relocation	New Westminster	7,500,000	6,158	7,493,842	7,500,000	-	1%	Ongoing	Y		
Rechlorination Station SHS Storage Tank Replacement	Regional	1,200,000	129,530	1,070,470	1,200,000	-	11%	Ongoing	Y		
Rechlorination Station Upgrades	Regional	15,000,000	378,372	14,621,628	15,000,000	-	3%	Ongoing	Y		
Rehabilitation of AN2 on Queensborough Bridge	New West/Delta	2,500,000	11,361	2,488,639	2,500,000	-	1%	Ongoing	Y		
Relocation and Protection for MOTI Expansion Project Broadway	Vancouver	8,900,000	49,432	8,850,568	8,900,000	-	1%	Ongoing	Y	(f)	
Relocation and Protection for MOTI George Massey Crossing Replacement	Delta / Richmond	2,450,000	-	2,450,000	2,450,000	-	0%	Not Started	Y	(f)	
Relocation and Protection for Translink Expansion Project Surrey Langley SkyTrai	Surrey	6,600,000	-	6,600,000	6,600,000	-	0%	Not Started	Y	(f)	
Sapperton Main No. 2 North Road Relocation and Protection	Coquitlam	6,500,000	-	6,500,000	6,500,000	-	0%	Not Started	Y		
SCFP Centralized Compressed Air System	Dist of North Van	900,000	665	899,335	900,000	-	1%	Ongoing	Y		
SCFP Clearwell Membrane Replacement	Dist of North Van	17,400,000	-	17,400,000	17,400,000	-	0%	Not Started	Y		
SCFP Concrete Coatings	Dist of North Van	2,500,000	2,317,864	182,136	2,755,398	(255,000)	93%	Ongoing	Y	(j)	
SCFP OMC Building Expansion	Dist of North Van	2,650,000	9,274	2,640,726	2,650,000	-	1%	Ongoing	Y		
SCFP Polymer System Upgrade	Dist of North Van	3,450,000	448,726	3,001,274	3,450,000	-	14%	Ongoing	Y		
SCFP SCADA/ICS Controller Replacement	Dist of North Van	1,400,000	-	1,400,000	1,400,000	-	0%	Not Started	Y		
South Delta Main No. 1 - Ferry Road Check Valve Replacement	Delta	600,000	68,286	531,714	600,000	-	11%	Ongoing	Y		
South Surrey Main No. 1 Nickomekl Dam Relocation	Surrey	7,100,000	-	7,100,000	7,100,000	-	0%	Not Started	N	(f)	Project delayed (City of Surrey)
South Surrey Supply Main (Serpentine River) Bridge Support Modification	Surrey	400,000	79,469	320,531	400,000	-	20%	Ongoing	Y		
Sunnyside Reservoir Unit 1 Upgrades	Surrey	8,850,000	7,778,887	1,071,113	8,050,000	800,000	100%	Completed	Y	(b)	
Tilbury Main North Fraser Way Valve Addition	Burnaby	3,100,000	265,723	2,834,277	3,100,000	-	9%	Ongoing	Y		
Water Chamber Improvements and Repairs	Burnaby	2,000,000	-	2,000,000	2,000,000	-	0%	Not Started	Y		
Westburnco Pump Station No. 2 VFD Replacements	New Westminster	2,550,000	101,548	2,448,452	2,550,000	-	4%	Ongoing	Y		
		1,148,986,000	**105,965,346**	**1,043,020,654**	**1,146,316,398**	**2,670,000**					
Infrastructure Resilience Capital											
Barnston/Maple Ridge Pump Station - Back-up Power	Pitt Meadows	9,000,000	240,156	8,759,844	9,000,000	-	3%	Ongoing	Y		
Burnaby Mountain Tank No. 2	Burnaby	21,650,000	45,415	21,604,585	21,650,000	-	1%	Ongoing	Y		
Burnaby Mountain Tank No. 3	Burnaby	21,400,000	-	21,400,000	21,400,000	-	0%	Not Started	Y		
Cambie Richmond Main No. 3 (Marine Crossing)	Richmond/Van	490,250,000	1,340,153	488,909,847	490,250,000	-	1%	Ongoing	Y		
Cape Horn Pump Station 2 - Back-Up Power	Coquitlam	8,000,000	88,069	7,911,931	8,000,000	-	1%	Ongoing	Y		
Capilano Mid-Lake Debris Boom	Dist of North Van	750,000	-	750,000	750,000	-	1%	Ongoing	Y		Tender has been awarded
Capilano Raw Water Pump Station - Back-up Power	Dist of North Van	33,000,000	6,407,247	26,592,753	33,000,000	-	19%	Ongoing	N		Site selection delays.
Capilano Reservoir Boat Wharf	Dist of North Van	850,000	-	850,000	850,000	-	8%	Ongoing	Y		Tender document completeion in progress
Clayton Langley Main No. 2	Surrey	16,900,000	-	16,900,000	16,900,000	-	0%	Not Started	Y		
Cleveland Dam Power Resiliency Improvements	Dist of North Van	1,700,000	25,177	1,674,823	1,700,000	-	1%	Ongoing	Y		
Cleveland Dam Seismic Stability Evaluation	Dist of North Van	800,000	-	800,000	800,000	-	0%	Not Started	Y		
Coquitlam Intake Tower Seismic Upgrade	Coquitlam	26,000,000	1,100,993	24,899,007	26,000,000	-	4%	Ongoing	Y		
Critical Control Sites - Back-Up Power	Regional	1,800,000	-	1,800,000	1,800,000	-	0%	Not Started	Y		
CWTP Ozone Back-up Power	Coquitlam	7,450,000	-	7,450,000	7,450,000	-	0%	Not Started	Y		
Emergency Power Strategy for Regional Water Facilities	Regional	400,000	-	400,000	400,000	-	0%	Ongoing	Y		Project terms of reference under development. Expected completion Q4 of 2021
Grandview Pump Station Improvements	Surrey	2,600,000	199,901	2,400,099	2,600,000	-	8%	Ongoing	Y		
Haney Main No. 4 (Marine Crossing)	P.Coq/P.Meadows	390,250,000	235,112	390,014,888	390,250,000	-	1%	Ongoing	Y		
Mackay Creek Debris Flow Mitigation	Dist of North Van	9,700,000	9,023,693	676,307	9,700,000	-	93%	Ongoing	N		Delays due to challenging ground conditions.
Pebble Hill Pump Station Seismic Upgrade	Delta	1,800,000	-	1,800,000	1,800,000	-	0%	Not Started	N	(e)	Coordinating with City of Delta.
Pebble Hill Reservoir No. 3 Seismic Upgrade	Delta	9,500,000	356,321	9,143,679	9,500,000	-	4%	Ongoing	Y		
Pebble Hill Reservoir Seismic Upgrade	Delta	14,800,000	422,949	14,377,051	12,800,000	2,000,000	3%	Ongoing	N	(b)	Design delays due to geotechnical conditions.
Reservoir Isolation Valve Automation	Regional	6,450,000	1,149,196	5,300,804	6,450,000	-	18%	Ongoing	Y		Delayed due to scope refinement.
Scour Protection Assessments and Construction General	Regional	4,000,000	-	4,000,000	4,000,000	-	0%	Not Started	Y		
Second Narrows Crossing (Tunnel)	Burnaby/DNV	468,550,000	231,707,255	236,842,745	468,550,000	-	49%	Ongoing	N		Construction taking longer than anticipated
Seymour Falls Boat Wharf	Dist of North Van	800,000	-	800,000	800,000	-	11%	Ongoing	Y		Tender document completeion in progress
Seymour Lake Debris Boom	Dist of North Van	800,000	-	800,000	800,000	-	36%	Ongoing	Y		Tender document completeion in progress
Seymour Main No. 2 Joint Improvements	Dist of North Van	5,252,000	488,220	4,763,780	5,252,000	-	16%	Ongoing	N		Work delayed to coordinate with Second Narrows Crossing
Seymour Main No. 5 III (North)	Dist of North Van	236,900,000	4,244,835	232,655,165	236,900,000	-	2%	Ongoing	Y		

Metro Vancouver **ATTACHMENT 3 - WS**
Water Services Capital Expenditures Summary
As of April 30, 2021

		Lifetime								
Project Name	**Project Location**	**Total Project Budget**	**Total Expenditures to Date**	**Remaining Budget**	**Total Projected Expenditures**	**Projected Remaining Budget**	**Percent Complete**	**Status**	**Project on Schedule?**	**Note**	**Comments**
Seymour Reservoir Mid-Lake Debris Boom	Dist of North Van	2,300,000	161,961	2,138,039	2,300,000	-	8%	Ongoing	Y		
Sunnyside Reservoir	Surrey	19,300,000	7,472,318	11,827,682	19,300,000	-	42%	Ongoing	Y		
Vancouver Heights System Resiliency Improvements	Burnaby	1,500,000	-	1,500,000	1,500,000	-	0%	Not Started	Y		
Westburnco Pump Station - Back-up Power	New Westminster	23,500,000	977,932	22,522,068	23,500,000	-	4%	Ongoing	N		Design delay, scope modification.
		1,837,952,000	**265,686,900**	**1,572,265,100**	**1,835,952,000**	**2,000,000**					
Infrastructure Upgrade Capital											
CWTP Ozone Generation Upgrades for Units 2 & 3	Coquitlam	7,000,000	2,791,708	4,208,292	7,000,000	-	40%	Ongoing	N		Delay due to operational requirements.
Lower Seymour Conservation Reserve Learning Lodge Replacement	Dist of North Van	5,000,000	597,764	4,402,236	5,000,000	-	12%	Ongoing	Y		
Online Chlorine Monitoring Stations	Regional	4,150,000	-	4,150,000	4,150,000	-	0%	Not Started	Y		
Sapperton Main No. 1 New Line Valve and Chamber	New Westminster	3,800,000	868,373	2,931,627	3,800,000	-	23%	Ongoing	N		Tie-ins delayed
South Delta Main No. 1 - 28 Ave to 34B Ave	Delta	22,650,000	18,464,225	4,185,775	22,650,000	-	97%	Ongoing	N		Construction delays due to unforeseen environmental and geotechnical conditions.
South Delta Mains - 28 Ave Crossover	Delta	10,500,000	10,213,321	286,680	10,500,000	-	97%	Ongoing	N		Utility conflicts and additional scope of work.
Tilbury Junction Chamber Valves Replacement with Actuators	Richmond	5,600,000	4,374,234	1,225,766	5,600,000	-	78%	Ongoing	Y		
Water Meter Upgrades	Regional	22,400,000	3,706,632	18,693,368	22,400,000	-	17%	Ongoing	N		Procurement delays.
Water Optimization - Flow Meters (Non-billing) Phase 1	Regional	16,500,000	-	16,500,000	16,500,000	-	0%	Not Started	Y		
Water Optimization - Flow Meters (Non-billing) Phase 2	Regional	19,500,000	-	19,500,000	19,500,000	-	0%	Not Started	Y		
Water Optimization - Instrumentation	Regional	11,400,000	-	11,400,000	11,400,000	-	0%	Not Started	Y		
Water Optimization Automation & Instrumentation	Regional	9,540,000	7,536,816	2,003,184	9,540,000	-	79%	Ongoing	N		Procurement delays.
		138,040,000	**48,553,073**	**89,486,927**	**138,040,000**	**-**					
Opportunity Capital											
Capilano Hydropower	Dist of North Van	114,250,000	218,368	114,031,632	114,250,000	-	1%	Ongoing	N		Project currently on hold
		114,250,000	**218,368**	**114,031,632**	**114,250,000**	**-**					
Grand Total Water Services		**8,171,321,000**	**623,903,684**	**7,547,417,316**	**8,150,011,000**	**21,310,000**					

Notes:

(a) Contingency not required.
(b) Construction costs lower than estimated.
(c) City of Surrey share - 33.72%, Township of Langley share - 66.28%.
(d) Project cancelled.
(e) Cost sharing proposal with City of Delta
(f) Project start is dependent on a 3rd party. External agency yet to begin work.
(g) GVWD Cost Share City of Coquitlam, Fortis and BC Hydro
(h) Extent of construction scope less than originally anticipated.
(i) Design change/consutant
(j) Extent of construction scope increased

ATTACHMENT 4

Capital Project Status Information
April 30, 2021

GREATER VANCOUVER SEWERAGE & DRAINAGE DISTRICT (Liquid Waste Services)

Major GVS&DD liquid waste capital projects are generally proceeding on schedule and within budget. The following capital program items and exceptions are highlighted:

Infrastructure Growth Program

- **FSA – Albert Street Trunk Sewer** – The Albert St. Trunk Sewer is a sanitary sewer located in the City of Port Moody that was constructed in the 1960's and is in need of a capacity upgrade. Phase 1 construction was completed in 2019. Phase 2 of the project includes the upgrade of a section that is approx. 200 m long and crosses Barnet Hwy just north of St. John St. The sewer surcharges in a residential area under heavy rain. Microtunneling was selected as the preferred method of construction. The tender was awarded in April 2021. Phase 2 Construction is expected to be complete by the end of 2021.

- **FSA – Burnaby Lake North Interceptor (also known as the Winston Street Sewer)** – Phase 1 of the sewer twinning along Lougheed Highway west of Sperling Street is complete. Phase 2 and 3, with diameters of 1050 mm to 1800 mm, involves 1.2 km of open cut and 2 km of tunneled sewer respectively, and will be located along Winston Street from Sperling to east of Piper Street on the north side of Burnaby Lake. The open cut portion of the work was awarded to JJM Construction Ltd. in February 2020 and the construction is now underway. The tunneling portion of the work is aimed to be tendered in Q3 of 2021. Construction is scheduled to be complete in 2023. Phase 4, which continues to Cariboo Street, will be completed at a later date. The project is expecting a surplus on the open cut section, and will report out on the overall surplus after the tunneled section is tendered.

- **FSA – South Surrey Interceptor – King George Section Odour Control Facility (OCF) and Grit Chamber**. This project involves three separate installations: two odour control facilities (at King George Boulevard near 56 Ave in Surrey and at Highway 10 and Highway 91 in Delta) and a grit chamber at the King George location. The grit chamber portion of this project is complete and in service. Tritech Group Ltd., the contractor for the odour control facilities, has completed the facility at Highway 91 and is still working on the King George facility. It is scheduled to be commissioned later in the summer of 2021. The project is projecting a surplus at the end of construction.

- **FSA – Sapperton Pump Station** – The construction contract was awarded to NAC Constructors in September 2016 and was substantially completed in 2020. The pump station is in service with some minor work being finished. The old pump station decommissioning has been postponed due to some operational constraints until 2022 or 2023. The project as a whole is projecting a surplus. A planned upgrade of the existing Sapperton PS generator is on hold due to some newly discovered issues in our system which are being addressed elsewhere.

- **FSA – Annacis Island WWTP Stage 5 Expansion Phase 1** – This work involves expansion of treatment process units including primary sedimentation tanks, secondary clarifiers, solid contact tanks, and odour control facilities. This construction contract was awarded to Graham and AECON Joint Venture in April 2017. The contract value is $266 million and the construction is nearing completion. Corporation Commissioning of the primary sedimentation tanks and the secondary clarifiers both began in April 2021 and is still ongoing. Corporation Commissioning of primary odour control facilities began in May 2021 and is still ongoing. The solid contact tanks are expected to start Corporation Commissioning in June 2021. Substantial completion of the overall project was also achieved in May 2021. Handover to the plant is expected to be completed by August 2021.

- **FSA – Annacis Island WWTP Outfall –** This project involves the construction of a new outfall with increased capacity to support population growth. The 4.2 m diameter outfall will be tunneled at a depth of approximately 40 m, and convey treated effluent approximately 1 km from the Plant to the Fraser River where it will discharge from a 2.5 m diameter, 250 m long diffuser manifold buried in the river bed. The construction contract was awarded in May 2019 to Pomerleau-Bessac General Partnership. The contractor has completed the excavation of the two vertical shafts. In-river construction started in June 2020. The installation of the temporary cofferdam (which facilitates installation of the River Riser) and the foundation piles for the River Riser are complete. Mining of the first tunnel started in February. Construction is scheduled to be complete by Spring 2024. In-river works are progressing slower than planned, and the launch of the Tunnel Boring Machine took longer than expected. With recovery plans in place, the completion dates are expected to be met. The project is projecting a surplus, and will report out on that as tunneling and other higher risk elements are completed.

- **FSA- Annacis Island WWTP Outfall – Surge Control** - This project involves the replacement of four hydraulic gates in the Influent Control Chamber and ancillary equipment to mitigate the risk of transient surges to upstream infrastructure. The construction contract was awarded to Maple Reinders Construction Limited in March 2021. The contractor is currently preparing submittals for long lead items such as hydraulic gates. Construction is approximately 5% complete. The project is tracking on schedule with the project scheduled for completion in Spring 2024.

<u>Infrastructure Maintenance Program</u>

- **LSA – Gilbert Trunk Sewer Twinning** - Construction of the 3.5 km long Phase 1 is complete. The remaining 3 Phases have a total length of 6.5 km consisting of 1.5 m and 1.8 m diameter sewers. Phase 2 construction from Blundell to north of Westminster Highway is 98% complete, with completion projected for Q2 of 2021. Phase 4, from Steveston Highway to the Lulu Island WWTP, was tendered in July of 2020 and has not yet been awarded due to contractual issues. Phase 3, which extends from Blundell Road south to the Steveston Highway will be completed last, with construction scheduled to start in 2022.

- **FSA - North Surrey Interceptor Rehab or Replacement -** This project involves rehabilitating approximately 220m of the existing NSI-156th Street section between creek structure and junction chamber. It also involves relocation and upgrading of City of Surrey connection to the NSI. Work is currently underway and is expected to completed before the end of 2021.
  The other part of this project is rehabilitation or replacement of approximately 760m of the existing NSI-Manson Road section. The project is currently in early conceptual design stage. Newly received input from the City of Surrey is being considered and may move focus from rehabilitation to replacement and upsizing. Construction is expected to commence in late 2023.

- **FSA - Crescent Beach FM – Replacement –** This project involves the design and construction of approximately 2 km of sanitary force main to replace the existing 500 mm diameter FRP (fibre reinforce plastic) pipe which is aging and in poor condition. The design is complete and the work has been tendered. This work is being is being executed in two parts. Part 1, Small Works, involves construction by MV Forces covering smaller works and tie-ins, and was completed in the fall of 2020. Part 2, Main Works, involves construction by an external contractor covering large main line replacement, trenchless crossings, and flow meter chamber has been tendered, and is anticipated to be completed between summer 2021 and spring 2022. During execution of the Part 1 construction work, archaeological artefacts were identified, resulting in extensive archeological and additional costs.

- **FSA - New Westminster Interceptor Repair – Columbia Street Section** – This project involves the rehabilitation of 1,600 m of the 1.5 m diameter New Westminster Interceptor from Front St. to McBride Blvd. The construction is planned to commence in Q3 of 2021. There is a potential to defer some work to a later due to operational restraints and Pattullo Bridge construction.

- **FSA - Ocean Park Trunk Crescent Section (OPC) Pipe Rehabilitation/Replacement** - This project involves the design and construction of a 420m long sewer between 24 Avenue & Bayview Street, in Surrey. The design has been completed, the construction tender awarded to a contractor and construction is set to commence in July of 2021. It is anticipated that the construction should be completed by the end of 2021. This work was to have been completed in 2020, but was delayed due to Covid-19 and property issues.

- **VSA – Iona Island WWTP Solids Handling Upgrade and Iona Digester 4 Roof Replacement** – These projects involve upgrades to the existing grit removal and sludge screening systems, increasing sludge thickening capacity, and improving the digester sludge mixing systems. Construction to refurbish the existing sludge thickener was completed in April 2016 and is back in full operation. The construction of the new screening, degritting and thickening facility was completed and in operation since August 2017. The Digester Mixing Upgrade contract started in November 2015 and, of the four digesters, Digesters No. 2, No. 3 and No. 4 upgrades are complete and back in service. Work on the last digester, Digester No. 1, started in July 2019 and substantial completion was achieved at the end of January 2021. The overall program is projected to have a surplus.

- **FSA – Annacis Island WWTP Secondary Clarifier Corrosion Repair** – This project involves replacing 12 secondary clarifier mechanisms that have been damaged by corrosion and are at the end of their service life. This project is combined with the Secondary Clarifier Flow Control project, which involves the addition of 12 new influent flow balancing gates and the replacement of 12 effluent launders and weirs. The current construction contract, awarded to NAC Constructors Ltd. in March 2019 for the amount of $17.8M, consists of the replacement of the 5 remaining mechanism units, the addition of 9 flow balancing gates and the replacement of the 12 existing effluent launders and weirs. Construction started in May 2020 and is scheduled to be complete by end of 2022. To date 9 mechanisms, 2 launders and weirs have been replaced, and 7 flow balancing gates have been installed.

- **FSA – Annacis Island WWTP Trickling Filter Media, Distributor and FOA Duct Replacement** – This project replaces the rotary distributors, plastic media and foul air ducting for the four Trickling Filters at the AIWWTP. These components have been in service for over 20 years and are reaching the end of their service life. The distributors and ducting have experienced significant corrosion, resulting in recent equipment failures requiring emergency maintenance in the past few years. The construction will be completed in two contracts, with the first contract for two TFs and the second contract for the remaining two TFs. This work is to be done over four years, one TF per year during

the low flow season. The first contract was awarded at $32.8M. The refurbishment for the first TF (TF 1) started in April 2020 and was successfully completed in September 2020 before the start of the wet weather season. Refurbishment of the second TF (TF 3) is started in mid-April 2021. The second contract for the refurbishment of the remaining two TFs (TF 2 and TF 4) is currently in procurement. All four TF are anticipated to be refurbished by the end of 2023.

- **FSA – Northwest Langley WWTP 25 kV Substation Replacement -** This project involves the design and construction of a new 25kV substation to replace the existing outdoor substation which transforms and distributes power to areas in the plant. Due to its age and poor condition of the switchgear enclosures, the existing substation has been assessed as unreliable for maintenance and operations. Construction commenced in Q1 2019. The new substation installation is complete and is ready for the new BC Hydro 25kV service connection and cutover to existing plant loads. The construction is anticipated to be completed by Q3 2021.

Infrastructure Resilience Program

- **FSA – Annacis Island WWTP Cogeneration System** – This $75 million resiliency project involves the installation of four new larger capacity cogeneration engines (2000 kW each) complemented by two new emergency stand-by diesel generators (3000 kW each) in order to: 1) provide rapid response emergency back-up power in case of BC Hydro utility outages, 2) optimize the use of digester gas produced at the plant, 3) increase the cogeneration capacity, 4) minimize the amount and cost of electricity imported from BC Hydro costs, and 5) minimize digester gas flaring.

  Construction started in October 2017 and was substantially completed as of September 2019. The new cogeneration engines and diesel generators have been functionally tested, commissioned and put into partial service as of March 2020 in order to offset BC Hydro costs. The final phase of commissioning began in November 2020. Some latent weaknesses in the plant's legacy electrical systems became evident during the November 2020 testing under certain operating scenarios of the new cogeneration system; these weaknesses have since been mostly rectified. There are some minor remaining deficiencies to address, an optimization project in the Summer of 2021 to upgrade the biogas fuel supply system, and two minor remaining operational tests in November 2021 (outside of disinfection season) to prove out additional ICS programming refinements. As a result, the project is considered 99% completed and is expected to post a surplus.

- **VSA – Emergency Backup Power -** This project involves design, supply and installation of standby emergency backup generators at the Chilco, Columbia, Harbour, Hudson, Jervis, Kent and Willingdon pump stations to allow the stations to remain operational during power failure events and reduce the risk of a spill. Three separate tenders for the Columbia, Harbour, Hudson, Kent and Willingdon upgrades were issued in Q4 2019. The construction at Harbour, Hudson, Kent and Willingdon pump stations was complete in 2020 and generators were commissioned. Columbia PS genset is scheduled to be commissioned in Q2 of 2021. The Vancouver Parks Board approved the Jervis Genset concept in the fall of 2019, and the design and permitting of the Jervis facility is advancing. Construction has been delayed due to unresolved property issues. The Chilco facility concept is currently being reviewed with the Vancouver Parks Board, prior to starting the detailed design. To prevent future spills during power outages, MV is actively working on design and installation of temporary gensets at both Chilco and Jervis PS later in 2021 or early 2022.

Infrastructure Upgrade Program

- **VSA – Iona Island WWTP Biosolids Dewatering Facility** – This project involves the construction of a mechanical dewatering facility to dewater on-going plant production of biosolids so that they can be transported for beneficial reuse or disposal. This facility will permit the decommissioning of the four existing digested sludge lagoons and the sludge drying area to make space for the construction of the new treatment plant. The $55 million design-build contract was awarded to NAC Constructors in April 2019. The design phase is 99% completed, and the construction phase is about 75% complete. Ground improvement and civil works underground piping, foundations and concrete works are complete. The two Digested Sludge Storage Tanks, Dewatering Building, Truck Load-out Building, Mechanical/Electrical/Control Rooms have been erected and enclosed – they are currently undergoing finishing. Almost all mechanical process equipment such as the centrifuges, hoppers, pumps, and screw conveyors have been delivered and installed since April 2021. The project has now entered the electrical installation phase – i.e. cable pulls, transformer installation, switchgear, motor control centres, and the wiring of field devices and instrumentation. The dewatering facility is targeted for acceptance by MV in Q4 2021 with Owner Commissioning beginning in Q1 2022.

Opportunity Program

- **FSA – Annacis Island WWTP Hydrothermal Liquefaction –** This work involves design and construction of a demonstration scale plant to convert wastewater biomass to biocrude as a low carbon fuel. The objective of the demonstration scale is to assess the technology performance and feasibility for full-scale implementation at an existing or future WWTP. Six separate contracts are anticipated as part of this project. Procurement of a progressive design build contractor for the HTL system is underway. Design of the supporting ancillary systems outside of the HTL system is currently underway. The entire HTL demonstration plant is scheduled to be completed in 2023 and put in operation from 2023 to 2024.

- **LSA - Lulu Island WWTP Biogas Cleanup Project** - This project involves the design and construction of a new digester gas clean-up facility at LIWWTP for producing pipeline quality RNG (a.k.a. bio-methane) for sale to Fortis Energy Inc. This project supports Metro Vancouver's commitment to protect public health and the environment. This innovative treatment system will result in a decrease in the flaring of digester gas, a reduction in regional greenhouse gas emissions, and the reuse of a sustainable resource. The system will produce enough renewable natural gas to heat 400 homes and gas production will increase as our local population grows. The project is 90%completed and is presently undergoing functional and operational testing of its sub-systems by the equipment suppliers and contractors. The overall system is expected to be accepted by MV to begin Owner Commissioning in June 2021.

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Capital Project Status Information – Solid Waste Services

April 30, 2021

Major GVS&DD solid waste capital projects are proceeding on schedule and within budget. Project details are highlighted below:

Recycling and Waste Centre Program

- The United Boulevard Recycling and Waste Centre construction started in May 2018 with site grading works. The full construction contract was awarded in December 2018. Construction is currently near completion with anticipated opening of the new facility in the summer 2021.
- The Central Surrey Recycling and Waste Centre project received rezoning and a development permit in late 2018. The construction contract was awarded in the summer of 2020. Construction was initiated in July of 2020. Construction is underway and expected to be completed by the end of 2021 or potentially early 2022, and operating in early 2022.

Landfills Program

- Construction of Phase 2 landfill gas collection system upgrades is being completed as a part of the construction of the United Boulevard Recycling and Waste Centre. The system has been designed as a combination of an active system at buildings and a passive system over the remainder of the recycling and waste centre site. Installation of the active gas wells was completed in 2019. Installation of the passive system along with laterals and header pipes for the active system was completed in late 2020. The new landfill gas infrastructure will be commissioned prior to United Boulevard Recycling and Waste Centre opening. A new control room and compressor at the blower flare station are required and procurement for this work is expected to start in 2021.

Waste-to-Energy Program

- The refuse crane replacement project commenced with preliminary engineering on February 14, 2019. The preliminary engineering report identified a funding gap which was addressed through the 2021 budget cycle. Covanta has submitted a detailed budget estimate which has been reviewed by a third party engineering firm. Covanta is now preparing procurement documents to for the next phase of the project which will include detailed design and the refuse crane purchase.
- The second pass superheater replacement project started on April 11, 2019. The replacement tubing has been received and installed on all three boilers. This project is now essentially complete pending final billing from Covanta.
- The feedwater pump replacement project commenced on May 3, 2019. The pump was installed in November 2019 and commissioned in January 2020. Covanta has worked with the pump manufacturer and the pump is now operating at full specifications. Final commissioning work was completed during the July 2020 outage. Covanta is now preparing a funding request to

replace the back-up feedwater pumps as they have reached the end of their useful life and require replacing.

- The feed hopper / chute replacement project started on October 28, 2019. Two feed chutes were installed in the fall 2020 shutdowns and one unit was installed in the spring 2021 shutdown. Two feed chute inlet hoppers will be replaced in 2021 and one in 2022 as they could not be completed during the same shutdowns as the feed chutes.
- The biosolids processing preliminary design project started on October 28, 2019. The preliminary design report is under review.
- The primary economizer project commenced with engineering and procurement services on November 6, 2020. The RFP is currently posted on BC Bid, closing on June 22.
- Compressed Air System Replacement Project: Covanta has shortlisted a proponent and issued a funding request for an engineering study to replace the compressors.
- Fabric filter hopper and pulse header refurbishment: Covanta is preparing procurement documents and will initiate an RFQ shortly.

ATTACHMENT 4

Capital Project Status Information
April 30, 2021

GREATER VANCOUVER WATER DISTRICT (Water Services)

Major GVWD capital projects are generally proceeding on schedule and within budget. The following capital program items and exceptions are highlighted:

Infrastructure Growth Program

- **Annacis Main No. 5 (Marine Crossing)** – A 2.3 km long, 4.5 m diameter water supply tunnel is required under the Fraser River to meet growing water demand south of the Fraser and to provide increased system resiliency. Detailed design, which was awarded to Hatch Corporation, is now complete. Property acquisition along the tunnel alignment is nearing completion, and construction management services have been awarded. The RFP for construction was issued in April 2020 and will close in late June. Construction is anticipated to commence in early 2022.

- **Annacis Main No. 5 (South)** – This project comprises approximately 3.0 km of 1.8 m diameter steel pipe connecting the south shaft of the Annacis Water Supply Tunnel to the Kennedy Reservoir in the City of Surrey. Preliminary design has been completed and detailed design is in progress and expected to be complete in February 2022.

- **Cape Horn Pump Station No. 3** – Cape Horn Pump Station No. 3 with a back-up power system, will supplement the existing pump station to deliver Coquitlam source water to meet growing demand in the municipalities south of the Fraser River. Preliminary design of the new station started Q1 2020 and is expected to be complete Q3 2021.

- **Coquitlam Intake No. 2** – A new intake, tunnel and treatment plant are proposed at the Coquitlam Reservoir to increase the regional supply from this source and meet growing future demand. The Draft Project Definition Report was received in December 2019. A Value Engineering workshop was held in May 2020 to review options to reduce risks, confirm costs and improve the schedule. The Final Project Definition Report, which will incorporate suitable options identified in the Value Engineering, is expected to be completed in July 2021.

- **Coquitlam Main No. 4** – This 12 km long steel water main, consisting of the Central, South and Cape Horn Sections, will increase the transmission capacity from the Coquitlam source to the Cape Horn Pump Station and Reservoir in the City of Coquitlam. This project is required to address capacity constraints in the existing Coquitlam transmission system and also provide additional transmission capacity for the Coquitlam Intake No. 2. Detailed design of the Central and South Sections continues. A Request for Proposal for the 2.3 km tunnel portion of the South Section will be issued in June 2021. Detailed design of the Cape Horn section is now underway.

- **Fleetwood Reservoir** – Phase 1 of the Fleetwood Reservoir project includes a 13.6 ML reservoir, valve chamber, piping, access building and associated work located at Meagan Ann MacDougall Park in the City of Surrey. Detailed design is complete. The City of Surrey is finalizing the Property

Lease Agreement and a Coordinated Works Agreement to include a portion of the City water main in the tender package. Construction is expected to commence in Q3 2021.

- **Jericho Reservoir** – Phase 1 of the Jericho Reservoir project includes a 20.6 ML reservoir, chambers, piping and associated work located at 20400 73A Avenue in the Township of Langley. Construction is approximately 95% complete. Tie-ins and commissioning of the valve chamber are complete. The reservoir is scheduled to enter service in July 2021.

- **Kennedy Newton Main** – This project comprises approximately 9.0 km of 1.8 m diameter steel water main between the Kennedy Reservoir and the Newton Reservoir in the City of Surrey and is divided into 3 phases. Construction of Phase 1, between 72nd Avenue and 84th Avenue, is complete. Construction of Phase 2, between 72nd Avenue and Newton Reservoir commenced in September 2020. Design of the remaining Phase 3, from 84th Avenue to Kennedy Reservoir, is in progress and expected to be completed in November 2021.

- **Newton Pump Station No. 2** – This project, located at 6287 128th Street in the City of Surrey, consists of replacing the existing Newton Pump Station and includes full back-up power redundancy, connections to existing and future infrastructure, and installation of new outlets to the existing Newton Reservoir. The preliminary design phase was completed in December 2019 and detailed design is in progress with completion expected in October 2021. Construction is anticipated to start in Summer 2022.

- **Port Mann Main No. 2 (South)** – This 2.8 km long, 1.5 m diameter steel water main will twin the existing Port Mann Main No. 1 between the south shaft of the Port Mann Water Supply Tunnel and the Whalley Main in the City of Surrey. The project is required to meet growing water demand south of the Fraser River. The main installation construction contract was completed in July 2020 with final tie-ins and commissioning planned for summer/fall 2021.

- **Whalley Main** – This 2.0 km long, 1.5 m diameter steel main will twin the existing Whalley Clayton Main between the Whalley Reservoir and the Whalley Kennedy Link Main in the City of Surrey. The main installation construction contract commenced in June 2019 and Substantial Completion was achieved on March 2021. Tie-ins and commissioning are planned to commence in fall 2021.

<u>Infrastructure Maintenance Program</u>

- **Douglas Road Main No. 2 – Still Creek Section** - This project comprises approximately 2.5 km of 1.5 m diameter steel pipe with trenchless crossings of Highway 1, Still Creek and the BNSF rail line. The water main alignment has been finalized in consultation with the City of Burnaby. The detailed design phase is in progress and the required rights of ways are in the process of being finalized. The Project is planned to be constructed in three phases, with the North Open Cut Section commencing in June 2021. Design of the Trenchless Crossing Section is complete with construction planned to start in fall 2021. Design of the South Open Cut Section is underway.

  Douglas Road Main No. 2 – Vancouver Heights Section - This project comprises approximately 2.0 km of 1.5 m diameter steel pipe connecting the Vancouver Heights Reservoir to the Douglas Road Main No. 2 at Beta Avenue and Albert Street in the City of Burnaby. The installation construction contract is complete. Final tie-ins and commissioning are planned for fall 2021.

- **Central Park Main No. 2 – Patterson to 10th Ave** - This project comprises approximately 7.0 km of 1.2 m diameter steel pipe connecting the Central Park Pump Station in Burnaby to the existing Central Park Main in New Westminster at 10th Avenue. The water main is divided into three phases with the 500 m long Maywood Pre-build completed in December 2020. Construction of Phase 1 of the project commenced in October 2020 with completion anticipated in mid-2021. Design of Phase 2 is underway and is expected to be complete in fall 2021.

- **E2 Shaft Replacement** – The E2 Shaft, which has controlled ground water in the East Abutment of Cleveland Dam since the 1950's is nearing the end of its service life and needs to be replaced by a system of horizontal drains. A total of 6 horizontal drains have been completed, and continue to be monitored. The project consultants and Technical Review Board have analyzed the information. No additional drains are required at this time. The project is now complete.

- **Capilano Main No. 5 (Stanley Park Section)** – This 1.4 km long steel water main, in a tunnel, will replace the aged existing Capilano Main No. 4 through Stanley Park to meet growing water demand and provide increased system resiliency. Detailed design is nearing completion. The procurement phase for construction will commence in late 2021, with construction anticipated to start in late 2022.

Infrastructure Resilience Program

- **Mackay Creek Debris Flow Mitigation** – Detailed design and construction engineering services for this project were awarded to BGC Engineering Inc. The construction contract was awarded to BEL Contracting. Construction commenced in spring 2019 and was completed in March 2020. Site replanting began in Fall 2020 and is expected to be completed in late 2021.

- **Second Narrows Water Supply Tunnel** – This project comprises a 1.1 km long, 6.5 m diameter water supply tunnel under Burrard Inlet, between North Vancouver and Burnaby, to increase the reliability of supply in the event of a major seismic event and provide additional long term supply capacity. The contract for construction was awarded to the Traylor-Aecon General Partnership in October 2018. Construction of the north shaft is complete and construction of the south shaft is substantially complete. The Tunnel Boring Machine began tunnel excavation in the Fall of 2020 and the tunnel is now approximately 40% complete.

- **Capilano Raw Water Pump Station – Back-up Power** – This project consists of installing diesel generators to provide 8 MW of back-up power to the pump station. Shop drawing submittals for the pre-purchased electrical equipment are ongoing, with a portion of the equipment already delivered. Construction is anticipated to start early 2022 with overall project completion in 2024.

- **Coquitlam Intake Tower Seismic Upgrade** – The Coquitlam Intake Tower is located in the southeast corner of the Coquitlam Reservoir. Constructed in 1913, the tower provides the GVWD its primary intake of water from Coquitlam Reservoir. The Tower is a 27 m high and 5.5 m diameter unreinforced concrete structure, founded on bedrock. Detailed design of the seismic upgrade is 60% complete. Completion of detailed design is expected at the end of 2021. Due to coordination with BC Hydro work and water supply operations, construction will be completed over two winter periods 2024 to 2026.

- **Pebble Hill Reservoir No. 1, 2 and 3 Seismic Upgrade** – Pebble Hill Reservoir in south Delta is comprised of three units. Detailed design for the seismic upgrade is complete. Construction is scheduled to be completed in stages, taking only one unit out of service at any time. Construction of Units 1 and 2 has been awarded and will commence in fall of 2021

- **Westburnco Pump Station – Back-up Power** – This project consists of installing diesel generators to provide 5 MW's of back-up power to the pump station. Preliminary design was completed in 2019 and detailed design continues in 2021 and 2022.

Infrastructure Upgrade Program

- **Coquitlam Ozone Upgrade** – This project consists of upgrades to the ozone generators at the Coquitlam Water Treatment Plant. The generators for units 1 and 2 have been replaced and are in service. Unit 3 will be upgraded in Q3 2021

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To: Performance and Audit Committee

From: Joe Sass, Director Financial Planning and Operations/Deputy CFO

Date: June 17, 2021 Meeting Date: July 7, 2021

Subject: **Interim Financial Performance Report – April 2021**

RECOMMENDATION

That the Performance and Audit Committee receive for information the report dated June 17, 2021 titled "Interim Financial Performance Report – April 2021".

EXECUTIVE SUMMARY

The projected overall operational results for 2021 for Metro Vancouver's functions is close to $21.6 million on an approved budget of $943.8 million (or slightly less than 2.3% of the approved budget.) Historically, Metro Vancouver has observed an operating surplus in the range of 3%-5% per annum.

As we move from the recent COVID-19 pandemic events of the 2020 year into the current 2021 year, and alongside the ratepayers and the residents and businesses of the Region, Metro Vancouver is continuing to face some extraordinary circumstances and financial pressures as a result of the COVID-19 pandemic event. As the year progresses and financial impacts to Metro Vancouver are monitored, work plans will be adjusted as may be required to adapt to the changing circumstances along with any substantial financial pressures that might arise to minimize financial impacts to the final results while also examining all opportunities for mitigation while maintaining service levels.

PURPOSE

To present the Committee with an update on financial performance with projections through to the end of the fiscal year.

BACKGROUND

The Performance and Audit Committee Terms of Reference requires that the Committee be provided, three times per year, an update on the financial performance of the Metro Vancouver Districts and Metro Vancouver Housing Corporation with the report on the year-end results also sent to the Board.

This is the first report for 2021 and is based on operating experience through the end of April 2021.

HIGHLIGHTS

Operating Results

Financial Services staff work with departments to review and understand their financial operating results through to the end of the reporting period to establish revenue and expenditure trends and identify issues to be considered in projecting results from operations through to the end of the year. This information forms the basis for the explanations and trend analysis of key financial indicators as provided in Attachment 1.

Staff make best efforts to accurately predict year end results, however with the challenge of predicting the continued impacts from COVID- 19 and as this is the first financial performance report

for the year, the limited information and operating experience to-date makes it challenging to confidently project expenditures and revenues through to the end of the fiscal year.

All of Metro Vancouver's Districts and functions are projected to be in a surplus position for the 2021 fiscal year. An overview of the projected 2021 financial performance, by District is provided below. Details, explanations and a trend analysis of some key financial indicators are provided in the attachment.

$ Millions

	Revenues	Operating Expenditures	Debt Service Costs	Total Projected Surplus
Water District	($ 1.1)	$ 2.1	($ 0.1)	$ 0.9
Sewerage & Drainage:				
Liquid Waste Services	(5.3)	13.0	(0.3)	7.4
Solid Waste Services	1.5	5.4	0.1	7.0
MV Housing Corporation	(0.1)	2.8	-	2.7
Regional District	0.1	3.5	-	3.6
Surplus (Deficit)	**($ 4.9)**	**$ 26.8**	**($ 0.3)**	**$ 21.6**

Budgets are set and approved based on the best information available at the time of preparation and presentation. Throughout the course of the year, changing operational priorities or unforeseen operational constraints along with pursuing alternate paths and looking for operational efficiencies can lead to actual results that differ from original expectations. In accordance with the *Operational, Discretionary and Statutory Reserve Policy*, financial surpluses generated from operations are used for the benefit of either the District or the function from which the surplus was generated, usually by first avoiding or paying down debt, followed by allocation to reserves to be used for future one-time expenditures or to reduce future tax requisitions, levies or fees to the member municipalities.

At a high level, some of the key 2021 revenue and expenditure trends by entity include the following:

Water District: At this time the Water District is projecting a surplus of close to $0.9 million for 2021 with the delay/deferral of some operating projects, reduced operational expenditures for water treatment and electricity and labour underspends from ongoing recruitment offset by slightly higher debt servicing costs due to higher rates on new borrowing.

Liquid Waste: The lower revenue projections are related to reduced draws from reserves as Liquid Waste Residuals activities, which are funded from reserves, are projecting to be underspent due to delays in the Iona dewatering lagoon construction permit and lower grit production than anticipated. With some residual activities offsetting, the projected operating surplus of $7.4 million is primarily due to the delay of some residuals and minor capital project work, less than budget operations and maintenance costs and labour underspends due to ongoing recruitment offset by slightly higher debt servicing costs due to higher rates on new borrowing.

Solid Waste: Lower projected landfill and waste to energy facility disposal costs, slightly lower debt servicing costs combined with higher projected waste flows offset by slightly less than budget other revenues results in an overall projected surplus of $7.0 million (or $2.6 million more than planned.)

MV Housing Corporation: The projected results of a $2.7 million more than planned budgeted contribution to reserve for the year is primarily a result of realized property tax expenditure savings.

Regional District: At this time, the Regional District functions are projecting a surplus of approximately $3.6 million for the year which is primarily due to projected salary underspends related to ongoing recruitment and reduced expenditures related to certain programs, projects and initiatives as a direct result of the COVID-19 pandemic. Timing of actual expenditures year to date have been slower than that anticipated in the budget and are projected to be lower than budget overall for the year, particularly in General Government Administration, Regional Parks, Regional Planning, Labour Relations (Regional Employer Services), Air Quality and Housing Planning and Policy functional areas.

FINANCIAL INDICATORS

The table below summarizes the list of financial indicators used to show Metro Vancouver's ability to provide services to the region on a sustainable basis. Detailed calculations and explanations are included in Attachment 1.

	2020 Actual	2021 Projected
MVRD Requisition and Utility Levies/Total Revenue	39.8%	39.4%
Debt Service Costs/Total Revenue	16.5%	18.1%
Interest Costs/Total Revenue	5.9%	6.6%
Operating Reserves/Total Revenue	10.6%	6.1%
Total Requisition, Water, Sewer and Solid Waste Charges Per Capita	$272	$286

ALTERNATIVES

This report is provided for information. No alternatives are presented.

FINANCIAL IMPLICATIONS

This report provides information on the projected results of 2021 operations generating an estimated surplus overall of $21.6 million, approximately 2.3% of the overall Metro Vancouver 2021 budget. This projected surplus would be available in future years to either avoid debt or pay for regional projects thereby otherwise reducing the funding requirements.

SUMMARY / CONCLUSION

Financial Services staff work with the departments to review and understand their financial operating results through to the end of the reporting period to establish revenue and expenditure trends and identify issues to be considered in projecting results from operations through to the end of the year. The overall projected surplus is largely due to the deferral of some operating and capital projects, savings from ongoing recruitment, lower miscellaneous operating costs offset by slightly higher than budget debt service costs in Utilities. Overall, the 2021 fiscal year's projected financial results for the Metro Vancouver entities and functions are estimated to be surplus to budget by about $21.6 million.

Attachments:

1. 2021 Financial Performance as of April 30, 2021

45962304

Metro Vancouver Districts

2021 Financial Performance
As of April 30, 2021

July 2021

Table of Contents

METRO VANCOUVER DISTRICTS
SURPLUS TO BUDGET
2021 FINANCIAL PLAN

	2021 ORIGINAL BUDGET	BUDGET ADJUSTMENTS APRIL 2021	2021 AMENDED BUDGET	2021 YEAR-END PROJECTION	2021 PROJECTED VARIANCE
REVENUES					
Water Sales	$ 316,341,192	$ -	$ 316,341,192	$ 316,341,192	$ -
Liquid Waste Services Levy	288,225,540	-	288,225,540	288,225,540	-
Solid Waste Tipping Fees	108,516,645	-	108,516,645	110,162,459	1,645,814
Metro Vancouver Regional District Requisitions	80,939,658	-	80,939,658	80,939,658	-
Compensation Services Revenue	484,531	-	484,531	484,531	-
Collective Bargaining Services Revenue	900,427	-	900,427	900,427	-
Housing Rents	41,303,421	-	41,303,421	41,151,963	(151,458)
Liquid Waste Industrial Charges	11,756,424	-	11,756,424	11,756,424	-
Energy Sales	6,239,530	-	6,239,530	6,239,530	-
Transfer from DCC Reserves	43,145,119	-	43,145,119	42,439,399	(705,720)
User Fees	5,184,946	-	5,184,946	5,274,088	89,142
Housing Mortgage Subsidies	2,099,058	-	2,099,058	2,099,058	-
Non-Road Diesel Permit Fees	1,365,000	-	1,365,000	1,325,055	(39,945)
Regional Global Positioning System User Fees	288,091	-	288,091	288,091	-
Electoral Area Requisition	389,401	-	389,401	389,401	-
Love Food Hate Waste	492,000	-	492,000	492,000	-
Zero Waste Conference	325,000	-	325,000	325,000	-
Other External Revenues	11,537,524	-	11,537,524	11,986,690	449,166
Transfer from Sustainability Innovation Fund Reserve	2,102,001	4,354,882	6,456,883	5,349,949	(1,106,934)
Transfer from Reserves	17,852,993	-	17,852,993	12,783,204	(5,069,789)
TOTAL REVENUES	**$ 939,488,501**	**$ 4,354,882**	**$ 943,843,383**	**$ 938,953,659**	**$ (4,889,724)**
EXPENDITURES					
Operating Programs:					
Greater Vancouver Water District	$ 318,631,748	1,486,934	$ 320,118,682	$ 318,179,624	$ (1,939,058)
Greater Vancouver Sewerage & Drainage District:					
Liquid Waste	353,356,111	1,049,675	354,405,786	341,710,842	(12,694,944)
Solid Waste	118,512,571	-	118,512,571	112,974,148	(5,538,423)
Metro Vancouver Housing Corporation	53,692,021	-	53,692,021	50,859,511	(2,832,510)
Metro Vancouver Regional District					
Air Quality	11,683,020	877,667	12,560,687	12,023,187	(537,500)
E911 Emergency Telephone Service	4,633,573	-	4,633,573	4,633,573	-
Electoral Area Service	678,891	-	678,891	672,891	(6,000)
General Government Administration	5,681,876	-	5,681,876	5,183,787	(498,089)
General Government Zero Waste Collaboration Initiatives	1,660,020	-	1,660,020	1,660,020	-
Housing Planning and Policy	6,221,486	333,426	6,554,912	6,509,912	(45,000)
Regional Economic Prosperity	1,530,000	-	1,530,000	1,528,000	(2,000)
Regional Emergency Management	228,945	-	228,945	228,945	-
Regional Employer Services	3,102,235	-	3,102,235	2,943,235	(159,000)
Regional Global Positioning System	324,719	-	324,719	294,719	(30,000)
Regional Parks	54,561,963	323,410	54,885,373	52,806,969	(2,078,404)
Regional Planning	3,855,768	283,770	4,139,538	4,022,538	(117,000)
Sasamat Fire Protection Service	1,133,554	-	1,133,554	1,133,554	-
	95,296,050	1,818,273	97,114,323	93,641,330	(3,472,993)
TOTAL EXPENDITURES	**$ 939,488,501**	**$ 4,354,882**	**$ 943,843,383**	**$ 917,365,455**	**$ (26,477,928)**
			2021 ACTUAL SURPLUS TO BUDGET		$ 21,588,204

Metro Vancouver Districts
2021 Financial Performance
District Summaries

Greater Vancouver Water District

Water District revenues overall to the end of April came in at close to $0.4 million more than budget. This was partly due to water consumption levels being approximately 0.18% more than budget through to the end of April. Water consumption in the region, and therefore water sales, are greatly impacted by weather. However, it is estimated the water sales revenue surplus to date will be eliminated by yearend assuming consumption levels stay close to budget for the remaining months of the year and there are no further anticipated COVID-19 pandemic impacts. Projected revenue shortfall of approximately $1.1 million pertains primarily to the delay of several Board approved Sustainability Innovation Fund (SIF) projects that are directly funded by reserves.

Water District expenditures are currently trending lower than budget due primarily to delays in some projects, reduced chemical usage (due to favourable water quality) and lower electricity usage. Projecting to yearend, expenditures on operations are expected to be less than budget by approximately $2.0 million, largely the result of the delay and deferral of some projects due to the impacts of the ongoing COVID-19 pandemic, lower projected expenditures for water treatment and electricity costs and underspends from position vacancies where recruitment efforts continue offset by slightly higher than budgeted debt servicing costs due to higher new borrowing rates.

Water District is currently projecting an overall surplus of approximately $0.9 million for the year.

Greater Vancouver Sewerage and Drainage District

❖ **Liquid Waste**

Through to the end of April, the function is seeing some delays in operational expenditures for residuals costs, delays in some minor capital project work along and slightly lower operations and maintenance costs offset by slightly higher than budget debt servicing costs due to borrowing rates.

Projecting to yearend, Liquid Waste is anticipating surplus to budget on expenditures of approximately $12.7 million. This is primarily due to delayed minor capital projects in the Project Delivery program (close to $2 million) and Liquid Waste Residuals activities, which is in the Managements Systems and Utility Services program, is currently projecting to be underspent by close to $9 million primarily due to delays in the Iona dewatering lagoon construction permit and lower grit production than anticipated and lower than expected operations and maintenance costs (close to $1.2 million). Also, there are some projected salary underspends in several program areas where recruitment efforts are ongoing offset by some slightly higher than budgeted debt servicing costs.

Revenues are projected to be lower than budget by $5.3 million due primarily to the deferral of the Iona lagoon dewatering work to 2022 in Liquid Waste Residuals that was to be funded by reserves.

At this time, Liquid Waste is projecting an overall surplus of just under $7.4 million (2.0% of budget) due primarily to the residuals and minor capital project activities projected to be less than budget. The overall projected surplus is being generated in the following defined geographical areas of the Region as follows: Vancouver Sewer Area $2.0 million, North Shore Sewer Area $1.0 million, Lulu Island Sewer Area $0.8 million, Fraser Sewer Area $3.5 million and the Drainage Areas $0.1 million.

❖ **Solid Waste**

The Solid Waste function is projecting a yearend surplus of close to $7.0 million (or $2.6 million higher than the planned surplus of $4.4 million.) Disposal costs are projected to be lower by about $1.0 million due to reduced landfill and Waste-to-Energy Facility costs and debt servicing costs are projected to be less than budget by $0.1 million due to favourable borrowing rates/interest costs.

On the revenue side, projected higher waste flows in the Region (approximately 900K tonnes versus budgeted tonnage of 860K) are driving an increase in expected net user fees of $1.6 million greater than budget, offset by net miscellaneous sundry revenues projected less than budget by $0.1 million.

Metro Vancouver Housing Corporation (MVHC)

Total forecasted contribution to reserves for the Metro Vancouver Housing Corporation in 2021 is expected to be $12.0M, which is $2.7M over the budgeted amount. In 2020, the Property Assessment Appeal Board of British Columbia ruled that a number of MVHC properties were exempt from paying property taxes. Based on this ruling, there will be a savings of $2.8M in property tax expense for 2021. All other programs are expected to come in on budget for 2021.

Tenant rental revenue is expected to be below budget due to the cancellation of rent increases through to the end of 2021. The vacancy rate is higher than expected for 2021 as limitations due to COVID-19 have resulted in slower than expected unit turnovers.

The 2021 capital replacement program has an annual budget of $9.5M, of which $1.7M has been spent at the end of April, with a total of $5.1M in total actuals and commitments. The program is expected to come in on budget for 2021.

The capital development program with an annual budget of $39.6M, has spent $600K at the end of April. Construction at Kingston Gardens and Welcher Avenue are expected to begin in late fall 2021.

Metro Vancouver Regional District

The Regional District functions is projecting a surplus of approximately $3.6 million for the year which is primarily due to projected salary underspends related to ongoing recruitment and reduced expenditures related to certain programs, projects and initiatives as a direct result of the pandemic this year. Related to the Regional District's budgets for the year, the COVID-19 pandemic is having impacts on expenditures to date and are expected to be lower than anticipated overall for the year, particularly in several programs located in General Government Administration, Regional Parks, Regional Planning, Labour Relations (Regional Employer Services), Air Quality and Housing Planning and Policy.

❖ **Air Quality**

Air Quality is projecting a year end surplus of close to $500,000 primarily due to the expectation of reduced legal and NRDE (Non-Road Diesel) program costs.

❖ **E911 Emergency Telephone**

E911 is projected to be on budget by year end.

❖ **Electoral Area Services**

Electoral Area Services is expecting to be on budget at year end.

❖ **General Government Administration**

The function is expected to be in a surplus position of $598,000 at yearend as a result of lower than budgeted expenditures relating to projects and initiatives delayed due to COVID-19 pandemic factors.

❖ **General Government Zero Waste Collaboration Initiatives**

General Government Zero Waste Collaboration Initiatives is expected to be on budget at year-end.

❖ **Housing Planning and Policy**

The Housing Planning and Policy program is projecting a surplus of close to $92,000 due to salaries savings and cost-sharing of development planning expenses with the City of New Westminster.

❖ **Labour Relations (Regional Employer Services)**

The Labour Relations function is projecting a surplus of approximately $99,000 for the year due to ongoing recruitment and limited activity due to the COVID-19 pandemic.

❖ **Regional Economic Prosperity**

Regional Economic Prosperity is expected to be on budget for the year

❖ **Regional Emergency Management (REM)**

Regional Emergency Management is expected to be on budget for the year.

❖ **Regional Global Positioning System (GPS)**

The Regional Global Positioning function is projecting a year end surplus of approximately $30,000. The primary driver for this expected surplus is less than budget forecasted expenditures for the year.

Regional Parks

By the end of the year, Regional Parks is expected to be in a surplus position of close to $2,126,000. This is primarily due to litigation at Colony Farm being delayed and significant legal costs will be postponed to 2022. Furthermore, savings in labour are expected due to a few vacant positions and camping revenues are expected to increase due to overwhelming public demand for the outdoors during the pandemic.

❖ **Regional Planning**

The function expects a $117,000 surplus at year end mainly due to ongoing recruitment and unexpected revenue from a partnership account.

❖ **Sasamat Fire Protection Service**

The Sasamat Fire Protection Service is expected to be on budget at year end.

Centralized Support Programs

Centralized Support Programs are expecting a surplus of close to $2.9 million on an overall budget of $83.8 million in 2021. Specific comments for each of the centralized support areas are set out below:

❖ **External Relations**

External Relations is projecting a surplus for the year of approximately $130,000 due to ongoing recruiting.

❖ **Human Resources**

Human Resources is projected to have a surplus of close to $141,000 by year end due to ongoing recruiting and being underspent on travel/training/tuition as a result of COVID-19.

❖ **Financial Services**

Financial Services is projecting a year end surplus of close to $337,000 due primarily to ongoing recruiting.

❖ **Indigenous Relations**

Indigenous Relations is projected to have a yearend surplus of about $38,000 due to ongoing recruiting.

❖ **Legislative Services**

Legislative Services is expecting a $36,000 surplus primarily due to ongoing recruiting for a staff vacancy for part of the year.

❖ **Corporate Services**

Head Office is projecting an overall deficit of approximately $151,000 due to decreased parking revenue as a result of the COVID-19 pandemic. In addition, some unexpected projects such as the lighting upgrade to enhance energy efficiency, capacity renovations, and lockers for shared work spaces will occur this year. These expenses will be mostly reserve funded and the lighting project will receive a grant from BC Hydro and be partially recovered from tenants.

IT Services is projecting a surplus of approximately $140,000 due to Digital Strategy projects being postponed to 2022.

Fleet Services is projecting a surplus of $2,226,000 due to procurement delays in vehicle and equipment acquisitions and replacements.

Corporate Security & Emergency Management is expected to be on budget for the year.

Corporate Safety is expecting a surplus of $25,000 to due reduced delivery of Safety training courses due to COVID.

Metro Vancouver Districts
Financial Indicators

These ratios are intended to help indicate the Metro Vancouver Districts' financial ability to continue to provide services to the region on a sustainable basis. This involves evaluating a number of factors, including the ongoing ability to ensure revenues meet expenditures, ability to meet debt obligations, and the flexibility to address unexpected contingencies. Forecast ratios can help to identify potential financial problems in advance.

1) MVRD Requisition and Levies / Total Revenue

This ratio is a measure of the diversification of revenues. A high ratio indicates a reliance on property tax related levies / fees. A low ratio illustrates a greater range of revenues which is seen as beneficial. However, other revenue streams may not be sustainable or fluctuate more than tax requisitions.

	2018 Actual		2019 Actual		2020 Actual		2021 Budget		2021 Projected	
Total Property tax/levies	$291,309,226	37.7%	$317,365,717	38.1%	$346,393,945	39.8%	$369,554,599	39.2%	$369,554,599	39.4%
Total Revenue*	$771,746,665		$834,011,157		$869,875,032		$943,843,383		$938,953,659	

The Metro Vancouver has a reasonably well diversified revenue base. Some revenue streams such as Water Sales and Solid Waste User Fees are subject to fluctuations during the year.

2) i) Debt Service Costs/ Total Revenue

This is the percentage of revenue committed to payment of interest and principal on temporary and long-term debt for the regional, sewer, solid waste, water and housing operations. A high percentage indicates greater use of revenues for the repayment of debt, and less ability to adjust to unplanned events and changing circumstances.

	2018 Actual		2019 Actual		2020 Actual		2021 Budget		2021 Projected	
Debt Service Costs	$131,430,401	17.0%	$137,166,682	16.4%	$143,344,968	16.5%	$170,361,333	18.0%	$170,371,682	18.1%
Total Revenue*	$771,746,665		$834,011,157		$869,875,032		$943,843,383		$938,953,659	

**2021 Budget includes budgeted reserve items, surplus carry-forward items or other additional reserve applications as approved by the Board.*

2) ii) Interest Costs/ Total Revenue

This is the percentage of revenue committed to payment of interest on temporary and long-term debt for the regional, sewer, solid waste and water operations. A high percentage indicates greater use of revenues for servicing interest on outstanding debt, and less ability to adjust to unplanned events and changing circumstances.

	2018 Actual		2019 Actual		2020 Actual		2021 Budget		2021 Projected	
Interest Costs	$47,625,913	6.2%	$46,756,655	5.6%	$51,098,095	5.9%	$61,485,868	6.5%	$61,734,025	6.6%
Total Revenue*	$771,746,665		$834,011,157		$869,875,032		$943,843,383		$938,953,659	

Both the overall debt service costs for the year and interest costs for the year and as a percentage of revenue are up slightly when compared to current budget due to primarily to more costs generated by higher rates for both new borrowing and for refinancing of some existing debt.

3) Operating Reserves/ Total Revenues

Reserve levels are an indicator of financial strength since they provide the ability to meet unforeseen expenditures or revenue losses.

	2018 Actual		2019 Actual		2020 Actual		2021 Budget		2021 Projected	
Operating Reserves	$81,173,432	10.5%	$66,205,956	7.9%	$92,459,857	10.6 %	$56,865,984	6.0%	$56,865,984	6.1%
Total Revenue*	$771,746,665		$834,011,157		$869,875,032		$943,843,383		$938,953,659	

As per the *Operating, Discretionary and Statutory Reserve Policy,* operating reserves are set to be a factor of the operating budgets for each of the functions to adequately meet potential unexpected contingencies.

**2021 Budget includes budgeted reserve items, surplus carry-forward items or other additional reserve applications as approved by the Board.*

4) Total MVRD Requisition, Water, Sewer and Solid Waste Charges / Per Capita

This indicator is a representation of the per capita cost impact of the regions tax payer supported services. These costs are passed on to the tax payer through our member municipalities. For budget purposes, the 2021 population was assumed to increase at a rate of 1.5% growth over 2020 based on the February 2021 issued population statistics.

	2018 Actual	Per Capita	2019 Actual	Per Capita	2020 Actual	Per Capita	2021 Budget	Per Capita	2021 Projected	Per Capita
Total Tax Revenue **	$667,977,139	$251	$708,374,482	$262	$745,054,922	$272	$794,412,436	$286	$796,058,250	$286
Total Population ***	2,658,594		2,706,792		2,737,681		2,778,746		2,778,746	

The projected increase in the actual revenues over 2021 budget is primarily a result of an increase in projected revenues for Solid Waste User Fees.

**2021 Budget includes budgeted reserve items, surplus carry-forward items or other additional reserve application approved by the Board.*

***Total Tax Revenue is defined as MVRD Tax Requisitions, Water Sales, Sewerage & Drainage Levies and Solid Waste User Fees.*

****Actual Populations are based on the Demographic Analysis Section, BC Stats, Ministry of Citizens' Services, Government of British Columbia, February 2021.*

To: Performance and Audit Committee

From: Joe Sass, Director Financial Planning and Operations/Deputy CFO

Date: June 14, 2021 Meeting Date: July 7, 2021

Subject: **Investment Position and Returns – March 1, 2021 to May 31, 2021**

RECOMMENDATION

That the Performance and Audit Committee receive for information the report dated June 14, 2021 titled "Investment Position and Returns – March 1, 2021 to May 31, 2021".

EXECUTIVE SUMMARY

The annualized return for Metro Vancouver's investment portfolio in 2021 at the end of May was 1.03% for Short-Term, 2.18% for Long-Term and 2.26% for the Cultural Reserve Fund. Investment performance has met expectations for the current period. Due to the timing of the committee meeting, results and balance information cover a three-month period from March through May.

Interest rates are expected to remain low for the balance of the year. Metro Vancouver's overall rate of return will continue to be pressed lower in the near term as a significant portion of the portfolio is kept in short-term products and held in cash for liquidity.

PURPOSE

To report investment performance and related economic information for receipt by the Committee.

BACKGROUND

Investment updates are brought to the Committee to keep members informed on important updates relating to Metro Vancouver's investments. The *Corporate Investment Policy* requires that an investment update report be presented to the Committee three times per year. The period covered by the report will vary depending on the timing of the committee meeting. The current report includes balance and information to the end of May 2021.

INVESTMENT CATEGORIES

Short term investments have terms of less than one year at the time of investment. These may include Bankers' Acceptances, Canadian Bank Bonds and Credit Union Term Deposits.

Long term investments have terms greater than one year at the time of investment. These investments may include Canada, Provincial, and Canadian Bank bonds, Guaranteed Investment Certificates, Credit Union Term Deposits greater than one year and MFA pooled funds.

Cultural Reserve investments are long term investments whose revenues have been set aside to fund Metro Vancouver's annual contributions to cultural activities.

OVERALL INVESTMENT RETURNS

Table 1

2021 SUMMARY OF INVESTMENT RESULTS				
PERIOD	SHORT TERM*	LONG TERM	CULTURAL RESERVE	TOTAL**
January	0.08%	0.20%	0.21%	0.13%
February	0.08%	0.17%	0.17%	0.12%
March	0.09%	0.18%	0.19%	0.13%
April	0.09%	0.18%	0.18%	0.13%
May	0.09%	0.18%	0.19%	0.13%
2021 Annualized Estimate	**1.03%**	**2.18%**	**2.26%**	**1.53%**

* Includes cash and high-interest savings account balances

**Weighted average return of short-term, long-term and cultural reserve fund

Short Term Investment Performance

As at May 31, 2021, the short term portfolio held a total of $102.5 million (at historic cost/book value) and represented 29.6% of total investments.

Appendix 1 details performance during the period compared to benchmarks. The Short Term portfolio's performance exceeded all benchmarks for the period.

The estimated annualized yield at the end of May 2021 is 1.03% compared to 0.96% reported at the end of February. The increase is due to maturities being re-invested for longer dated term closer a year for yield premium.

Long Term Investment Performance

As at May 31, 2021, the long term portfolio held a total of $241.8 million (at historical cost/book value) representing 69.8% of all investments.

Appendix 2 details performance during the period compared to our benchmarks. The Long Term portfolio's performance exceeded all benchmarks for the period.

The estimated annualized yield for the Long Term portfolio in 2021 is 2.18% compared to 2.22% reported at the end of February. The slight decrease is due to certain long dated securities with higher yields reaching maturity.

Culture Reserve Investment Performance

Cultural Reserve portfolio held $2.2 million (at historical cost/book value) in fixed income investments representing 0.6% of total investments. Estimated annualized yield for 2021 is 2.26% compared to 2.28% at the end of March.

Investment Holdings and Limits

Investments by counterparty as percentage of the total portfolio and the maximum limits per the policy have been included in Appendix 4.

The portfolio is currently heavily weighted in financial institutions, mostly held in cash, due to the significant cash demands of the capital program and limited short-term investment options with comparable returns.

Looking at the "days to maturity" for all investments including cash, 19.2% will mature in the next 12 months and 15.7% will mature beyond 12 months. The remaining 65.1% are held in HISA and is fully liquid. The expected maturity by sector can be found in Appendix 3 of this report.

ONGOING MATTERS – COVID-19

Environmental, Social and Governance (ESG)

As part of the investment policy approved on November 27, 2020, staff committed to providing an update on the Environmental, Social and Governance (ESG) investing environment to inform the continued evolution of the Metro Vancouver investment policy.

Rating agencies in Canada have started incorporating ESG considerations as part of their review. In the recent ratings report for the Municipal Financing Authority (MFA), Fitch has assigned MFA an ESG credit relevant score of '3' which means ESG issues are credit-neutral or have only a minimal credit impact to the entity. Moody's has determined that MFA's exposure to all 3 factors, environment, social and governance risks, was low. S&P did not address ESG considerations but made a reference to the fact that MFA has begun providing disclosures around ESG footprint and mapping its bond proceeds to the US Sustainable Goals. Although ESG consideration is becoming more common, it is still challenging to apply them practically for investment purposes given the lack of standardization in scoring and reporting. Even between Fitch and Moody's, their methodology for scoring is different. Moreover, the scoring process remains largely qualitative, informed by subjective data that entities choose to release.

Nevertheless, there is progress being made in the measurement of ESG data as this topic continues to gain popularity among investors. Staff continue to closely monitor the development in this space.

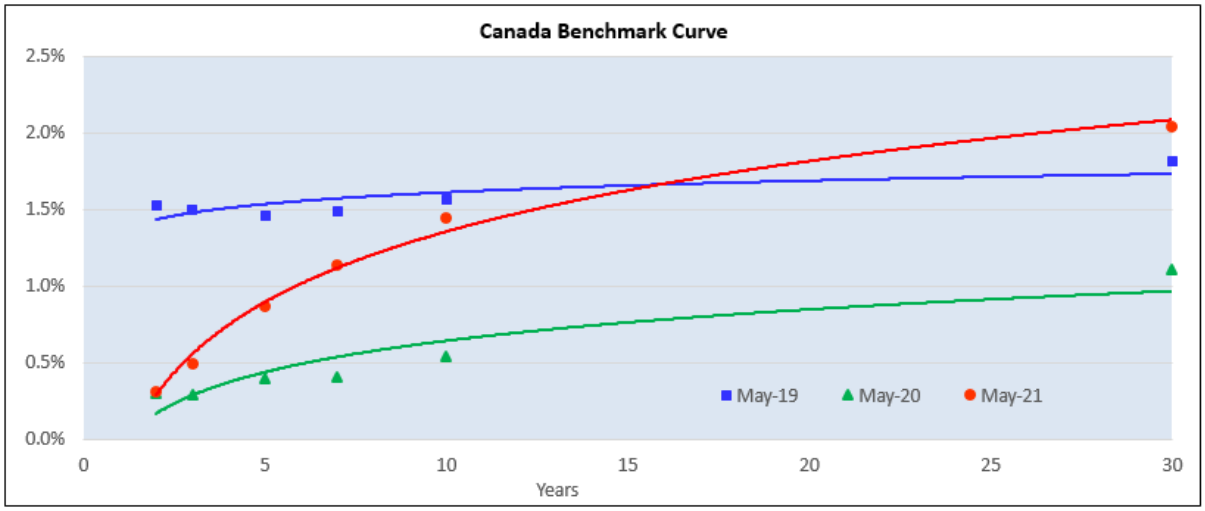
Current Economic Impacts

The Bank of Canada held its key interest rate at its effective lower bound of 0.25%. With vaccinations ramping up and COVID cases falling, the economy may experience a strong rebound this summer led by consumer spending. While the Bank maintains that rising inflation is more transitory and will remain "near 3 percent through the summer" before easing later in the year, consumer price index (CPI) reached 3.6% in May with notable increase in many consumer prices due to surging commodity prices and global supply-chain bottlenecks. There is increased expectation from the market that the Bank may hike rates earlier than expected in 2022.

The US Federal Reserve also kept its interest rates unchanged at a range of 0-0.25%. They indicated two rate hikes by the end of 2023 given the strong economic growth, faster inflation and labor market progress. Despite the continued inflationary pressures, the Federal Reserve reiterated their commitment to maintain a highly accommodative monetary policy as they remain cautious about the recovery. The core inflation, which excludes more volatile items such as food and energy, rose to 3.8% in May up from 3.0% in April.

As illustrated in Table 2 below, the yield curve steepened with longer duration bond yields rising due to increasing inflation expectations and anticipation of economic recovery. At the end of May, 10 year Canada benchmark bond traded around 1.5% in 2021 compared to 0.5% in 2020 and 1.6% in 2019. The short end of the curve is expected to remain low for some time yet while the long end of the curve may rise further in the near term.

Table 2



Metro Vancouver's investment approach is to ensure the portfolio remains liquid and holds only the highest quality products to ensure safety of capital. Although the curve has steepened, staff remain cautious about moving farther out the curve as the rates are expected to move higher with potential rate hike by the central bank as early as next year in 2022. Given the cash demands of the capital program and the uncertainty in the market, Metro Vancouver's portfolio remains focused on shorter term products with a higher cash balance at this time. Staff are looking into a strategy to minimize the overall opportunity cost across the organization.

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

FINANCIAL IMPLICATIONS
Overall portfolio returns remain modest, a reflection of the priorities of preservation of capital and maintaining the necessary liquidity to meet operational requirements.

CONCLUSION
Overall, investment performance for the period, while modest, met expectations. Both the short term and long term investments exceeded returns on our benchmarks. Metro Vancouver's portfolios hold quality investments and are reasonably positioned to withstand the current market volatility. The overall rate of return is expected to trend lower in the next several months as a significant portion of portfolio will be placed in short-term products and held in cash for liquidity.

Attachments:
Appendix 1 – Short Term Portfolio – Investment Results and Comparison to Benchmarks
Appendix 2 – Long Term Portfolio – Investment Results and Comparison to Benchmarks
Appendix 3 – Investment Maturity Charts
Appendix 4 – Investment Holdings and Maximum Limit

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APPENDIX 1

INVESTMENT RESULTS - SHORT TERM PORTFOLIOS 2021 Comparison to Benchmarks				
	SHORT TERM*	**ONE MONTH B/A****	**THREE MONTH B/A****	**MFA MONEY MARKET FUND**
January	0.08%	0.02%	0.02%	0.02%
February	0.08%	0.01%	0.01%	0.01%
March	0.09%	0.01%	0.02%	0.01%
April	0.09%	0.01%	0.02%	0.01%
May	0.09%	0.01%	0.02%	0.01%
2021 Annualized Estimate	**1.03%**	**0.18%**	**0.19%**	**0.14%**

* Includes cash and high-interest savings account balances

** Per IIROC BA Rate History

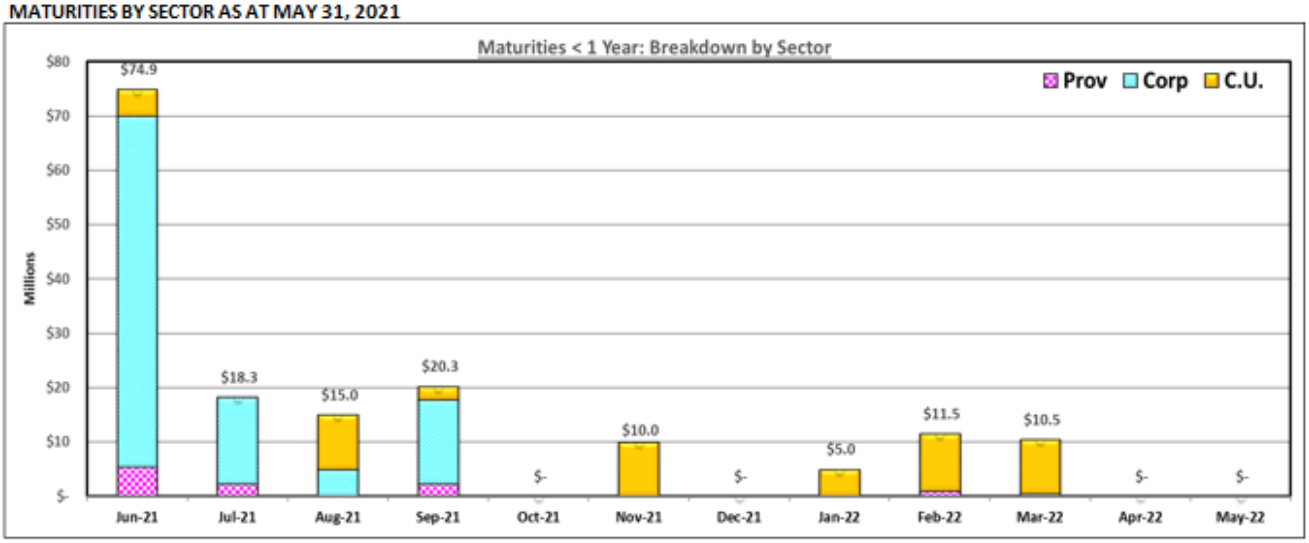
APPENDIX 2

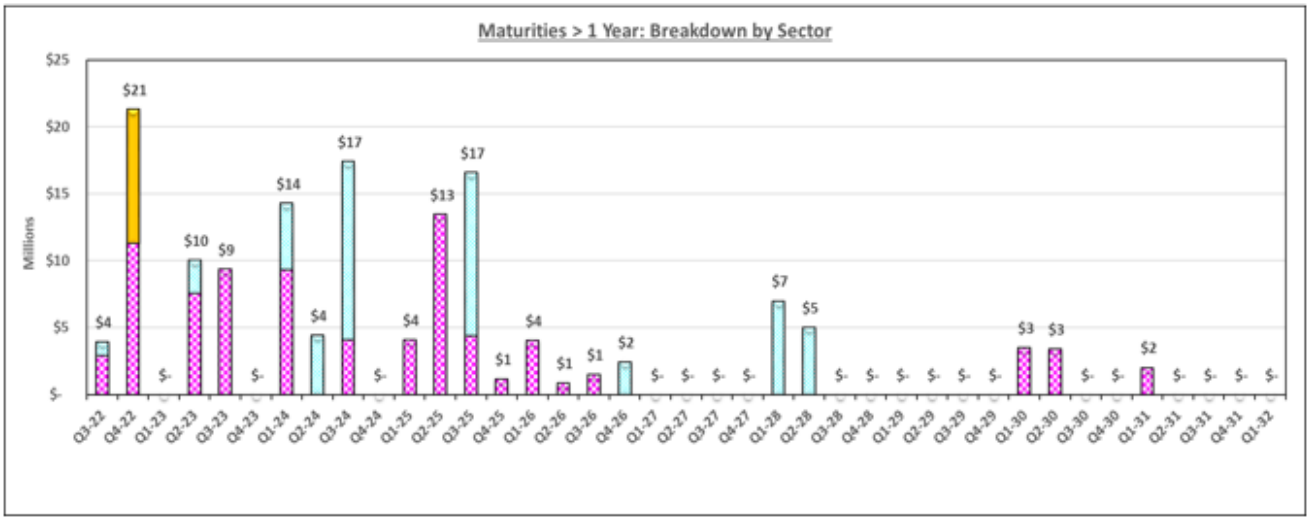
2021 INVESTMENT RESULTS - LONG TERM PORTFOLIOS Comparison to Benchmarks				
PERIOD	**LT PORTFOLIO**	**CULTURAL RES**	**MFA GOVT FOCUSED ULTRA-SHORT BOND FUND (YTM*)**	**MFA BOND FUND (YTM*)**
January	0.20%	0.21%	0.02%	0.05%
February	0.17%	0.17%	0.03%	0.07%
March	0.18%	0.19%	0.02%	0.07%
April	0.18%	0.18%	0.03%	0.07%
May	0.18%	0.19%	0.02%	0.07%
2021 Annualized Estimate	**2.18%**	**2.26%**	**0.29%**	**0.82%**
Average term-to-maturity	**2.32 Years**	**2.60 Years**	**0.86 Years**	**2.38 Years**

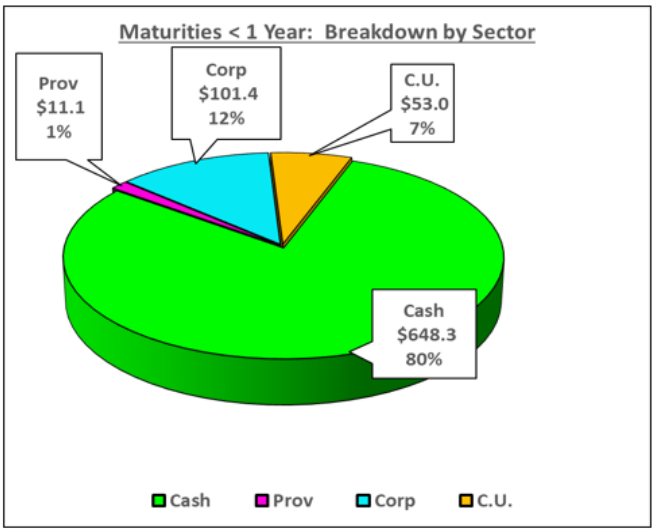
*Starting October 2020, MFA is no longer providing Average Yield in their monthly performance reports. Instead, MFA discloses the Yield to Maturity (YTM) which is the total return anticipated if securities held in the fund are held until maturity.

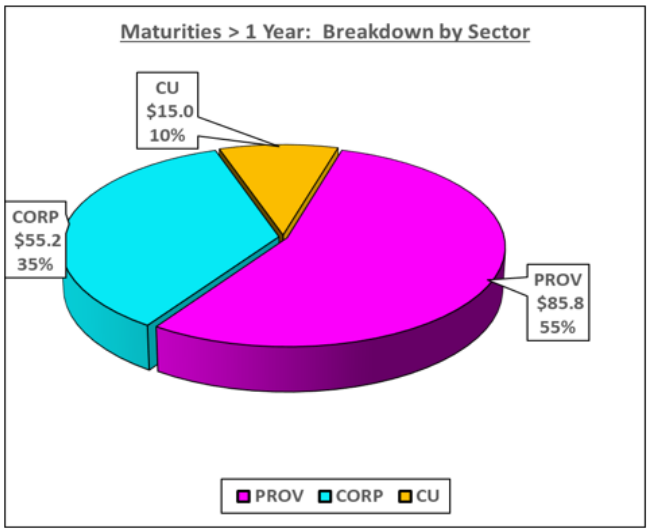
APPENDIX 3

MATURITIES BY SECTOR AS AT MAY 31, 2021









APPENDIX 4

METRO VANCOUVER
INVESTMENT HOLDINGS AND LIMITS AS AT MAY 31, 2021

	(% of total portfolio)	
	Corporate Policy Limit	Investments as at May 31, 2021
Canada	100.0%	0.0%
Provinces rated AA- or better by S&P (or equivalent)		
British Columbia	50.0%	0.0%
Saskatchewan	50.0%	0.0%
Provinces rated A- or better by S&P (or equivalent)		
Alberta	30.0%	0.0%
New Brunswick	30.0%	0.2%
Ontario	30.0%	2.3%
Quebec	30.0%	4.2%
Manitoba	50.0%	1.1%
Nova Scotia	30.0%	0.3%
Newfoundland	30.0%	0.7%
Prince Edward Island	30.0%	0.0%
Subtotal	50.0%	8.79%
Municipal Finance Authority of BC	15.0%	1.9%
Government Term 11-30 years	5.0%	*0.0%*
SCHEDULE I/II BANKS		
Bank of Montreal	20.0%	10.0%
Bank of Nova Scotia	20.0%	18.0%
CIBC	20.0%	6.0%
Royal Bank of Canada	20.0%	13.9%
TD Bank	20.0%	9.0%
HSBC Bank Canada	15.0%	1.3%
National Bank of Canada	15.0%	14.9%
Manulife Bank	15.0%	0.0%
Canadian Western Bank	15.0%	7.3%
BC CREDIT UNIONS		
Vancity	20.0%	5.3%
CoastCapital	20.0%	0.0%
Westminster Credit Union	20.0%	0.5%
Blueshore	20.0%	2.5%
First West	20.0%	0.8%
Prospera	20.0%	0.0%
G&F Financial	20.0%	0.0%
Subtotal	50.0%	9.0%
BC Credit Union Long 2-5 years	30.0%	0.0%
Caisse Central Desjardins	5.0%	0.0%

To: Performance and Audit Committee

From: Roy Moulder, Director, Purchasing and Risk Management
Financial Services Department

Date: June 24, 2021 Meeting Date: July 7, 2021

Subject: **Tender/Contract Award Information – March 2021 to May 2021**

RECOMMENDATION

That the Performance and Audit Committee receive for information the report dated June 24, 2021 titled "Tender/Contract Award Information – March 2021 to May 2021".

EXECUTIVE SUMMARY

During the period March 1, 2021 and May 31, 2021, the Purchasing and Risk Management Division issued fifteen (15) new contracts, each with a value in excess of $500,000 (exclusive of taxes). In addition, there were six (6) existing contracts requiring contract amendments which necessitate further reporting to the Performance and Audit Committee. All awards and amendments were issued in accordance with the *"Officers and Delegation Bylaws 1208, 284 and 247 – 2014"* and the *"Procurement and Real Property Contracting Authority Policy".*

PURPOSE

To provide the Performance and Audit Committee information with regard to contracts, handled through the Purchasing and Risk Management Division, with a total anticipated value at or in excess of $500,000 (exclusive of taxes).

BACKGROUND

The Purchasing and Risk Management Division of Metro Vancouver awards contracts for goods, services and construction in accordance with the *"Officers and Delegation Bylaws 1208, 284 and 247 – 2014" (Bylaws)*, and the *"Procurement and Real Property Contracting Authority Policy" (Policy)* adopted by the Board of Directors on July 11, 2014, effective September 1, 2014. These *Bylaws* and *Policy* outline thresholds for competitive bidding and contracting authorities. Contracts in excess of $500,000 will be reported to the Performance and Audit Committee to align with the thresholds outlined in the Policy.

Capital projects may result in the awarding of one or more contracts to complete the project. All contracts are always within budget authority.

NEW CONTRACTS - $500,000 to $5,000,000

The following contracts were **awarded** during the months of *March 2021 to May 2021*
(Details attached as **APPENDIX A**):

		(Exclusive of taxes)	
1.	Utility Systems Technologies, Inc. RFP No. 20-072 *Supply and Delivery of Two Dynamic Voltage Restorers (DVR) at Lulu Island Wastewater Treatment Plant*	$782,660 USD	GVS&DD

2.	Dell Technologies Inc. RFP No. 20-359 *Supply of Desktop & Laptop Computers and Servers*	$3,598,425	MVRD
3.	Jacob Bros. Construction Inc. Tender No. 21-053 *Little Mountain Reservoir Roof Upgrade*	$755,957	GVWD
4.	Talon Helicopters Ltd. RFP No. 20-381 *Helicopter Services*	$1,335,100	GVWD
5.	Colliers Project Leaders Inc., Parsons Inc., RAM Engineering Ltd., R.F. Binnie & Associates Ltd. RFP No. 20-308 *Liquid Waste Services Design and Construction Projects - Project Management Services*	$4,000,000	GVS&DD
6.	Ward and Burke Microtunnelling Ltd. Tender No. 21-020 *Construction Services – Microtunnelling of the Albert St. Sanitary Trunk Sewer Phase 2 – Barnet Hwy Section*	$4,885,113	GVS&DD
7.	New City Contracting Ltd. Tender No. 21-028 *Building Envelope Rehabilitation - Kelly Court*	$3,651,954	MVHC
8.	United Rental of Canada Inc. Tender No. 21-030 *Supply, Installation, Commissioning and Maintenance of Two Rental Gensets*	$1,289,149	GVS&DD
9.	Vancouver Pile Driving Ltd. Tender No. 21-076 *Construction Services for Seymour Middle-Lake Debris Boom*	$1,660,950	GVWD

NEW CONTRACTS – BOARD APPROVED

The following contracts were **authorized for execution** by the GVS&DD and GVWD Boards of Directors during the months of *March 2021 to May 2021* (as such no further information is included in this report):

		(Exclusive of taxes)	
1.	Stasuk Testing and Inspection Ltd. RFP No. 20-143 *Inspection Services at Solid Waste Regional Facilities*	$3,674,026	GVS&DD

2.	AECOM Canada Ltd. RFP No. 14-205 *Consulting Services for the North Shore Wastewater Treatment Plant*	$7,118,094	GVS&DD
3.	AECOM Canada Ltd. RFP No. 14-230 *Consulting Engineering Services for the Design and Construction of Gilbert Trunk Sewer Twinning – Phase C2 Engineering Construction Services (South Section)*	$2,548,446	GVS&DD
4.	Arrow Transportation Systems Inc. RFP No. 20-016 *Organics Management at the North Shore Transfer Station*	$17,428,425	GVS&DD
5.	Bennett Mechanical Installations (2001) Ltd. Tender No. 20-154 *Pebble Hill Reservoir Unit No. 1 & 2 Seismic Upgrades*	$7,062,500	GVWD
6.	Oscar Renda Contracting of Canada RFP No. 20-349 *New Westminster Interceptor - Columbia Section Rehabilitation by Sliplining*	$26,219,750	GVS&DD

AMENDED CONTRACT

There were no **'not previously reported'** contracts **amended** during the months of *March 2021 to May 2021* (**APPENDIX B**).

The following **previously reported** contracts were **amended** during the months of *March 2021 to May 2021* (Details attached as **APPENDIX C**):

		Value of Amendments	Total Amended Value of Contract
1.	Traylor-Aecon General Partnership RFP No. 18-048 *Construction – Second Narrows Water Supply Tunnel Burrard Inlet Crossing*	$27,171,143	$293,730,575
2.	Northwest Pipe Company RFP No. 19-371 *Supply and Delivery of Steel Pipe for 2020 Water Services Construction Projects*	$2,180,288	$19,711,686

3.	Katzie Development Limited Partnership Sole Source No. 18-163 *Archaeological Monitoring for Geotechnical Exploration for the Northwest Langley Wastewater Treatment Plant Projects*	$576,782	$2,022,588
4.	Morrison Hershfield Ltd. RFP No. 17-030 *Consulting Engineering Services for the Design and Construction Administration of the Coquitlam Transfer Station*	$553,886	$8,945,500
5.	NAC Constructors Ltd. ITT No. 16-034 *Sapperton Pump Station Replacement Project*	$4,270,932	$47,059,449
6.	Brown and Caldwell Consultants Canada Ltd. RFP No. 11-113 *Annacis Island Wastewater Treatment Plant (AIWWTP) Stage 5 Expansion - Engineering Services*	$9,296,456	$72,225,382

COMPETITIVE SELECTION PACKAGES - anticipated to be greater than $500,000 (Issued but not awarded) (Details attached as **APPENDIX D**).

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

FINANCIAL IMPLICATIONS
The contract approval process includes a review of available budget. The contracts presented herein are consistent with budget authority provided by the respective Boards.

CONCLUSION
The contracts presented herein were awarded in accordance with the *"Officers and Delegation Bylaws 1208, 284 and 247 – 2014" (Bylaws)* and the *"Procurement and Real Property Contracting Authority Policy" (Policy)* and comply with competitive bidding laws and applicable legislation.

Further, the competitive selection packages were carefully crafted by teams of subject matter experts resulting in the award of contracts that are fiscally responsible, and balance risk, economic, ethical and legal obligations.

Attachments

APPENDIX A: Information with regard to newly awarded contracts - $500,000 to $5,000,000.

APPENDIX B: Contract amended to a value of more than $500,000 but not previously reported to the Performance and Audit Committee [no contracts reported]

APPENDIX C: Previously reported contracts that have been amended.

APPENDIX D: Competitive Selection Packages anticipated to be greater than $500,000 (Issued but not awarded).

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Appendix A
No. 1

AWARD OF CONTRACT

RFP No. 20-072

1. A contract was awarded, February 24, 2021 for the **Greater Vancouver Sewerage and Drainage District.**

   To: ***Utility Systems Technologies, Inc.***

   in the anticipated amount of up to **$782,660 USD** (exclusive of taxes) for Supply and Delivery of Two Dynamic Voltage Restorers (DVR) at Lulu Island Wastewater Treatment Plant. The anticipated amount is a combination of the successful consultants' proposed price of $699,400 USD (exclusive of taxes) and an additional $83,260 USD (exclusive of taxes) to account for issues identified during negotiations as allowed for in the RFP.

   The contract price is within the overall budget.

2. Proponents were invited by Metro Vancouver's and BC Bid websites and private invitation on June 12, 2020.

   Closing Date: July 8, 2020

3. Proposals received (exclusive of taxes):

Utility Systems Technologies, Inc.	$699,400 USD
Omniverter Inc.	$1,540,585 CAD

4. Proposals reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Liquid Waste Services Department Staff

5. Award was made to the highest ranked proponent and lowest cost based on the evaluation criteria established in the RFP.

Appendix A
No. 2

AWARD OF CONTRACT

RFP No. 20-359

1. A contract was awarded, March 3, 2021 for the **Metro Vancouver Regional District.**

   To: ***Dell Technologies Inc.***

   in the anticipated amount of up to **$3,598,425** (exclusive of taxes) for the Supply of Desktop & Laptop Computers and Servers over a five (5) year period.

   The contract price is within the overall budget.

2. Proponents were invited by Metro Vancouver's and BC Bid websites and private invitation on November 5, 2020.

   Closing Date: December 4, 2020.

3. Proposals received (exclusive of taxes):

Dell Technologies Inc.	$3,598,425
TLD Computers Inc.	$3,839,395

4. Proposals reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Corporate Services Department Staff

5. Award was made to the highest ranked proponent and lowest cost based on the evaluation criteria established in the RFP.

Appendix A
No. 3

AWARD OF CONTRACT

TENDER No. 21-053

1. A contract was awarded, March 18, 2021 for the **Greater Vancouver Water District.**

   To: ***Jacob Bros. Construction Inc.***

   in the amount of **$755,957** (exclusive of taxes) for construction services for the Little Mountain Reservoir Roof Upgrade.

   The contract price is within the overall budget.

2. Four (4) firms were shortlisted as a result of RFQ No. 20-341 (publicly advertised on Metro Vancouver's and BC Bid websites) and invited to bid on ITT No. 21-053 on March 2, 2021.

   Closing Date: March 26, 2021

3. Tenders received (exclusive of taxes):

Jacob Bros. Construction Inc.	$755,957
Bennett Mechanical Installations (2001) Ltd.	$987,000
PCL Constructors Westcoast Inc.	$1,077,819

4. Tenders reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Water Services Department Staff

5. Award was made to the lowest compliant bidder.

Appendix A
No. 4

AWARD OF CONTRACT

RFP No. 20-381

1. A contract was awarded, March 25, 2021 for the **Greater Vancouver Water District.**

   To: ***Talon Helicopters Ltd.***

   in the anticipated amount of up to **$1,335,100** (exclusive of taxes) for Helicopter Services for up to a five (5) year duration. The initial award is for a three (3) year period at a cost of $801,060 with an option to extend for an additional two (2) year period, subject to mutual agreement.

   The contract price is within the overall budget.

2. Proponents were invited by Metro Vancouver's and BC Bid websites and private invitation on December 7, 2020.

   Closing Date: January 15, 2021

3. Proposals received (exclusive of taxes):

Sierra Helicopters Ltd.	$1,251,820
Contour Helicopters Ltd.	$1,296,220
Talon Helicopters Ltd.	$1,335,100

4. Proposals reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Water Services and Regional Parks Department Staff

5. Talon's proposal clearly detailed their experience, qualifications, personnel experience/competencies, and equipment suitability. Talon also has a very strong and proven track record of working with the Corporation for the past 23 years in supplying helicopter services.

Appendix A
No. 5

AWARD OF CONTRACT

RFP No. 20-308

1. Master Agreements were awarded, April 9, 2021 for the **Greater Vancouver Sewerage and Drainage District.**

   To: ***Colliers Project Leaders Inc., Parsons Inc.,***
   RAM Engineering Ltd., R.F. Binnie & Associates Ltd.

   in the anticipated amount of up to **$4,000,000** (exclusive of taxes) for Liquid Waste Services Design and Construction Projects – Project Management Services over a five (5) year period.

   Awarded to all four (4) consulting engineering firms who submitted to perform professional consulting project management services required to undertake Liquid Waste Services projects during design and construction phases. Projects of less than $250,000 will be made rotationally and negotiated. Values exceeding $250K up to $500K may attract competition from up to the four (4) selected.

2. Four (4) firms were shortlisted as a result of RFQ No. 20-176 (publicly advertised on Metro Vancouver's and BC Bid websites) and invited to bid on RFP No. 20-308 on December 9, 2020.

   Closing Date: January 12, 2021

3. Proposals received (exclusive of taxes):

RAM Engineering Ltd.	$439,000
Colliers Project Leaders Inc.	$453,000
Parsons Inc.	$539,500
R.F. Binnie & Associates Ltd.	$540,100

4. Proposals reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Liquid Waste Services Department Staff

5. Awards were made to all four (4) Proponents as all four submitted high quality proposals based on the evaluation criteria established in the RFP. The fees noted in section 3 were provided based on a sample project with predetermined hours for various staff roles.

Appendix A
No. 6

AWARD OF CONTRACT

TENDER No. 21-020

1. A contract was awarded, April 22, 2021 for the **Greater Vancouver Sewerage and Drainage District.**

   To: ***Ward and Burke Microtunnelling Ltd.***

   in the amount of **$4,885,113** (exclusive of taxes) for Construction Services – Microtunnelling of the Albert St. Sanitary Trunk Sewer Phase 2 – Barnet Hwy Section.

   The contract price is within the overall budget.

2. Three (3) firms were shortlisted as a result of RFQ No. 20-288 (publicly advertised on Metro Vancouver's and BC Bid websites) and invited to bid on ITT No. 21-020 on January 8, 2021.

   Closing Date: February 9, 2021

3. Tenders received (exclusive of taxes):

Ward and Burke Microtunnelling Ltd.	$4,885,113
Michels Canada Co.	$7,225,756
Pomerleau, Inc.	$8,327,626

4. Tenders reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Liquid Waste Services Department Staff

5. Award was made to the lowest compliant bidder.

Appendix A
No. 7

AWARD OF CONTRACT

TENDER No. 21-028

1. A contract was awarded, April 29, 2021 for the **Metro Vancouver Housing Corporation.**

   To: ***New City Contracting Ltd.***

   in the amount of **$3,651,954** (exclusive of taxes) for Building Envelope Rehabilitation – Kelly Court.

   The contract price is within the overall budget.

2. Tenderers were invited by Metro Vancouver's and BC Bid websites and private invitation on February 22, 2021.

   Closing Date: April 9, 2021

3. Tenders received (exclusive of taxes):

New City Contracting Ltd.	$3,651,954
Pacific Building Envelope Maintenance Ltd.	$3,768,000
Centra Construction	$3,778,549
Boston Construction Corp.	$3,821,058
All Round Home Improvements & Restorations Ltd.	$3,918,904
Golden Globe Construction Ltd.	$4,299,000
Sunrise Projects Ltd.	$4,620,500
Restruction Building Services Ltd.	$5,450,000

4. Tenders reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Regional Planning & Housing Services Department Staff

5. Award was made to the lowest compliant bidder.

Appendix A
No. 8

AWARD OF CONTRACT

TENDER No. 21-030

1. A contract was awarded, May 12, 2021 for the **Greater Vancouver Sewerage and Drainage District.**

   To: ***United Rental of Canada Inc.***

   in an anticipated amount not to exceed **$1,289,149** (exclusive of taxes) for Supply, Installation, Commissioning and Maintenance of Two Rental Gensets. Genset #1 has a maximum rental period of 7 years and Genset #2 has a maximum rental period of 9 months. The initial award, at a cost of $609,515, represents a rental period of 3 years and 6 months, respectively.

   The contract price is within the overall budget.

2. Tenderers were invited by Metro Vancouver's and BC Bid websites and private invitation on February 23, 2021.

   Closing Date: March 17, 2021

3. Tenders received (exclusive of taxes):

United Rental of Canada Inc.	$1,289,149
Trinity Power Corporation	$1,386,660
Finning Canada	$1,460,825

4. Tenders reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Liquid Waste Services Department Staff

5. Award was made to the lowest compliant bidder.

Appendix A
No. 9

AWARD OF CONTRACT

TENDER No. 21-076

1. A contract was awarded, May 20, 2021 for the **Greater Vancouver Water District.**

   To: ***Vancouver Pile Driving Ltd.***

   in the amount of **$1,660,950** (exclusive of taxes) for Construction Services for Seymour Middle-Lake Debris Boom.

   The contract price is within the overall budget.

2. Five (5) firms were shortlisted as a result of RFQ No. 20-067 (publicly advertised on Metro Vancouver's and BC Bid websites) and invited to bid on ITT No. 21-076 on March 29, 2021.

   Closing Date: April 29, 2021

3. Tenders received (exclusive of taxes):

Vancouver Pile Driving Ltd.	$1,660,950
JJM Construction Ltd.	$1,901,500
Rivertec Inland Spill Response Corp.	$1,988,821

4. Tenders reviewed by:

   Contractual: Purchasing and Risk Management Division Staff

   Technical: Water Services Department Staff

5. Award was made to the lowest compliant bidder.

Appendix C
No. 1

AMENDMENT TO A PREVIOUSLY REPORTED CONTRACT

RFP No. 18-048
PURCHASE ORDER No. 613456

Construction – Second Narrows Water Supply Tunnel Burrard Inlet Crossing
for the **Greater Vancouver Water District**

1.	Name of Contractor:	Traylor-Aecon General Partnership
2.	Date Contract Reported:	**January 2019**
3.	Original Anticipated Reported Value of Contract (exclusive of taxes):	$266,559,432
4.	Amendment Number:	01
5.	Value of Amendment (exclusive of taxes):	$27,171,143
6.	Amendment Type:	Additional Services
7.	Total Revised Anticipated Amended Value of Contract (exclusive of taxes):	$293,730,575

8. Budget Status:

   This contract is funded within the capital budget for this program.

9. Amendment No. 1 is the result of Change Order No. 1 (CO #1) in the amount of $19,899,602 and the remaining Change Orders 2 through 37 with a combined amount of $7,271,541. CO #1 was previously approved by the Board post award of the main contract. This scope of work was removed from the initial award while further discussions with the City of Burnaby were concluded regarding the South Valve Chamber's design and location. The remaining change orders are a combination of revisions to scope, differing site conditions, and claims settlement.

Appendix C
No. 2

AMENDMENT TO A PREVIOUSLY REPORTED CONTRACT

RFP No. 19-371
PURCHASE ORDER No. 652480

Supply and Delivery of Steel Pipe for 2020 Water Services Construction Projects
for the **Greater Vancouver Water District**

1.	Name of Contractor:	Northwest Pipe Company
2.	Date Contract Reported:	**May 2020**
3.	Original Anticipated Reported Value of Contract (exclusive of taxes):	$17,531,398
4.	Amendment Number:	01
5.	Value of Amendment (exclusive of taxes):	$2,180,288
6.	Amendment Type:	Additional Services
7.	Total Revised Anticipated Amended Value of Contract (exclusive of taxes):	$19,711,686

8. Budget Status:

   This contract is funded within the capital budget for this program.

9. Amendment No. 01 is the result of award of the Provisional Item – Fleetwood Reservoir Feeder Main Pipe at a cost of $1,453.136. Change Orders 1 and 2 were for the supply and delivery of test heads for each project.

Appendix C
No. 3

AMENDMENT TO A PREVIOUSLY REPORTED CONTRACT

Sole Source No. 18-163
PURCHASE ORDER No. 604471

Archaeological Monitoring for Geotechnical Exploration for the Northwest Langley Wastewater Treatment Plant Projects
for the **Greater Vancouver Sewerage and Drainage District**

1.	Name of Contractor:	Katzie Development Limited Partnership
2.	Date Contract Reported:	**April 2021**
3.	Original Awarded Value of Contract:	$466,289
	Value of previous Amendment No. 1:	$979,517
	Subtotal:	**$1,445,806**
4.	Amendment Number:	02
5.	Value of Amendment (exclusive of taxes):	$576,782
6.	Amendment Type:	Additional Services
7.	Total Revised Anticipated Amended Value of Contract (exclusive of taxes):	$2,022,588

8. Previous Amendment Explanation (Reported to Performance and Audit Committee April 2021)

   Amendment No. 01 is for archaeological inspection services and assessment of deposits found when monitoring of the phase 2 ground improvement subgrade at Northwest Langley. Several archaeological sites have been identified for inspection.

9. Budget Status:

   This contract is funded within the capital budget for this program.

10. Amendment No. 02 is the result of the second phase of archaeological inspection services and sifting of archaeological deposits recovered from the site identified through monitoring of the phase 2 ground improvement subgrade at Northwest Langley.

Appendix C
No. 4

AMENDMENT TO A PREVIOUSLY REPORTED CONTRACT

RFP No. 17-030
PURCHASE ORDER No. 144308

Consulting Engineering Services for the Design and Construction Administration of the Coquitlam Transfer Station for the **Greater Vancouver Sewerage & Drainage District**

1.	Name of Contractor:	Morrison Hershfield Ltd.
2.	Date Contract Reported:	**July 2017**
3.	Original Awarded Value of Contract (Phases A & B):	$1,513,122
	Value of previous Amendment No. 1 (Phases C & D):	$3,550,687
	Value of Board Approved Contract (Phase C part 2):	$3,327,805
	Subtotal:	**$8,391,614**
4.	Amendment Number:	02
5.	Value of Amendment (exclusive of taxes):	$553,886
6.	Amendment Type:	Additional Services
7.	Total Revised Anticipated Amended Value of Contract (exclusive of taxes):	$8,945,500

8. Previous Amendment Explanation (Reported to Performance and Audit Committee April 2018 and Board Approved January 2019)

   Amendment No. 01 is the result of awarding Phase C - Detailed Design and Phase D - Construction Administration and Post Construction Services. Board Approved – Phase D Part 2 - Construction Administration.

9. Budget Status:

   This contract is funded within the capital budget for this program.

10. Amendment No. 02 is the result of changes that fall into four categories, as described below:

    - Additional Design and Construction Administration for Off-site Works
      The building permit was obtained following execution of the construction contract. As part of the permitting process, the City required subdivision of the landfill site to create

three distinct properties. As a result, it was necessary to make the three properties independent by separating their civil services and to complete improvements of the United Boulevard frontage.

- Materials Management
  Due to geotechnical or environmental characteristics of sub-surface materials encountered on the landfill site, it has been necessary to modify excavation and fill plans in several instances. This has been particularly challenging, as it is necessary to retain all materials on site and incorporate into the finished project. Handling of materials and modifications to design have resulted in additional costs.

- Design Modifications
  Over the course of construction, several updates to the design were required, as is typical of any construction project. These updates are based on new or changed functional requirements from MV or discovery of inconsistent design elements.

- Construction Period Extension
  The construction period has been extended because of delays as well as additional construction efforts related to the changes noted above. As a result, engineering costs related to full time efforts have increased proportionally.

Appendix C
No. 5

AMENDMENT TO A PREVIOUSLY REPORTED CONTRACT

ITT No. 16-034
PURCHASE ORDER No. 141604

Sapperton Pump Station Replacement Project
for the **Greater Vancouver Sewerage and Drainage District**

1.	Name of Contractor:	NAC Constructors Ltd.
2.	Date Contract Reported:	**February 2017**
3.	Original Anticipated Reported Value of Contract (exclusive of taxes):	$38,566,000
4.	Amendment Number:	02
5.	Value of Amendment (exclusive of taxes):	$4,270,932
6.	Amendment Type:	Additional Services
7.	Total Revised Anticipated Amended Value of Contract (exclusive of taxes):	$47,059,449 (includes value of previously reported Amendment No. 1 - $4,222,517)

8. Previous Amendment Explanation (Reported to Performance and Audit Committee October 10, 2019)

   Amendment No. 01 was the result of design modifications required to complete design work that was more indicative of the scope at the time of the Construction Tender, and for unforeseen site conditions including contaminated soils removal and remediation. The indicative design work includes the 69kV Gas Insulated Switchgear and the riparian landscaping details. Waiting for the information to complete the design would have delayed the tender by one year resulting in increased consulting engineering costs and inflation on the construction costs. The Sapperton Pump Station Replacement Project is currently under construction, approximately 76% complete. The total project value of $82M for design and construction is projected to be under budget by $10M due to the project decisions implemented.

9. Budget Status:

   This contract is funded within the capital budget for this program.

10. Amendment No. 02 is the result of change orders 43 to 152 required for the following items: various design improvements from the design consultant or at the request of the GVS&DD, additional contaminated soil removal costs, additional 69kV Gas Insulated Switchgear assembly and installation costs, provision of spare parts, provision of additional standby generation capacity after commissioning as required by GVS&DD, and resolution of Contractor Claims. The Sapperton Pump Station Replacement Project has currently achieved substantial completion and less than 1% of work remains to be completed. The total project value of $82M for design and construction is now projected to be under budget by $5M due to the project decisions implemented.

Appendix C
No. 6

AMENDMENT TO A PREVIOUSLY REPORTED CONTRACT

RFP No. 11-113
PURCHASE ORDER No. 622477

Annacis Island Wastewater Treatment Plant (AIWWTP) Stage 5 Expansion - Engineering Services
for the **Greater Vancouver Sewerage and Drainage District**

1.	Name of Contractor:	Brown and Caldwell Consultants Canada Ltd.
2.	Date Contract Reported:	**September 2012**
3.	Original Anticipated Reported Value of Contract (exclusive of taxes):	$62,928,926
4.	Amendment Number:	01
5.	Value of Amendment (exclusive of taxes):	$9,296,456
6.	Amendment Type:	Additional Services
7.	Total Revised Anticipated Amended Value of Contract (exclusive of taxes):	$72,225,382

8. Budget Status:

   This contract is funded within the capital budget for this program.

9. Amendment No. 01 covers multiple individual change orders over the 10 years of this contract. The most significant items include consumer price index (CPI) adjustments as per the contract, provision of project specific insurance, additional design effort to address previously unknown issues, additional construction engineering services to accommodate longer schedules, and enhanced support to respond to contractor claims.

Appendix D

June 24, 2021

Competitive Selection Packages Anticipated to be greater than $500,000
(Issued but not awarded)

Note: All contracts listed below are within the project budgets approved by the Board of Directors

Tender/RFP	Closing Date
RFP No. 19-284 *Supply and Delivery of a Trickling Filter Spare Pump*	March 10, 2020
RFP No. 20-042 *Design and Supply of South Surrey Interceptor - Delta Air Management Facility*	June 11, 2020
RFP No. 20-165 *Pre-Selection of Grit Management Equipment for the Northwest Langley Wastewater Treatment Plant Upgrade* **(Awarded less than $500K)**	October 27, 2020
RFP No. 20-075 *Pre-Selection of Liquid Train Odour Control Equipment for the Northwest Langley Wastewater Treatment Plant Upgrade* **(Awarded less than $500K)**	December 16, 2020
RFP No. 20-241 *Construction Upgrade - Coquitlam Landfill West Leachate Pump Station* **(Awarded less than $500K)**	January 22, 2021
RFP No. 20-235 *Solid Waste Weigh Scale Software Replacement*	January 14, 2021
RFP No. 20-358 *Engineering Services for Annacis Island Wastewater Treatment Plant Stage 5 Expansion Trickling Filter Pump Station and Trickling Filters*	February 26, 2021
RFP No. 20-350 *Construction Services for the Crescent Beach Force Main Stage 3 – Phase 1 - Mud Bay to North of Colebrook Road*	February 12, 2021
RFP No. 21-032 *Supply and Delivery of a Sewer Cleaning Truck*	March 31, 2021

RFP No. 20-002 *Annacis Island WWTP Stage 5 Expansion – Phase 2, A506 Contract – Gravity Thickener Expansion*	March 25, 2021
RFP No. 20-357 *Annacis Main No. 5 South - 96th Avenue Pre-Build*	March 15, 2021
RFP No. 20-054 *Construction of Douglas Road Main No. 2 Still Creek Section – Microtunnel*	April 30, 2021
RFP No. 20-103 *Construction Services for Golden Ears Forcemain and River Crossing*	April 21, 2021
RFP No. 21-101 *Consulting Engineering Services for Port Coquitlam Pump Station Upgrades*	April 21, 2021
RFP No. 21-125 *Employee and Family Assistance Program – Metro Vancouver*	April 21, 2021
RFP No. 21-019 *AIWWTP Trickling Filters No. 2 and 4 - Tricking Filter Media, Rotary Distributor and Ducting Replacement*	April 15, 2021
RFP No. 21-062 *Supply and Delivery of Fire Truck and Pumper*	April 7, 2021
RFP No. 20-376 *Surveying Services for High-Precision Deformation Monitoring and Vibration Monitoring*	April 7, 2021
RFP No. 21-164 *Architect and Design Services for Affordable Housing Project – Southwynde*	May 27, 2021
RFP No. 21-127 *Consulting Engineering Services for the Implementation of Building Information Modelling Applications*	May 26, 2021
Tender No. 21-046 *Construction –Installation of Fleetwood Reservoir Feeder Main*	May 26, 2021
RFP No. 21-166 *Consulting Engineering Services for the Capilano Energy Recovery Facility Break Head Tank Bypass Improvements Project*	May 20, 2021

RFP No. 21-163 May 20, 2021
Architect and Design Services for Affordable Housing Project – Eastburn Square

RFP No. 21-027 May 14, 2021
Bottom Ash Beneficial use

RFP No. 21-117 May 13, 2021
Architect and Design Services for Affordable Housing Project – Pitt Meadows (Civic Centre Site)

RFP No. 21-045 May 6, 2021
Design Build Services - Pacific Spirit Regional Park Service Yard Replacement

RFP No. 20-354 June 24, 2021
Construction - Annacis Water Supply Tunnel

RFP No. 20-345 July 29, 2021
Construction Services for the Burnaby Lake North Interceptor No. 2 – Winston Street Phase 2 Trenchless Section

RFP No. 21-073 July 13, 2021
Supply, Installation and Commissioning of Two Polymer Injection Systems

RFP No. 21-192 July 13, 2021
Design, Supply and Installation of an Active and a Passive Air Management Facilities For the North Surrey Interceptor Including Site Works

Tender No. 21-058 July 8, 2021
Demolition of Heather Place Phase 2

To: Indigenous Relations Committee

From: Marino Piombini, Program Manager, Indigenous Relations, Legal Services and Indigenous Relations

Date: June 25, 2021 Meeting Date: July 8, 2021

Subject: **Quarterly Report on Reconciliation Activities**

RECOMMENDATION
That the Indigenous Relations Committee receive for information the report dated June 25, 2021, titled "Quarterly Report on Reconciliation Activities."

EXECUTIVE SUMMARY
This report provides a summary of reconciliation events and activities undertaken by Metro Vancouver over the past several months as well as information on upcoming events and activities over the next few months.

PURPOSE
To provide the committee with a quarterly report and update on reconciliation activities.

BACKGROUND
This quarterly report on regional and local reconciliation activities and opportunities is part of the Indigenous Relations Committee's annual work plan. This information report is intended to identify opportunities for Committee and MVRD Board members to learn about, and engage in, reconciliation activities in the region, and includes:

- Reconciliation events and activities that have been undertaken by Metro Vancouver over the past four months (Attachment 1), and

- Upcoming opportunities over the next few months for engaging in such activities (Attachment 2).

The charts in Attachment 1 and Attachment 2 are based on the four objectives established by the Metro Vancouver Board in October 2015 in its review of the Truth and Reconciliation Commission's (TRC) *Calls to Action*:

- Liaising with the TRC and Reconciliation Canada
- Raising Awareness of Indian Residential Schools
- Providing Cultural Competency Training, and
- Strengthening Relationships with First Nations.

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

FINANCIAL IMPLICATIONS

The various Metro Vancouver activities identified in 2021 have been included in the Indigenous Relations budget. There are no additional financial implications with respect to the items identified in this information report.

CONCLUSION

This report provides a quarterly update on reconciliation activities involving Metro Vancouver and local governments as per the Committee's recommendations and for members' information.

Attachments

1. Reconciliation Activities Undertaken: April 2021 to June 2021
2. Some Upcoming Reconciliation Activities: July 2021 to September 2021

ATTACHMENT 1

Reconciliation Activities Undertaken:
April 2021 to June 2021

Objectives	Activity / Date	Notes
Raising Awareness	Meeting of the Community of Practice on Indigenous Relations April 12, 2021 on Microsoft Teams	Metro Vancouver staff took part in a meeting of the Community of Practice on Indigenous Relations to discuss the group's membership and draft terms of reference as well as opportunities to collaborate on emerging topics, such as land acknowledgements, capacity funding, and cumulative effects. This meeting was hosted by Translink staff.
Strengthening Relationships with First Nations	Metro Vancouver-Seyem meeting April 13, 2021 on Zoom	Metro Vancouver staff from Indigenous Relations and Regional Economic Prosperity Partnership met with the CEO of Seyem (Kwantlen First Nation's business arm) to discuss possible future business development opportunities for Kwantlen and other First Nation communities and urban Indigenous peoples.
Strengthening Relationships with First Nations	Metro Vancouver-St'át'imc Nation staff to staff meeting April 13, 2021 on Zoom	Metro Vancouver staff from Indigenous Relations and Air Quality had a meeting with St'át'imc Nation to discuss the environmental impacts of the Non-Road Diesel Engine Emission Regulation potential expansion.
Strengthening Relationships with First Nations	Meeting with Indigenous artist for interpretive elements on Metro Vancouver project April 20, 2021 on Zoom	Metro Vancouver staff from Indigenous Relations, Community Engagement, and Water Services had a meeting with an artist from Kwantlen First Nation to discuss interpretive elements for an upcoming Metro Vancouver project.
Strengthening Relationships with First Nations	Metro Vancouver-Katzie First Nation-Province of BC staff meeting April 30, 2021 on Zoom	Metro Vancouver, Katzie First Nation, and Provincial staff had a meeting to discuss the operation of the Pitt-Addington Wildlife Management Area.

Objectives	Activity / Date	Notes
Providing Cultural Competency Training	Training Course for Metro Vancouver staff: "Chance Find Management Procedure" May 4, 2021 on Zoom	Indigenous Relations staff facilitated a 45-minute training session on Metro Vancouver's Chance Find Management Procedure for archaeological resources to 17 staff from Liquid Waste Services. The training covers the rationale for chance find management and how to use the procedure for projects.
Strengthening Relationships with First Nations	Metro Vancouver-Katzie First Nation staff to staff meeting May 6, 2021 on Zoom	Metro Vancouver and Katzie First Nation staff had a meeting to discuss ongoing projects at the Northwest Langley Wastewater Treatment Plant Upgrade.
Strengthening Relationships with First Nations	Metro Vancouver-Musqueam Indian Band-First Nations Fisheries Council of BC staff meeting May 7, 2021 on Zoom	Metro Vancouver, Musqueam Indian Band, and the First Nations Fisheries Council of BC had a meeting to discuss the ecological management of the Fraser River, Burrard Inlet, and Boundary Bay Estuaries.
Providing Cultural Competency Training	Training Session on "Cumulative Effects" May 11 and 14, 2021 on Zoom	Indigenous Relations staff was involved in the planning of, and took part in, a two-part Cumulative Effects workshop for Metro Vancouver technical staff to learn more about how changes to environmental, social and economic values caused by the combined effects of past, present and potential future human activities and natural processes can be applied to Metro Vancouver's future work and projects involving Indigenous Nations.
Providing Cultural Competency Training	Training Course for Metro Vancouver staff: "Chance Find Management Procedure" May 12, 2021 on Zoom	Indigenous Relations staff facilitated a 45-minute training session on Metro Vancouver's Chance Find Management Procedure for archaeological resources to 8 staff from Solid Waste Services.
Providing Cultural Competency Training	Training Course for Metro Vancouver staff: "Chance Find Management Procedure" May 12, 2021 on Zoom	Indigenous Relations staff facilitated a 45-minute training session on Metro Vancouver's Chance Find Management Procedure for archaeological resources to 8 staff from the Housing Maintenance and Capital Projects Division of the Regional Planning and Housing Services Department.

Objectives	Activity / Date	Notes
Providing Cultural Competency Training	Training Course for Metro Vancouver staff: "Canada's History through an Indigenous Lens" facilitated by Raven Institute May 18, 2021 on Zoom	Metro Vancouver staff received a training session from Raven Institute. This training session examines impacts and legacy of Indian residential schools in Canada.
Strengthening Relationships with First Nations	Metro Vancouver-Semiahmoo First Nation meeting May 19, 2021 on Zoom	Metro Vancouver and Semiahmoo First Nation had a meeting to discuss the ecological management of the Boundary Bay Estuary.
Strengthening Relationships with First Nations	Metro Vancouver-Kwikwetlem First Nation Quarterly Project Review Meeting May 26, 2021 on Zoom	Metro Vancouver and Kwikwetlem First Nation staff had a meeting to provide information and answer questions about upcoming Metro Vancouver projects in Kwikwetlem territory.
Providing Cultural Competency Training	Training Session on "Indigenous Relations and First Nations" May 28, 2021 on Zoom	Indigenous Relations staff facilitated a three-hour training session on building relations with First Nations for approximately 30 staff members in Metro Vancouver's Regional Parks division in the Parks and Environment department. The session covers milestones in Canadian history, policies and legislation, treaty negotiations, local First Nations, Metro Vancouver's policies and working effectively with Indigenous peoples.
Providing Cultural Competency Training	Workshop on Reconciliation for the Regional Administrators Advisory Committee (RAAC) June 3, 2021 on Zoom	Metro Vancouver's CAO and Indigenous Relations staff hosted a special three-hour workshop on the topic of reconciliation to city managers in the region. The workshop featured presentations from Indigenous Relations staff, an external legal advisor, senior staff from the Capital Regional District in Victoria, and consultants for Metro Vancouver.
Strengthening Relationships with First Nations	Metro Vancouver-Kwikwetlem First Nation Meeting on Metro Vancouver's Regional Parks Plan June 8, 2021 on Zoom	Metro Vancouver hosted a meeting for Kwikwetlem First Nation to provide information and answer questions about Metro Vancouver's Regional Parks Plan and to discuss the First Nation's interest and involvement in the planning process.

Objectives	Activity / Date	Notes
Providing Cultural Competency Training	Training Session on "Indigenous Relations and First Nations" June 11, 2021 on Zoom	Indigenous Relations staff facilitated a three-hour training session on building relations with Indigenous Nations to 25 Metro Vancouver staff members.
Strengthening Relationships with First Nations	Metro Vancouver-Kwikwetlem First Nation Leadership Meeting June 14, 2021 on Zoom	Metro Vancouver's CAO, senior managers and staff had a meeting with Kwikwetlem First Nation elected officials and staff to discuss issues of mutual interest, including the Coquitlam Watershed.
Raising Awareness	National Indigenous Peoples Day event for Metro Vancouver staff June 21, 2021 on Zoom	Indigenous Relations coordinated a lunch and learn session for Metro Vancouver staff with guest presenter Chief Harley Chappell and Councillor Joanne Charles of Semiahmoo First Nation for a "Semiahmoo 101" session and to screen a recently completed video on Semiahmoo First Nation by Metro Vancouver's Multi-Media Division within the External Relations Department. There were 225 participants on the Zoom call.
Raising Awareness	Municipal Technical Advisory Committee (MTAC) on Indigenous Relations June 23, 2021 on Zoom	As part of a regular meeting of the Municipal Technical Advisory Committee (MTAC) on Indigenous Relations, Metro Vancouver hosted a special one-hour workshop on "Territorial Acknowledgements" for municipal and regional district staff facilitated by Michelle Nahanee, a Squamish Nation member and founder of Nahanee Creative. There were over 50 participants on the Zoom call.

ATTACHMENT 2

Some Upcoming Reconciliation Activities:
July 2021 to September 2021

Objectives	Activity / Date	Notes
Strengthening Relationships with First Nations	Metro Vancouver-Kwikwetlem First Nation Quarterly Project Review Meeting July 6, 2021 on Zoom	Metro Vancouver will host a meeting for Kwikwetlem First Nation staff for the purposes of providing information and answering questions about upcoming Metro Vancouver projects within Kwikwetlem's territory.
Raising Awareness	Municipal Technical Advisory Committee (MTAC) on Indigenous Relations September 22, 2021 on Zoom	As part of a regular MTAC meeting, Metro Vancouver staff have invited provincial staff to discuss the implementation of the *Declaration on the Rights of Indigenous Peoples Act* (DRIPA).
Raising Awareness	Orange Shirt Day event for Metro Vancouver staff September 2021 on Zoom	On a day close to the end of September 2021, Indigenous Relations will coordinate an event for Metro Vancouver staff, such as a lunch and learn session, on a topic related to Orange Shirt Day and reconciliation with Indigenous peoples.

To: Regional Parks Committee

From: Mike Redpath, Director, Regional Parks
Jeffrey Fitzpatrick, Division Manager, Regional Parks Design and Development

Date: June 21, 2021 Meeting Date: July 14, 2021

Subject: **Draft Regional Parks 2022 – 2026 Capital Plan**

RECOMMENDATION

That the Regional Parks Committee receive for information the report dated, June 21, 2021, titled "Draft Regional Parks 2022 – 2026 Capital Plan".

EXECUTIVE SUMMARY

The Draft 2022 – 2026 Regional Parks Capital Plan has been prepared following direction received at the April 8, 2021 Metro Vancouver Board Budget Workshop. As part of Metro Vancouver's focus on enhancing transparency and governance, the Capital Plan is being provided to the Regional Parks Committee for feedback in advance of final budget preparation and presentation to the Committee and Board in the fall.

The estimated 2022 Capital Cash Flow is $31.6M with a total estimated spend of $163.3M over the five years. This is a $28M, or 26.7% change from last year's five-year capital plan. This change is due to accelerated greenway initiatives following MVRD Board approval of *Regional Greenways 2050*, increased investment in park carrying capacity and visitor experience, and advanced planning and cost estimates on major projects.

PURPOSE

To present the Draft Regional Parks 2022 – 2026 Capital Plan to the Committee for input which will be incorporated into the final Regional Parks 2022 – 2026 Capital Plan.

BACKGROUND

On April 8, 2021, Metro Vancouver held a Board Budget Workshop to seek direction for the preparation of the 2022 - 2026 Financial Plan. Metro Vancouver is enhancing the transparency and governance of the capital planning process by providing Metro Vancouver Committees with an opportunity for input in advance of final budget preparation and presentations to the Committee and Board in the fall.

Regional Parks Capital Plan

The Regional Parks Capital Plan reflects the *Board Strategic Plan 2019-2022*, *Regional Parks Plan*, *Regional Greenways 2050*, regional park management plans and ongoing natural and built asset management strategic planning.

Before 2020, visitation to regional parks grew at roughly 4% year, or roughly twice the rate of regional population growth. In 2020, regional parks saw 16.5 million visits – an increase of 38% from 2019,

when there were 11.9 million visits. High levels of visitation have continued through 2021. The Regional Parks Capital Plan includes investments in enhanced access, carrying capacity and visitor experience, and ecological resilience so regional residents can access the health benefits and ecosystem services from regional parks over the long term.

Specifically, the Regional Parks Capital Plan is guided by the following customer levels of service:

- Expand the Regional Parks System to protect natural areas and connect people to nature
- Develop park amenities to expand capacity and accommodate increased visitation
- Enhance the resilience of the Regional Parks System to climate change and increased visitation
- Maintain park facilities in a state of good repair to ensure safety and reliability over the long term
- Work closely with First Nations to advance reconciliation, build and strengthen relationships
- Expand opportunities to connect with nature to support the mental and physical health of regional residents

CAPITAL PLAN HIGHLIGHTS

The Draft 2022 - 2026 Capital Plan includes two components: major capital and land acquisition. Minor capital, the maintenance and replacement of infrastructure at the end of its lifespan, is included in the operating budget and is not a part of this report.

The Regional Parks capital program is funded by reserves and external grants. The Draft 2022 - 2026 Capital Plan includes $31.6M for 2022 and a total of $163.3M over the five years, an average of $32.7M per year (Attachment 1). In 2022, $16M is allocated to land acquisition and $15.6M is allocated to major capital, of which up to $3.9M will be funded from external grants.

The key drivers for spending over the next 5 years include:

- **Land Acquisition** - Expanding Regional Parks System to protect natural areas and connect people to nature
- **Ecological Resilience** - Enhancing ecological function and resilience to climate change and increased visitation
- **Capacity and Growth** – Developing park amenities to expand capacity and accommodate increased visitation
- **Connected Network** - Expanding the greenway network to improve connectivity
- **Facility Replacement and Asset Management** - Lifecycle replacement of major regional park assets and upgrading, where required, to ensure long term resilience

In 2022, implementation of the MVRD Board approved *Regional Parks Land Acquisition 2050* strategy will continue. The following major capital projects will continue or begin implementation:

- **Widgeon Marsh Regional Park Development** – design, development and opening of Widgeon Marsh Regional Park (*multiyear project*, $7,520,000 in 2022)

- **Grouse Mountain Regional Park Trail and Amenity Improvements** – Investing in Canada Infrastructure Grant funded project *(multiyear project, $600,000 in 2022*)
- **Derby Reach Washroom Building** – Full service washroom building in the Edgewater Bar Day Use Area (multiyear project, $1,560,000 in 2022)
- **Campbell Valley Management Plan Implementation** – Greenway, open space, and ecological enhancements to implement the MVRD Board approved management plan (*multiyear project, $1,500,000 in 2022*)
- **Crippen Regional Park** – The development of trails and amenities for public access to the recently acquired Dorman Point *($500,000 in 2022*), and Phase 1 implementation of the Provincial Infrastructure Grant funded Davies Orchard Revitalization Project (*multiyear project, $850,000 in 2022*)
- **Park Amenities and Visitor Experience –** Enhancements to existing park sites across the Regional Parks System to improve carrying capacity and enhance the park experience (*recurring, $1,000,000 in 2022*)

In 2022 advanced design will begin on the Belcarra South Day Use Area, Delta Nature Reserve and Delta South Surrey Greenway, Belcarra Admiralty Heights Trails, Burnaby Lake Central Valley Greenway Connection, Aldergrove South Slope Greenway, Boundary Bay Perimeter Trail and the Campbell Valley Little River Loop Boardwalk. These projects will advance to implementation from 2023 – 2026.

Capital Plan Changes
The breakdown of total revised 2022 – 2026 Capital Plan compared to prior cycle capital plan is summarized below

Prior Cycle Capital Plan 2021-2025	Cash Flow 2021	Adjustments to 2022-2025 Capital Plan					Cash Flow 2026	Draft Capital Plan 2022-2026
		Carry-Forward	Deferrals/ Accel.	Risk	Scope	Total		
$123.7M	(19M)		20.5M		7.5M	28.0M	30.6M	$163.3M

Adjustments to the 2022-2025 Capital Plan are due to accelerated projects and updated project scopes. Accelerated projects include new greenway initiatives following Board approval of *Regional Greenways 2050* and increased investment in park amenities and visitor experience to support carrying capacity.

The scope of the Widgeon Marsh Regional Park Development and the Campbell Valley Management Plan Implementation projects have been updated to reflect advanced project planning, design and costing.

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

FINANCIAL IMPLICATIONS

The draft 2022 - 2026 Capital Plan includes $31.6M for 2022 and a total of $163.3M over the five years, an average of $32.7M per year. The intent is that the Regional Parks Committee provide feedback which will be incorporated into the final Capital Plan for presentation to the Committee and Board in the fall.

CONCLUSION

The 2022 – 2026 Capital Plan supports expansion of the Regional Parks system to protect natural areas and connect people to nature, development of park amenities to expand capacity and accommodate increased visitation, enhanced resilience to climate change and increased visitation, and the maintenance of facilities in a state of good repair to ensure safety and reliability over the long term.

The presentation of the draft 2022 – 2026 Capital Plan provides the opportunity for input from the Committee which will be incorporated into the fall budget presentation to the Committee and Board.

Attachment *(46542885)*
Draft Regional Parks 2022-2026 Capital Plan

46280433

METRO VANCOUVER REGIONAL DISTRICT
CAPITAL PORTFOLIO
REGIONAL PARKS
DRAFT 2022-2026 CAPITAL PLAN

	ACTUALS ESTIMATED TO DEC 31 2021	2022 CAPITAL CASH FLOW	2023 CAPITAL CASH FLOW	2024 CAPITAL CASH FLOW	2025 CAPITAL CASH FLOW	2026 CAPITAL CASH FLOW	ACTIVE STAGE	PRIMARY DRIVER
CAPITAL EXPENDUTURES								
Major Projects								
Grouse Mountain Regional Park Trail and Amenity Improvements	$ 350,000	600,000	1,114,000	1,114,000			Construction	Capacity, Growth & Ecological Resilience
Widgeon Marsh Regional Park Development	5,000,000	7,520,000	6,580,000				Construction	Capacity, Growth & Ecological Resilience
Campbell Valley Management Plan Implementation	600,000	1,500,000	2,000,000	2,500,000	1,500,000		Construction	Capacity, Growth & Ecological Resilience
Belcarra - South Day Use Area			250,000	2,200,000	3,500,000		Planned	Capacity, Growth & Ecological Resilience
Codd Wetland - Park Development				900,000	4,500,000	4,500,000	Planned	Capacity, Growth & Ecological Resilience
West Creek Wetlands - Park Development			300,000	1,500,000	1,500,000		Planned	Capacity, Growth & Ecological Resilience
Burns Bog - Fire Restoration						500,000	Planned	Capacity, Growth & Ecological Resilience
Total Major Projects Program	**$ 5,950,000**	**$ 9,620,000**	**$ 10,244,000**	**$ 8,214,000**	**$ 11,000,000**	**$ 5,000,000**		
Greenways								
Aldergrove - Rock'n Horse Trail Connector	$	400,000					Planned	Connected Network
DNR/DSSG Management Plan Implementation			600,000	3,500,000	3,500,000	2,500,000	Planned	Connected Network
Boundary Bay - Perimeter Trail			150,000	1,500,000			Planned	Connected Network
Tynehead - Perimeter Trail			1,250,000	1,250,000			Planned	Connected Network
Other Greenways Upgrades			3,500,000	1,000,000	100,000	200,000	Planned	Connected Network
								Connected Network
Total Greenways Program	**$ -**	**$ 400,000**	**$ 5,500,000**	**$ 7,250,000**	**$ 3,600,000**	**$ 2,700,000**		
Service Facilities								
Burnaby Lake - Service Yard Building Replacement	$ 250,000	200,000	50,000	500,000			Construction	Facility Replacement & Asset Management
Total Service Facilities Program	**$ 250,000**	**$ 200,000**	**$ 50,000**	**$ 500,000**	**$ -**	**$ -**		
Park Development								
Crippen - Davies Orchard	$	850,000	750,000				Planned	Capacity, Growth & Ecological Resilience
Derby Reach - Full Service Washroom	490,502	1,560,000					Construction	Capacity, Growth & Ecological Resilience
Crippen - Dorman Point Acces and Amenities		500,000					Planned	Facility Replacement & Asset Management
Colony Farm - TMX Agreement Projects		100,000	300,000	300,000	300,000		Planned	Capacity, Growth & Ecological Resilience
Belcarra - Admiralty Heights Trail Decomissioning			250,000	500,000	250,000		Planned	Capacity, Growth & Ecological Resilience
Belcarra - White Pine Redevelopment & Improvements					150,000	1,600,000	Planned	Capacity, Growth & Ecological Resilience
Campbell Valley - Little River Loop Boardwalk			800,000				Planned	Facility Replacement & Asset Management
Pacific Spirit - Beach Access & Trail Improvments			50,000	100,000	500,000	1,000,000	Planned	Facility Replacement & Asset Management
Advanced Design Work for Future Projects		1,300,000					Planned	Capacity, Growth & Ecological Resilience
Park Amenities and Visitor Experience		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	Planned	Capacity, Growth & Ecological Resilience
Other Replacement, Restoration & Upgrade Projects		100,000	275,000	1,005,000	1,700,000	1,330,000	Planned	Facility Replacement & Asset Management
Total Park Development Program	**$ 490,502**	**$ 5,410,000**	**$ 3,425,000**	**$ 2,905,000**	**$ 3,900,000**	**$ 4,930,000**		
Regional Parks Land Acquisition								
Regional Parks Land Acquisition	$ 12,000,000	16,000,000	16,000,000	15,000,000	13,500,000	18,000,000		Land Acquisition
Total Land Acquisition Program	**$ 12,000,000**	**$ 16,000,000**	**$ 16,000,000**	**$ 15,000,000**	**$ 13,500,000**	**$ 18,000,000**		
TOTAL CAPITAL EXPENDITURES	**$ 18,690,502**	**$ 31,630,000**	**$ 35,219,000**	**$ 33,869,000**	**$ 32,000,000**	**$ 30,630,000**		

SUMMARY BY DRIVER						
Capacity, Growth & Ecological Resilience	$ 6,440,502	$ 14,430,000	$ 12,544,000	$ 10,014,000	$ 12,700,000	$ 7,600,000
Facility Replacement & Asset Management	250,000	800,000	1,175,000	1,605,000	2,200,000	2,330,000
Connected Network	-	400,000	5,500,000	7,250,000	3,600,000	2,700,000
Land Acquisition	12,000,000	16,000,000	16,000,000	15,000,000	13,500,000	18,000,000
Total	**$ 18,690,502**	**$ 31,630,000**	**$ 35,219,000**	**$ 33,869,000**	**$ 32,000,000**	**$ 30,630,000**

To: Climate Action Committee

From: Morgan Braglewicz, Senior Policy and Planning Analyst
Parks and Environment Department

Date: June 24, 2021 Meeting Date: July 16, 2021

Subject: **Modelling a Carbon Neutral Region: Project Report**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated June 24, 2021, titled "Modelling a Carbon Neutral Region: Project Report".

EXECUTIVE SUMMARY

Metro Vancouver has committed to becoming a carbon neutral region by 2050. As a first step towards understanding the potential impact of policies on greenhouse gas emissions reductions, staff undertook a modelling project that compares a business as planned scenario with a carbon neutral scenario. This information was considered by staff as the actions and strategies included in the *Climate 2050 Roadmaps* and *Clean Air Plan* were developed, and were used as an initial estimate of the potential impact of policies in those documents. The results show that while it is possible to achieve significant emissions reductions through the implementation of a set of aggressive but achievable policies, at this time, this scenario did not meet Metro Vancouver's climate targets for 2030 or 2050. The results reaffirm the urgent need for climate action, and the need for a dynamic iterative process in continuing to add new actions as part of the *Climate 2050 Roadmaps*. The modelling was intended to focus on emission reductions, and additional analysis will likely be needed to support additional engagement and detailed implementation of many of these actions.

PURPOSE

This report conveys the final report from the Modelling a Carbon Neutral Region Project.

BACKGROUND

The project 'Modelling a Carbon Neutral Region' was part of the Climate Action Committee's work plan for 2020. In November 2020, the Committee received a verbal update on the interim results from the project. Since that update, the project team has been using the modelling data to inform engagement on the draft *Clean Air Plan* and the *Climate 2050 Roadmaps*. The project is now complete and the consultant has produced a project report summarizing the method, data, assumptions, and results from the modelling work. This report follows up on the presentation of the interim results in November 2020 with the final project report.

PROJECT SUMMARY

This project used a model to evaluate the potential impact of a package of policies on all emissions sectors within the region. The model takes into account vehicle stock, buildings, industrial boilers, and other energy-using equipment, and determines greenhouse gas and air contaminant emissions as well as projected energy demand for 2020, 2030, 2040, and 2050. The model focuses on GHG

emission reductions and does not take into account price, costs, or other economic factors related to the policies, nor other social or behavioural factors. The estimated emissions are compared to Metro Vancouver's climate targets to reduce GHG emissions 45% by 2030, relative to 2010, and to reach regional carbon neutrality by 2050. The project compares a business as planned scenario with a carbon neutral scenario to assess the impact of a package of aggressive and achievable policies.

Scenario Descriptions and Assumptions

The Business as Planned Scenario represents the region's current emissions trajectory, based on policies and actions that currently exist or are very well developed. This includes policy at all orders of government – local, provincial, and federal. The Carbon Neutral Scenario is an aggressive and achievable package of policies and actions designed to drastically reduce emissions across all sectors. As with the business as planned scenario, this includes policies at all orders of government. While most of the policies modelled in the Carbon Neutral Scenario are ambitious, they are rooted in what is technologically feasible, though they may be challenging to implement. Many of the policies are based on similar policies being implemented by leading jurisdictions around the world.

Underpinning both the business as planned and carbon neutral scenarios are a series of assumptions about energy supply and land use that align with the scenario assumptions. Each scenario models a policy package, with the carbon neutral scenario incorporating about 40 policies across all sectors. These policies are detailed in the final project report (Reference 1), developed with the intent of providing transparency on model assumptions.

Results Summary

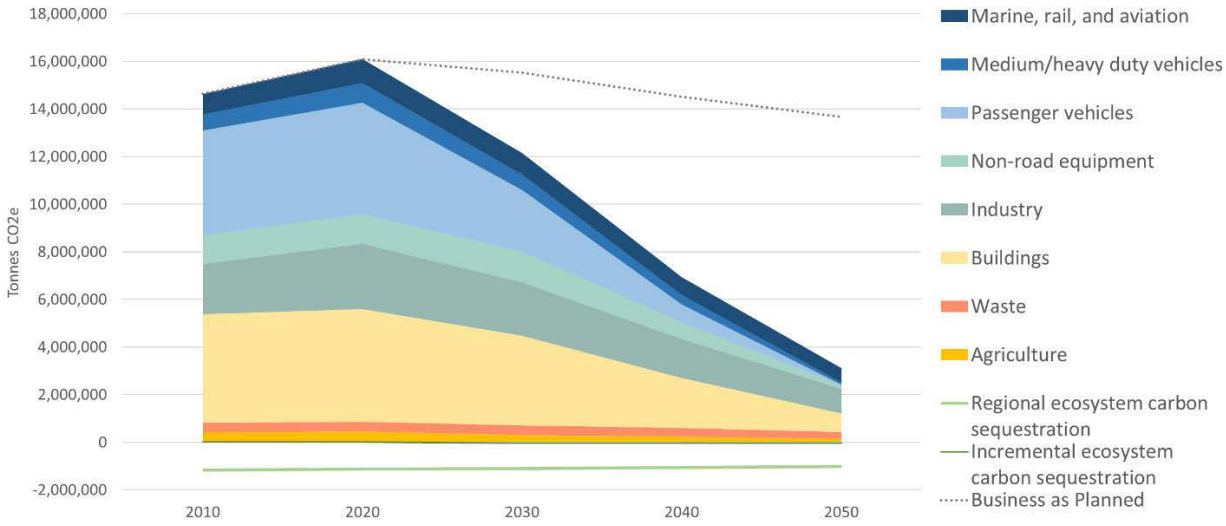
Under the Business as Planned scenario, overall projected GHG emissions decline slightly between 2020 and 2050 (6% reduction relative to 2010). Buildings emissions remain stable as existing regulations for new buildings, such as the BC Step Code, balance out regional population growth. Emissions from light duty vehicles have been declining under the Business as Planned Scenario, and this trend will increase, particularly after 2030, largely due to the *BC Zero-Emissions Vehicle Act* regulations which have already come in to force. However, emissions from other sectors – notably industry, non-road equipment and other transportation sectors (medium/heavy duty vehicles, air, marine, and rail) – increase.

Under the Carbon Neutral Scenario, overall projected GHG emissions for 2030 decrease by over 15% from 2010 and by almost 80% in 2050 (Figure 1). About 3.1 million tonnes of emissions remain in 2050. This is driven by significant switching from fossil fuels to renewable energy sources, notably electricity use in light duty vehicles and buildings. Other renewable energy sources such as renewable natural gas displace emissions in industry and, to a lesser extent, large complex buildings. In this scenario energy efficiency is improved, resulting in less energy demand overall.

Preliminary estimates show that about 1 million tonnes of CO_2 equivalents are sequestered annually in regional ecosystems, but this is projected to decline between 2020 and 2050 due to continued development in the region. While some decreases in regional sequestration over time are offset by policies modelled in the Carbon Neutral Scenario, annual carbon sequestration is not sufficient to balance the remaining GHG emissions in 2050. These results indicate that the scenario modelled would not reach Metro Vancouver's target of a 45% reduction in 2030; while the model did not

produce data points between 2030 and 2040, interpolating the results suggest that a 45% reduction in emissions would be achieved sometime in the mid-2030s. In addition, the results indicate that the current set of policies modelled will not result in the region achieving carbon neutrality by 2050.

Figure 1: Carbon Neutral Scenario Results



It should be emphasized that these are initial modelling results, intended to illustrate the challenge in meeting the targets, prioritize the key actions, and inform a pathway for development of additional actions through an ongoing process of strengthening the *Climate 2050 Roadmaps*.

Key Findings

The results of this project suggest that it is possible to achieve significant emissions reductions if aggressive actions are implemented now, but that additional actions and commitments will be necessary to achieve regional carbon neutrality by 2050 and reduce emissions by 45% by 2030. They also reaffirm the urgency of the situation – the longer policy makers wait, the more difficult it will be to push emissions down closer to the 2030 target. While the region has a strong baseline store of ecosystem carbon that may contribute to carbon neutrality, it is difficult to increase that store, and increasing climate threats may compromise existing natural carbon sequestration. Actions to directly reduce emissions by reducing overall energy use and switching to clean, renewable energy will be the key to reaching carbon neutrality, complemented by robust regional ecosystems that provide numerous benefits in addition to carbon sequestration. And, once emissions have been reduced to the full extent possible, there will be an emergent role for technological carbon capture, utilization, and storage, which also needs to be researched and developed now.

Project Scope and Limitations

This project covered all emissions sectors using a broad range of data sources and model inputs. As a result, this analysis provides an understanding of region-wide greenhouse gas and other air contaminant emissions in business as planned and aggressive climate action futures. The results have helped inform the potential impact of actions under consideration in the *Clean Air Plan* and *Climate 2050 Roadmaps*. However, due to the broad scope of the project, modelling assumptions and

methods were correspondingly broad. As the actions in the *Clean Air Plan* and *Climate 2050 Roadmaps* are implemented, additional work at the individual policy or sector level will likely be needed for key actions to understand detailed policy considerations and impacts, including financial implications. This analysis could also help understand how to implement policies in order to deepen emissions reductions to get closer to regional climate targets for 2030 and 2050.

Additionally, key project outputs are focused on greenhouse gas and air contaminant emissions and reductions, as well as projected energy demand. While the project does take into account other factors such as technology readiness and policy in leading jurisdictions, there are numerous benefits, costs, barriers, and opportunities not fully explored through this project. Follow up work that looks at the costs and benefits associated with an aggressive climate policy scenario will complement the results from this project. Additionally, as actions in the *Clean Air Plan* and *Climate 2050 Roadmaps* are implemented, specific sector or policy level analysis may be needed to explore these factors in more detail. As noted in Report 5.3 in the Climate Action Committee July 2021 agenda package, these are key considerations which have been raised during engagement on the draft *Clean Air Plan*.

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

FINANCIAL IMPLICATIONS
The contract value for this project was initially set at $132,602, but over the course of the project, the contract was amended to reflect changes to the project scope, bringing the final project contract amount to $172,523. Project funding came from the operating budgets for the Air Quality function ($135,023), and Regional Planning function ($20,000). Partner funding was contributed from the City of Vancouver ($10,000), and City of North Vancouver ($7,500). The contract is now complete.

CONCLUSION
The results from this project demonstrate that significant decreases in regional greenhouse gas emissions are possible with the implementation of a suite of aggressive yet achievable policies. However, the results also suggest that in order to reach regional climate targets for 2030 and 2050, additional actions and commitments are needed beyond what was analyzed in this modelling project. Through the *Climate 2050 Roadmaps* and *Clean Air Plan*, staff have identified evidence-informed strategies and actions that work towards meeting regional climate targets. Additional analysis will likely be needed to support the implementation of these actions to fully understand the emissions impact, energy requirements, and costs and benefits. Recognizing that this is the initial set of modelling to support Climate 2050 and the Clean Air Plan, ongoing development of the Climate 2050 Roadmaps will be dynamic and iterative, in order to identify opportunities and implement actions to deepen emissions reductions.

References
Carbon Neutral 2050 - Policy and Modelling Report, consultant's report dated July 2021

46277614

To: Climate Action Committee

From: Lucy Duso, Policy Coordinator, External Relations Department
Laura Taylor, Public Engagement Coordinator, Parks and Environment Department

Date: June 24, 2021 Meeting Date: July 16, 2021

Subject: **Highlights from Engagement on Draft *Clean Air Plan***

RECOMMENDATION

That the Climate Action Committee receive for information the report dated June 24, 2021, titled "Highlights from Engagement on Draft *Clean Air Plan*".

EXECUTIVE SUMMARY

Metro Vancouver's draft *Clean Air Plan* was released for comments April 1 to June 15, 2021. The aim of the engagement program was to seek comments from stakeholders and the public related to the goals, targets, and actions in addition to equity, implementation, and collaboration. The stakeholder engagement activities sought comments on actions related to buildings, industry, transportation, and agriculture from businesses, agencies and others involved in these sectors. For the public, the focus was on outreach to youth and residents who have indicated an interest in climate action and air quality issues with a deliberate effort to expand the audience involved. There was also dialogue with other governments, including First Nations, member jurisdictions, provincial staff and related agencies. Engagement activities attracted about 1,000 public participants and generated over 50 feedback forms and 35 direct emails. This report summarizes some of the prevalent themes from the engagement, and reflects the expected tension between audiences who want to see more action now, and those who feel it is too aggressive. The key issues identified were costs, duplication with other governments initiatives, collaboration, and ability of small businesses to adjust.

PURPOSE

This report provides highlights of the engagement on the draft *Clean Air Plan*, and summarizes the feedback received. Staff are in the process of assessing this feedback to inform revisions to the plan, and expect to present a final version of the *Clean Air Plan* for the Board's consideration in fall 2021.

BACKGROUND

At its March 2021 meeting the Board authorized staff to proceed with engagement on the draft *Clean Air Plan*, based on the report dated February 10, 2021, titled "*Draft Clean Air Plan*". Attachments to that report included a draft *Clean Air Plan* and proposed engagement plan.

Prior to developing the draft *Clean Air Plan* in 2021, a *Clean Air Plan Backgrounder* was released as a resource for early discussion and comments on the plan's direction and scope. Feedback received from this early engagement was provided to the Board in the report dated October 19, 2020, titled, "*Update on Engagement for Clean Air Plan and Related Climate 2050 Roadmap Development*" and considered in developing the draft *Clean Air Plan*. In addition, in conjunction with the *Clean Air Plan*, staff developed and sought comments on draft *Climate 2050 Roadmaps* for buildings and

transportation, and discussion papers on agriculture and industry. Staff will consider feedback and revise all documents in parallel, as there is direct alignment of actions to address both health harming air contaminants as well as greenhouse gas emissions in both the *Clean Air Plan* and these roadmaps.

PUBLIC AND STAKEHOLDER ENGAGEMENT PLAN

The objectives in the engagement plan were three-fold:

- Share information with the public on the purpose and benefits of the *Clean Air Plan*.
- Provide a range of opportunities for the public to provide feedback.
- Have meaningful conversations with specific sectors and organizations (e.g., those impacted by the proposed actions, responsible for implementation, aligned sectors, experience with equity assessment) about their level of support, specific concerns of the impacts or intent, and thoughts on collaboration and implementation.

Sharing information is identified as a key objective in engagement because even as public demands for more climate action grow, the public is largely unaware of the progress on climate action from local governments or what the most effective actions are. Information about the draft plan and engagement was shared through social media promotions with some emphasis on youth-favoured platforms, corporate newsletters, and paid promotions. This outreach was amplified by community partners, including member jurisdictions and other agencies. The intent was to direct the audience to the *Clean Air Plan* site on the Metro Vancouver website. On the website, a concise, plain language summary of the draft *Clean Air Plan* was available along with a two-minute introductory video. During the engagement period there were over 8,000 page visits and 5,000 views of the introductory video.

Public Engagement

Prior to the formal comment period, Metro Vancouver hosted a public climate webinar series from January to March 2021, where the final webinar featured the draft *Clean Air Plan*. That series attracted about 1,000 public participants. The engagement plan promoted a range of opportunities for public feedback that included: two public forums with in-program polling and over 30 minutes in each allocated to public questions; an on-line feedback form; and an email offering the public direct access to the team. To drive the public to the website and on-line feedback form, an invitation for comment was sent to the 4,000+ residents and stakeholder contacts in Metro Vancouver's Air Quality and Climate Change mailing list. The *Clean Air Plan* public forums in April and May attracted about 120 participants, and over 50 feedback forms and over 40 direct emails from were received. Highlights of the reach of this campaign are found in Attachment 1 'Engagement reach infographic for the draft *Clean Air Plan*' and Attachment 2 'Social media to promote the draft *Clean Air Plan'*.

There were two youth-driven leadership discussions featuring the *Clean Air Plan*. Appendix 3 '*Youth engagement on the draft Clean Air Plan'* includes perspective shared from the youth audience.

Stakeholder Engagement

Alongside ensuring opportunity for public feedback, staff pursued meaningful conversations with stakeholders from specific sectors (e.g. industry, transportation, buildings), organizations (e.g. BC Trucking Association, Business Council of BC), and other governments (member jurisdictions, Province, in-region First Nations, health authorities, neighbouring regional districts). Attachments 4 and 5, respectively '*List of audiences connected with in the Clean Air Plan engagement'*, and

'*Stakeholder meetings where Clean Air Plan was a substantial portion of the conversations'* reflect the reach and participation for these conversations. Themes from this feedback are described below. Appendix 6 '*Sample extracts from feedback forms, correspondence, meeting notes'* includes some of the hundreds of comments and recommendations received.

FEEDBACK RECEIVED

Feedback Themes

Feedback was requested against a consistent set of questions through the feedback form and forum agendas. The themes of the questions explored:

- Awareness of Metro Vancouver's commitments and actions related to air quality and climate action in this region;
- Support or concern for any of the targets, goals, strategies or actions in the draft plan;
- Probe for details on why there was support or concerns;
- Any additional considerations or ideas that could be incorporated into the draft plan; and
- In the stakeholder forums, participants were asked to comment on implementation of the plan, potential collaborations, alignment with other initiatives, and equity considerations.

Awareness of Metro Vancouver's commitments and actions varies with audience

Earlier public opinion research, conducted in 2018, to inform the strategy for developing the *Climate 2050 Strategic Framework* indicated that the region's residents have low recognition of local government climate action. However, those motivated to participate in the public forums generally were more aware, ranking about 3.5 on a scale of 1 to 5 for awareness, while awareness was slightly higher in the stakeholder forums. This was why promoting the development of the draft *Clean Air Plan*, including the scope, targets and benefits, was an objective of the engagement plan.

Support or concern for any targets, goals, strategies or actions in the draft plan

The majority of feedback addressed this question. Among targets, goals, strategies or actions, feedback largely addressed specific actions though there were comments on others as noted below.

Targets

The regional targets for GHG emissions reductions, improved air quality and improved visual air quality were generally supported. Some responses recognized the challenge in meeting the GHG targets while others urged Metro Vancouver to move more aggressively. For example, forum participants suggested through a participant poll that support for a 45% reduction in GHG emissions by 2030 was polarized, with respondents feeling it was either too aggressive or not aggressive enough. Further dialogue indicated general support for emissions targets, but concerns emerged about the timeline due to, for example, technological readiness and cost. Other respondents asked for more aggressive targets, including one comment from a youth engagement session suggesting that from a global perspective, wealthier countries have means and responsibility to aim higher.

Goals

Most agencies and organizations identified alignment with or support for the long term goals for each sector. For example, the Vancouver International Airport Authority identified an aligned carbon neutral goal for 2050, while feedback from TransLink identified that the Mayors' Council was

exploring a proposed 65% reduction of greenhouse gas emissions from 2010 levels by 2030 from personal transportation (light duty vehicles) in alignment with the draft *Clean Air Plan.*

Concerns about goals included the terminology used. For example, for some the term (and intention) of 'zero emission' technologies caused concern and they suggested that 'lower emission' technologies are more achievable. Industry feedback noted that the pathways to carbon neutrality for industrial facilities were not clear. There were also suggestions to include demand management as a goal, for instance the value of active transportation including cycling. Some agriculture sector respondents indicated they are struggling with the goal of carbon neutrality. Another suggestion is to go beyond carbon neutrality for agriculture, and set a goal that is carbon negative from this sector.

Actions

The bulk of the feedback was expressed as support or concerns for specific actions, though there were suggestions for additional actions or proposed revisions to the scope of actions. For example, the Fraser Valley Regional District indicated interest in applying certain actions across district boundaries while noting a concern for spill-over emissions from Metro Vancouver to the FVRD. More examples are included in Attachment 6. Some themes are:

- Acknowledgement of the cost of capital investment required in some emission reduction actions (e.g. space heating, large trucks, rail infrastructure);
- Given the scope and range of actions in the draft *Clean Air Plan*, there should be a stronger indication of priorities. One suggestion was to use the RACE approach (realistic, achievable, cost effective and equitable) in identifying priorities. Another suggestion was to present priorities in a hierarchy by applying energy conservation principles with conservation first, then efficiency, followed by a switch to renewable energy;
- Potential for duplication, overlap or lack of a harmonized or aligned approach among government regulators (e.g. the draft plan includes an action to advocate for lower carbon fuel standards which one respondent noted were lowered recently by the Province);
- Interest and support from many respondents to participate in a collaborative approach (e.g., a round table, working group, pilot project) in implementing the plan; and
- Need to consider tailored support for small operations and businesses (e.g. a small agriculture operator, a trucking firm with 1 to 3 vehicles) and consider scale of investment, opportunities for coordinated investments etc.

In committing the region to becoming carbon neutral by 2050, Metro Vancouver will continue to work with industry stakeholders to find the most cost effective solutions to reducing greenhouse gas emissions in this sector and leveraging innovation and collaboration initiatives that will create new economic opportunities for leaders in carbon neutrality and zero emission solutions. Staff will also investigate connections to the Regional Economic Prosperity Service, as well as partnership opportunities that tap into the Sustainability Innovation Fund.

Equity

An approach to considering equity in the plan development and implementation was introduced. There is feedback on equity from many audiences, and it is worth noting that the characterization of equity itself shifts for different audiences. In general, youth considered equity as intergenerational and also at a global scale. Some industry responses considered equity in terms of the distribution of

costs and benefits. Others considered equity in terms of health impacts on individuals, or cumulative impacts on specific communities. A selection of comments on equity are included in Attachment 6.

Additional considerations

Some examples of additional considerations raised that are not directly addressed in the plan include:

- Downloading impacts of climate actions onto rural communities (e.g., increased mining to generate battery metals);
- The need to address methane leaks;
- Use of low-carbon fuels as a pathway to compliance;
- Suggestion to identify a role for business and industry associations;
- Need for economic modelling in addition to emission modelling (e.g., changes in employment) or business cases that assess costs and benefits.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

There are no financial implications stemming from this report. All costs incurred in engagement on the draft *Clean Air Plan* are within the approved 2021 budget.

CONCLUSION

Metro Vancouver concluded an engagement program for the draft *Clean Air Plan* on June 15, 2021. The program was designed to raise awareness of the draft plan, provide accessible information and tools to provide feedback and pursue meaningful conversations with those more likely to be impacted by implementation of the plan. Promotions for the engagement reached over 200,000 residents and staff engaged with over 40 stakeholder agencies, businesses and associations. About 100 individual responses were received through direct correspondence, feedback forms and captured in meeting notes. This report shares highlights of that feedback.

Staff are assessing the feedback for the purpose of revising the draft plan, and presenting a proposed final *Clean Air Plan* to the Board in fall 2021.

Attachments

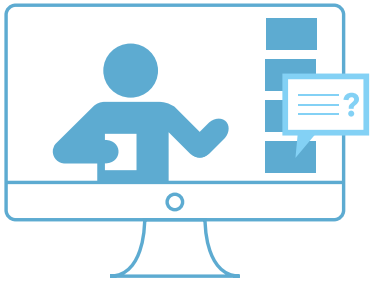
1. Engagement reach infographic for the draft *Clean Air Plan* *(46292427)*
2. Social media to promote the draft *Clean Air Plan* *(46361878)*
3. Youth engagement on the *Clean Air Plan* *(46326046)*
4. List of audiences connected with in the *Clean Air Plan* engagement *(46284423)*
5. Stakeholder meetings where *Clean Air Plan* was a substantial portion of the conversations *(46266796)*
6. Sample extracts from feedback forms, correspondence, meeting notes *(46299666)*

References

1. Clean Air Plan introductory video
2. Clean Air Plan web resource
3. Clean Air Plan online feedback form

46294458

Clean Air Plan Engagment
Participation Highlights



Public forums and webinars

300 participants

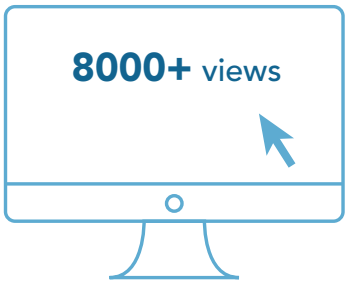
Stakeholder forums

Buildings | Industry | Transportation

80 participants

50+ detailed online feedback forms

Web resource visitors



Discussions with stakeholders

15+ invited presentations and Q&A

Social Media reach

200K+ saw the information

Social interaction

6500+ clicked, shared, commented and liked

Project team emails

70+ composed written feedback

Introductory video views

5000+ watched the video

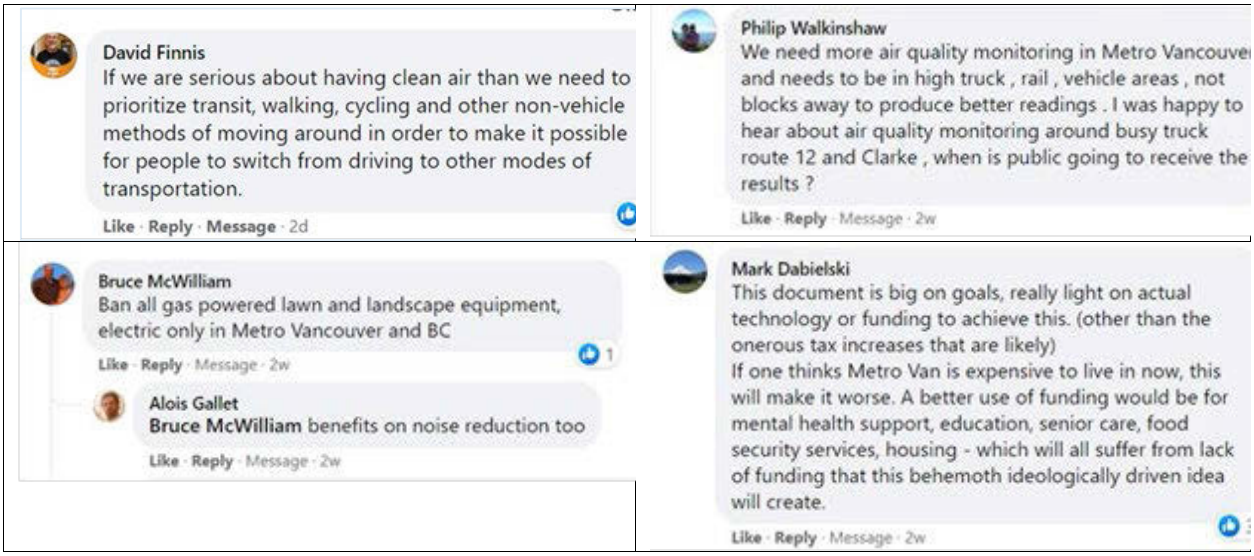
ATTACHMENT 2

Social media to promote the draft *Clean Air Plan*

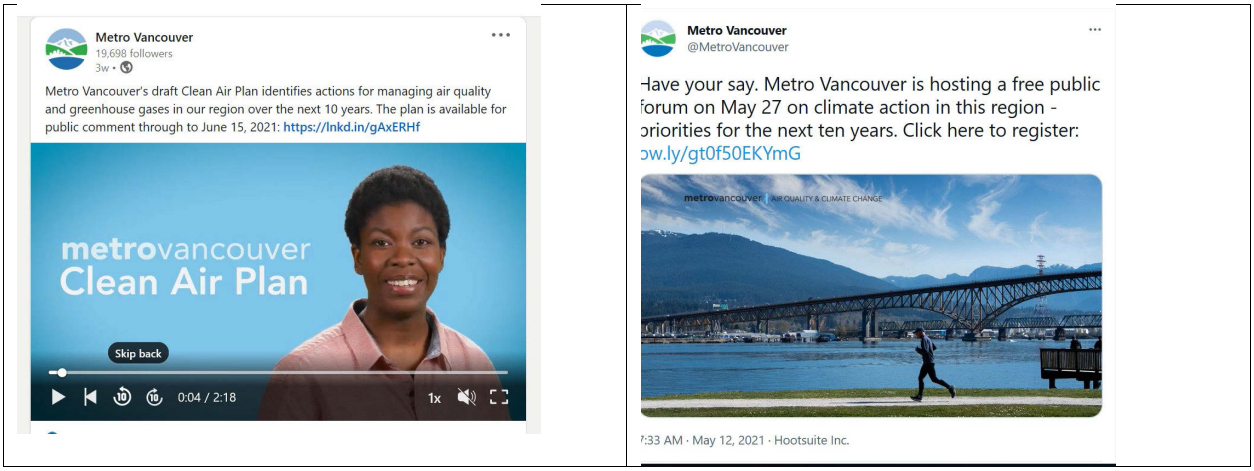
Social media was used to meet the engagement plan objective of raising the awareness of the plan purpose and benefits and to drive readers to the web resource for information or to register for events.

Staff posted regularly to corporate channels (LinkedIn, Facebook, Twitter, Instagram). The plan included a media buy, which increased presence on youth-focused platforms (i.e. Instagram) using engaging images and polling, and expanded reach to a less typical audience using community platforms (i.e. TriCityNews.com, VancouverisAwesome.com, Curiocity etc.). In addition, community partners amplified the reach of the social media to their own networks.

Examples of social media comments.



Examples of social media posts

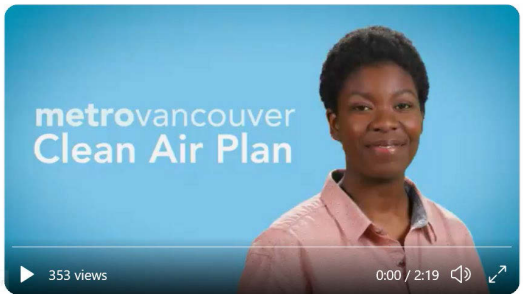


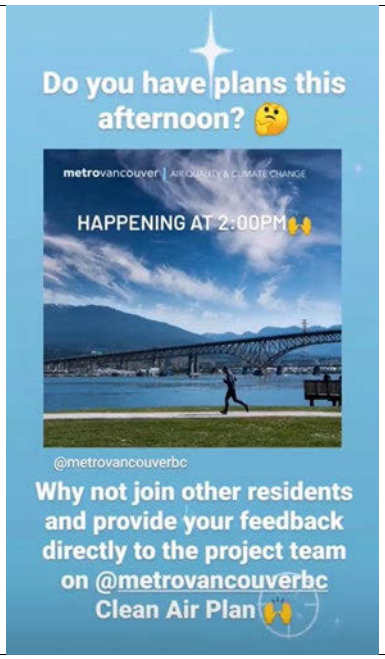
Tweet

Metro Vancouver
@MetroVancouver

We are seeking public input on a draft Clean Air Plan that will aim to reduce GHGs by 45% of 2010 levels by 2030. Learn more about the plan and share your feedback: ow.ly/LhTY50EXW7W

#climateaction #climate2050 #airquality





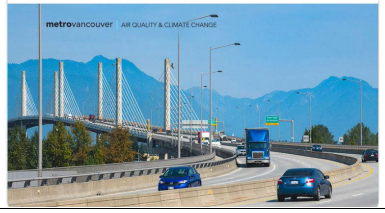
City of Vancouver - Greenest City @greenestcity · Apr 25
Are you interested in air quality and climate change in our region? Check out Metro Vancouver's draft Clean Air Plan and share your thoughts: ow.ly/v6Es50EnHfp

#airquality #climateaction **#climate2050**

2 8 12

CityHive @cityhivevan · May 4
Have your say in a part of #MetroVancouver's climate future!

> **Metro Vancouver** @MetroVancouver · Apr 27
> Check out Metro Vancouver's draft Clean Air Plan, the proposed plan for managing air quality and GHGs over the next 10 years. The draft plan is available for public comment through to June 15: ow.ly/v6Es50EnHfp
>
> #airquality #climateaction #climate2050



46361878

ATTACHMENT 3

Youth Engagement on the *Clean Air Plan*

The engagement plan included a focus on youth audiences, including K-12, college and early career. Social media outreach included an emphasis on youth-preferred platforms and a young host was chosen to host the introductory video on the draft *Clean Air Plan*. Metro Vancouver's Youth4Action team provided opportunities to hear from students across the region.

Metro Vancouver holds many conversations with youth exploring the crossroads between youth leadership and sustainability. The *Clean Air Plan* team joined some of Metro Vancouver's Youth4Action sessions, where staff introduced the *Clean Air Plan* and co-hosted dialogue sessions along with youth leaders.

The Youth4Action team provided these comments to summarize the input from youth education and engagement activities. The team noted the following bullets reflect typical perspectives shared through participation in Youth4Action programs. They are non-exhaustive and are adapted from dialogue facilitated by the Youth4Action team at events from March through June 2021.

- Youth leaders are incredibly passionate about climate action, and see the issue as an emergency. They are eager to take action at school and in the community and to educate their unique networks on sustainability topics with the goal of creating *systemic* change. Often, school-based green teams are informed by a feeling of urgency.
- Youth leaders appreciate the opportunity to engage with complex local sustainability issues, and have expressed that they feel more equipped to contribute meaningfully to discussions around

climate solutions, policies, and programs when they have been supported to enhance their understanding.

- Youth leaders typically have an advanced and nuanced understanding of the relationships between justice, equity, diversity, inclusion and action on climate change. They often regard First Nations inclusion as an indispensable aspect of progressive climate solutions.
- Youth leaders often don't feel their concerns are heard or valued by adults. They are often frustrated by not being included in decision-making processes and can be skeptical that governments and officials will follow through on commitments made to address climate change.
- When conversations about climate action have been facilitated between Metro Vancouver staff and students, youth consistently express gratitude for having their perspectives heard and valued, and that they wish this was the norm in other areas of their lives.

In addition to these dialogue sessions, youth were engaged through social media platforms and encouraged to send in feedback (see quote from young resident in Attachment 6 to the report 'Highlights from Engagement on Draft *Clean Air Plan*', dated June 24, 2021).

46326046

ATTACHMENT 4

List of Audiences Connected with in the *Clean Air Plan* Engagement

This attachment includes examples (and is not comprehensive) to demonstrate the range of organizations and individuals encouraged to review the draft plan, attend presentations and submit feedback on the draft *Clean Air Plan*.

Public
Clean Air Plan subscribers list (1,400), Metro Vancouver Sustainable Region subscribers list (5,000), Youth4Action, reach through social media

Other Governments
Member Jurisdictions (and Electoral Area A), First Nations, BC Ministry of Energy, Mines and Low Carbon Innovation, Ministry of Finance - Economic Forecasting and Analysis, BC Ministry of Agriculture, Food and Fisheries, Agricultural Land Commission, BC Ministry of Environment and Climate Change Strategy, BC Climate Action Secretariat, BC Ministry of Transportation and Infrastructure, Fraser Valley Regional District, Transport Canada, BC Ministry of Jobs, Economic Development and Competitiveness, Natural Resources Canada, Health Canada

Non-Profit Organizations
David Suzuki Foundation, HUB Cycling, Zero Waste Canada/Zero Waste BC, Vancouver Native Housing Society, Vancouver Aboriginal Friendship Centre Society, BC Non-Profit Housing Association, Victoria Transport Policy Institute, Fraser Basin Council, Urban Development Institute, Canadian Centre for Policy Alternatives, Pembina Institute, Eco Justice, BC Lung Association, Foresight

Committees (advisory and similar)
Metro Vancouver Agricultural Advisory Committee, Regional Engineers Advisory Committee, Township of Langley Agriculture Advisory and Economic Enhancement Committee

Partner Agencies or Organizations with statutory responsibilities in air quality, health, or related areas
Vancouver International Airport Authority, Fraser Health Authority, Vancouver Coastal Health Authority, First Nations Health Authority, Vancouver Fraser Port Authority, TransLink

Energy Utilities
FortisBC, BC Hydro

Industry and Business Associations
Business Council of British Columbia, Railway Association of Canada, Vancouver Economic Commission, British Columbia Trucking Association, New Car Dealers Association of British Columbia, Canadian Fuels Association, BC Greenhouse Growers Association, Electric Mobility Canada, Urban Design Institute, BC Council of Forest Industries, Cement Association of Canada, BC Construction Association, Building Owners and Managers Association, British Columbia Automobile Association, Home Performance Stakeholder Council

Businesses
Parkland Refining, Zen Clean Energy Solutions, Perkins & Will, Modo (Car Share), NEXT FMS, MBS Equipment Company Canada, West Coast Reduction, Lehigh Hanson, Lafarge Canada, Suncor Energy, Purolator

Academic Institutions
British Columbia Institute of Technology, Langara College, UBC Clean Energy Research Centre, Pacific Institute for Climate Solutions (UVIC), Clean Energy Canada (SFU), SFU Renewable Cities Program

46284423

ATTACHMENT 5

Stakeholder Meetings where *Clean Air Plan* was a Substantial Portion of the Conversations (non-exhaustive)

Audience	Engagement Activity	Timing
Metro Vancouver Agricultural Advisory Committee	Presentation with Q&A session	April 22, 2021
Public	Public Forum	April 27, 2021
Buildings Sector	Stakeholder forum	April 28, 2021
Transportation Sector	Stakeholder forum	May 5, 2021
Regional Engineers Advisory Committee (REAC)	Presentation with Q&A session	May 7, 2021
Province of BC	Presentation with Q&A session	May 12, 2021
Industry Sector	Stakeholder forum	May 19, 2021
Metro Vancouver Youth4Action	Leadership Clinic	May 19, 2021
Public	Public Forum	May 20, 2021
Township of Langley Agriculture Advisory and Economic Enhancement Committee	Presentation with Q&A session	May 26, 2021
Clean Energy Canada	Presentation with Q&A session	May 27, 2021
BC Trucking Association	Presentation with Q&A session	June 1, 2021
Metro Vancouver Youth4Action	Leadership Clinic	June 2, 2021
Home Performance Stakeholder Council	Presentation with Q&A session	June 7, 2021
Energy, Environment and Climate Committee of Business Council of British Columbia	Presentation with Q&A session	June 8, 2021
Foresight	Presentation with Q&A session	June 8, 2021
Mechanical Contractors Association of BC	Presentation with Q&A session	June 15, 2021
InnovateBC	Presentation with Q&A session	June 23, 2021

Pre-engagement conducted in-between Phase 1 and Phase 2 (January 2021 – March 2021)

Audience	Engagement Activity	Timing
Public	Agriculture webinar	February 2, 2021
Public	*Clean Air Plan* webinar	March 9, 2021
BC Ministry of Environment Annual Interagency Workshop	Presentation with Q&A session	March 9, 2021
Lower Fraser Valley Air Quality Coordinating Committee	Presentation with Q&A session	March 11, 2021
REAC-Climate Protection Subcommittee	Presentation with Q&A session	March 17, 2021

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ATTACHMENT 6

Draft Clean Air Plan engagement - sample extracts from feedback forms, correspondence, meeting notes

I'm rather doubtful we can meet the first target, as long as we keep thinking that if we just change the technology, we can continue consuming at ridiculously high levels (collectively, I mean -- obviously there are many poor people who consume little). LED Christmas lights initially cut our energy usage -- but we quickly made up for it by purchasing and using far more lights! Houses where I live used to be allowed walkout basements only; now they have deep in-ground basements that require more concrete, more HVAC and the use of pumps to keep them dry. Where old houses had 3 or 4 outdoor lights, now it's often 20 or 30. Even if those are LEDs, still, we're missing an opportunity to really make a dent in our carbon emissions. I could go on and on: larger vehicles, more electronic devices, more possessions. We need an attitude shift!

- Resident

Metro Vancouver is to be commended for the Goals and Actions in the draft 2021 Clean Air Plan. We recommend minor wording changes that could potentially lead to broader and more effective action in this region, specifically in outreach and motivation. Recommendations include [edited for length]:

- Metro Vancouver commit to collaborate with non-profit groups that have the capacity and expertise to communicate and motivate broadly.
- Expand 'scope' of outreach and awareness beyond residents, and include large organizations/ employers.

- Non-profit organization

Transitioning to clean electricity should be prioritized over other forms of renewable energy such as wood waste, biofuels and renewable natural gas to ensure that we will also improve regional air quality and the health of residents while reducing greenhouse gas emissions. This significant transition of our energy sector provides an unprecedented opportunity to protect the health of the population and associated societal costs from air pollution, if done well.

- Vancouver Coastal Health's Health Protection Program.

I would've preferred a more aggressive GHG emissions reduction target considering that higher-income countries should take on more responsibility. A 50% minimum requirement with a 60% target would've been preferable.

- Youth involved with the Sustainabiliteens movement

BCTA supports the notion of mandating the BC Zero Emissions Vehicle Act to extend zero emission vehicle sales requirements to medium and heavy-duty on-road vehicles, in recognition of market availability, access and vehicle reliability. […] This is a significant challenge given there are limited options currently available, and even as equipment comes to markets, the lead times to develop fleet penetration are long. We are hopeful we will see the first heavy-duty fully electric zero emission vehicle in BC in 2021, but it is critically important to recognize that the state of commercial zero emission vehicles is nearly 1.5 decades behind that of passenger vehicles.

- BC Trucking Association

Metro Vancouver's Clean Air Plan 2021 sets ambitious goals towards improvements in local air quality that will benefit not only Metro Vancouver's residents, but also your neighbors, including the FVRD.

The FVRD is currently working on our own Air Quality Management Plan (AQMP), to be finalized in September 2021, and it is encouraging to see a significant number of shared goals and opportunities for further collaboration emerge.

- Fraser Valley Regional District, staff

Tsleil-Waututh Nation is in agreement with this statement and supportive of bold action to reduce GHG emissions in the region. We need to accelerate our regional climate actions to avoid dangerous levels of climate change. The Clean Air Plan is the action plan that will directly address greenhouse gas emissions form sources in this region, supporting the vision of Climate 2050.

Beyond providing services to their communities, TWN and other Coast Salish First Nations have a stewardship obligation to protect the lands, waters and wildlife within their traditional and unceded territorities. TWN's snəẃəyəɬ, or ancestral law, provides TWN with legal principles that inform our stewardship responsibilities and obligations to our lands, waters, and səlilwətaɬ (Tsleil-Waututh people) including past, present, and future generations. [Comment in regards to Clean Air Plan content on Roles and Responsibilities]

- Tsleil-Waututh Nation

Metro Vancouver should undertake a thorough cost-benefit analysis that provides a transparent representation of the proposed strategies and actions so that the stated Clean Air Plan principle of equitable distribution of benefits and costs can be clearly reviewed and understood by all stakeholders.

The recent shift by Metro Vancouver as a regional authority to propose regulating industrial greenhouse gases (GHG) in addition to MV's current role of regulating industry's conventional air contaminants (CACs) is concerning. Given the significant initiatives already in effect and under development in both provincial and federal jurisdictions, Canadian Fuels Association recommends that Metro Vancouver not duplicate efforts on GHG emissions.

- Canadian Fuels Association

Comments related to equity (as referenced in the Committee Report)

FortisBC indicated support for Metro Vancouver's Climate 2050 and Clean Air Plan commitment to seek fair, equitable solutions that address affordability, as individual customers will reduce their energy consumption and their energy bills.

Tsleil-Waututh Nation commented 'pleased to see consideration of social equity in the context of climate change impacts and actions. First Nations communities are also disproportionately impacted

by climate change. Policies and programs that reduce emissions should support an equitable distribution of benefits and costs – How will this be implemented and monitored?'

CityHive, through a guest presentation in the public forums, noted 'The Clean Air Plan resonated with things CityHive hears from youth, especially with regards to the equity implications of decisions.'

Participants in the stakeholder forum on buildings asked that any incentive programs consider equity and that there should be common approaches to equity in the region.

Participants in the stakeholder forum on transportation asked that equity be specifically considered in any preparation for mobility pricing.

Participants in the stakeholder forum on industry noted that:

- From a human health perspective, there are huge discrepancies in the population from a health outcome perspective. Those living closer to large emitters, roadways, areas vulnerable to climate impacts (e.g. flooding, wildfire smoke) – more likely to end up on hospitals, more likely to feel climate impacts. These are often people that have faced racism and other systemic issues in society. Impacts can be seen in hospitals. Those that will be impacted the most will be those that don't have the resources to mitigate some of these impacts.
- Affordability is a big issue in this region. The type of industries that provide high paying jobs goes to the carbon leakage issue as well. Maybe an issue if industries leave the region as a result of emissions policies; those high paying jobs may be lost. Affordability lens should be considered. [And this] intersects with the discussion on marginal abatement costs.
- One of Vancouver's assets is the environment, the quality of the air. This attracts other high paying industries to the region as well.

Feedback forms reflected considerations for equity in comments about wood smoke and strata incentives, for example: 'You have a rebate program on single houses when they upgrade their windows and walls. Why don't you have the same program for Strata buildings? I believe it's a more targeted project and bigger impact than single houses. I don't think it's right NOT to give the same support to Strata buildings as you do to single houses. Why (do) you omit Strata buildings?'

Business Council of BC members raised considerations around equity and noted failing to attract businesses and jobs would be a missing part of the evaluation.

In the public forums there were requests to better consider equity, and queries on how this will be accomplished.

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metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Roger Quan, Director, Air Quality and Climate Change
Megan Gerryts, Senior Advisor, Regional Economic Prosperity Service

Date: May 31, 2021 Meeting Date: July 16, 2021

Subject: **2021 Update on Regional District Sustainability Innovation Fund Projects**

RECOMMENDATION
That the Climate Action Committee receive for information the report dated May 31, 2021, titled "2021 Update on Regional District Sustainability Innovation Fund Projects."

EXECUTIVE SUMMARY
This report provides an update on 14 projects that were approved for funding in 2017 through to 2020 under the Sustainability Innovation Fund. Of the projects, two are reporting as complete, one is discontinued, and the remainder are in progress. Progress on many of the projects was slowed due to the COVID-19 pandemic.

PURPOSE
This report provides an update on projects funded under the Regional District Sustainability Innovation Fund.

BACKGROUND
The Regional District Sustainability Innovation Fund (Fund) was created by the Board in 2004 to provide financial support to Regional District projects that contribute to the region's sustainability. The MVRD Board adopted the *Regional District Sustainability Innovation Fund Policy* on June 27, 2014, with further amendments in 2016, 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, including status, amount spent, and project outcomes.

STATUS OF SUSTAINABILITY INNOVATION PROJECTS (APPROVAL YEARS: 2017 – 2020)

The table below provides information on the status of each project. Additional details are provided in the attachment. Updates on a number of the projects have been provided to the Climate Action Committee on an individual basis in previous meetings.

Project	Approval Year	Amount Approved	Status
DC Fast Charger at Metro Tower III	2017	$150,000	Complete
LumiAir: Lighting your path to Clean Air	2018	$140,000	In progress
Air Aware: Air Quality and Citizen Science	2018	$95,000	In progress

Climate Literacy Modules	2019	$160,000	In progress
Sustainable Infrastructure and Buildings Policy: Design Guide	2019	$150,000	Complete
Transit-Oriented Affordable Housing Implementation Calculator	2019	$100,000	Discontinued
Targeted Invasive Plant Grazing in Metro Vancouver	2020	$150,000	In progress
Using eDNA Sampling Technology in Regional Parks	2020	$68,000	In progress
Preventing Smoke Emissions from Agricultural Waste Management	2020	$140,000	In progress
Clean Air for Students and Schools (CLASS)	2020	$200,000	In progress
Mobile Monitoring of Fugitive and Other Industrial Air Emissions with "Flying Labs"	2020	$100,000	In progress
Building Resilience: Exploring the Potential of Renewable Energy Building Infrastructure	2020	$200,000	In progress
Net-Zero Feasibility Study for Welcher Affordable Housing Development	2020	$160,000	In progress
Step Code Implementation Impacts for Building Envelope Rehabilitation of Existing Buildings	2020	$90,000	In progress

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The projects summarized in this report had funding approved by the MVRD Board from 2017-2020. 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	Amount Spent (as of May 31, 2021)
2017 Approval Year		
DC Fast Charger at Metro Tower III	$150,000	$118,417
2018 Approval Year		
LumiAir: Lighting your path to Clean Air	$140,000	$96,554
Air Aware: Air Quality and Citizen Science	$95,000	$70,000
2019 Approval Year		
Climate Literacy Modules	$160,000	$27,664
Sustainable Infrastructure and Buildings Policy: Design Guide	$150,000	$149,510
Transit-Oriented Affordable Housing Implementation Calculator	$100,000	$0
2020 Approval Year		
Targeted Invasive Plant Grazing in Metro Vancouver	$150,000	$27,000
Using eDNA Sampling Technology in Regional Parks	$68,000	$32,555

Project	Total Amount of Funding Approved	Amount Spent (as of May 31, 2021)
Preventing Smoke Emissions from Agricultural Waste Management	$140,000	$72,400
Clean Air for Students and Schools (CLASS)	$200,000	$0
Mobile Monitoring of Fugitive and Other Industrial Air Emissions with "Flying Labs"	$100,000	$0
Building Resilience: Exploring the Potential of Renewable Energy Building Infrastructure	$200,000	$0
Net-Zero Feasibility Study for Welcher Affordable Housing Development	$160,000	$160,000
Step Code Implementation Impacts for Building Envelope Rehabilitation of Existing Buildings	$90,000	$0

The balance in the Regional District Sustainability Innovation Fund at December 31, 2020 was $11.45 million.

OTHER IMPLICATIONS

At the February 2021 meeting, the Climate Action Committee directed staff to review the Sustainability Innovation Fund policies and provide recommendations for amendments for Board consideration. Report 5.5 in the Committee's July 2021 agenda package responds to that direction.

CONCLUSION

This report has presented an update on fourteen projects funded under the Regional District Sustainability Innovation Fund. The Sustainability Innovation Funds were created by the Board in 2004 to provide financial support to utility or Regional District projects that contribute to the region's sustainability.

Attachment

Update on Regional District Sustainability Innovation Fund Projects

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ATTACHMENT

UPDATE ON REGIONAL DISTRICT SUSTAINABILITY INNOVATION FUND PROJECTS

DC Fast Charger at Metro Tower III: Complete

Accelerated electric vehicle (EV) adoption is a key greenhouse gas (GHG) reduction opportunity in the transportation sector, which is reflected in the *Climate 2050 Transportation Roadmap*. To better understand EV charging needs and challenges, Metro Vancouver installed a Direct Current (DC) Fast Charger at Metrotower III with the objectives of filling a gap in the regional network of charging stations and testing an innovative two-tiered pricing system. The installation is meant to support EV charging for a wide range of user groups, including the public, Metro Vancouver's fleet and staff vehicles, and Metrotower III tenants.

The charging station was commissioned in September 2019 for public use, and implemented a two-tiered, time based pricing system, designed to incentivize users to unplug and make the station available for the next user. Users are initially charged $0.30 per minute, and after the first 30 minutes of charging, a higher tiered price of $0.50 per minute is initiated.

Staff have monitored station usage since installation and noted the following key outcomes:

- Over two thirds of charge events are under 30 minutes
- About 50% of charge events are under 20 minutes
- Only 7% of charge events are over 1 hour

These outcomes suggest that the pricing structure is having the intended effect of incentivizing shorter charge times to ensure vehicle turnover at the charging station. However, assessment of the pricing structure was impacted by the COVID-19 pandemic, which saw limited public access and equipment downtime as public health restrictions resulted in much lower use for the final 6 months of the pilot. Additionally, the charging data and user feedback captured during this DC Fast Charging demonstration project has shown that higher pricing can be a deterrent for EV users. These findings suggest that a regional pricing approach for EV charging may be a better approach while still ensuring user turnover and respectful charging etiquette.

LumiAir: Lighting your path to Clean Air: In Progress

The LumiAIR project aims to engage and educate the public through a thought-provoking and accessible visual display of air quality that allows the public to associate the data collected at Metro Vancouver air quality monitoring stations with air quality in their community. The first phase of the project is complete whereby preliminary designs were developed, focus groups were conducted, and a final design was selected. The final design incorporates public feedback from the focus groups.

Staff have initiated the final phase to build and configure the display, which includes a touchscreen interface, kiosk display, computer, and Metro Vancouver branding. The display will show real-time, current air quality data and allow comparisons to scenarios that represent community exposure to a wildfire smoke day, hot summer elevated ground-level ozone day and air quality decades ago.

Key outcomes to date:

- Conducted two public focus groups,
- Prepared three preliminary designs and selected a final design,

- Designed the user interface and kiosk to house the screen,
- Procured the display components and hardware, and
- Programmed the display to retrieve real-time data and produce a graphical representation.

Air Aware: Air Quality and Citizen Science: In Progress

Air Aware aims to understand the strengths and limitations of small, low-cost, air quality sensors; support the public in the appropriate use of these sensors; and examine the sensors' potential to augment Metro Vancouver's air monitoring network. Phase 1 is complete: staff co-located sensors at Metro Vancouver's air quality monitoring stations to compare their performance to standard instruments used in Metro Vancouver's air quality monitoring network and then lent sensors to a number of volunteer residents to learn about their experience with them. Phase 2 is underway: staff created and published a website to provide guidance to anyone interested in using small air sensors. In parallel with the website, staff drafted a technical report to summarize Metro Vancouver's research and evaluation of selected small sensors. The report is undergoing final review and will be published on the Air Aware website when completed.

Key outcomes to date:

- Deployed air sensors with 12 volunteers and gathered feedback on their experience;
- Completed first and second co-location of air sensors at Metro Vancouver's air monitoring stations;
- Completed draft of technical report, including all data analysis; and
- Published Air Aware webpages: http://www.metrovancouver.org/services/air-quality/action/air-aware/Pages/default.aspx

Climate Literacy Modules: In Progress

Climate Literacy Modules are intended as a learning tool to encourage audiences that are less familiar with climate change science and effective climate action in this region to explore and learn some of the concepts, ideas, and terminology used in climate action conversations. The outcome is that a learner will feel more confident in participating in conversations about climate solutions. The tool is designed in a series of online modules, where the learner can work through them linearly or in their chosen order and pace.

Staff have developed content for the learning modules, with input from external advisors including a K-12 curriculum development specialist, an Indigenous knowledge advisor, and a climate scientist.

The project team is in the process of moving this content into the learning module platform with interactive components including characters, white board video, knowledge testers and other tools designed to engage the learner. There are features for accessibility.

The project was put on hold in spring 2020 as project staff shifted workloads to manage changes stemming from the pandemic. The building of the learning modules is now moving quickly.

Next steps will include completing the learning modules, testing and revising the learner experience, and promotion. The audience is intentionally inclusive and this is designed as a publically accessible tool. The audiences considered includes as examples; teachers and learners, municipal staff (e.g. in

professions not currently focused on climate action), residents broadly, and similar. There is ongoing interest from other governments as the modules develop.

Sustainable Infrastructure and Buildings Policy: Design Guide: Complete

In October 2018 the Metro Vancouver Board adopted the *Sustainable Infrastructure and Buildings Policy*. This policy aims to ensure that the wide range of projects undertaken by Metro Vancouver are consistent in their approach to sustainable design and construction. Design teams are compelled to incorporate performance-based considerations for energy efficiency and GHG emissions, sustainable and efficient use of resources, and ecological health. The policy targets Leadership in Energy and Environmental Design (LEED) Gold and BC Energy Step Code Level 3 as minimum standards for occupied buildings and Envision Gold for infrastructure.

In 2019, with support from the SIF, work began to develop a *Sustainable Infrastructure and Buildings Policy Design Guide* to facilitate and support the successful application of the policy to new infrastructure and building projects as well as significant retrofits to existing infrastructure and buildings. The Design Guide was completed in March 2021, and provides detailed technical guidelines to be used by Metro Vancouver staff and consulting teams to assist delivering high performance, sustainable infrastructure and building projects.

Development of the Design Guide was led by staff in Air Quality and Climate Change with support from the CAO's office, complemented by a technical advisory group and steering committee comprising staff from each service area. Staff are now working to develop a rollout plan with training and support, and intend to bring a report in Fall 2021 to introduce the Board to the Design Guide.

Transit-Oriented Affordable Housing Implementation Calculator: Discontinued

The Transit-Oriented Affordable Housing Implementation Calculator was originally intended to communicate the development cost analysis of the Transit-Oriented Affordable Housing (TOAH) Study interactively, allowing users to "learn by doing". In the Summer of 2020, after conducting an information interview with the developer of inclusionary housing web tools, it was determined that: the potential audience for the TOAH Calculator was more limited than anticipated; user uptake would be a challenge; and the overall benefits would likely not justify the expenditure. The project team now recommends that the project not be completed.

Regional Planning and Housing staff continue to explore transit-oriented affordable housing through other projects and studies, such as a forthcoming update to the 2013 Housing and Transportation Cost Burden Study.

Targeted Invasive Plant Grazing in Metro Vancouver: In Progress

In mid-2020 Metro Vancouver initiated Phase 1 of the "Targeted Invasive Plant Grazing" project by retaining a consultant to assess the feasibility of grazing as an herbicide-free invasive plant control option. Informed by a literature review and interviews with fourteen practitioners from across Western Canada and the US, the consultant concluded that goats are the most suitable livestock species (compared to sheep, pigs, and cattle), and that targeted grazing:

- may be an effective control method for Himalayan blackberry, giant hogweed, English and Irish ivies, Himalayan balsam, Himalayan blackberry, purple loosestrife, Scotch broom, and wild chervil;
- control efficacy is likely similar to hand pulling or mowing, with repeated treatments required for long term control; and
- is logistically complex, 2-4 times costlier, and 2-5 times more carbon-intensive in Metro Vancouver at this time, due a lack of local trained herds and the need to transport herds from other areas of BC or Alberta.

During its meeting on April 16, 2021, the Climate Action Committee received a staff report and presentation summarizing these study results. Regional Parks staff are further exploring whether: a) a suitable trained local herd can be found, and b) the complex logistical requirements can be met prior to conducting a pilot project at Aldergrove Regional Park.

Using eDNA Sampling Technology in Regional Parks: In Progress

Environmental DNA (eDNA) sampling is a relatively new survey technique that relies on the detection of genetic materials collected from habitats and analyzed in a laboratory. This emerging method uses less effort than traditional sampling, is more cost-effective, and is far less invasive to sensitive fish and wildlife species. This project aims to help Metro Vancouver better understand the presence and distribution of key aquatic species to inform park management decisions and support the maintenance of ecosystem resilience in parks.

In the first year of the project staff were trained in both field sample collection and laboratory processing techniques, equipment was sourced and procured, and 5 parks were sampled for 8 species:

- Kanaka Creek, Derby Reach, Colony Farm, Minnekhada, Grouse Mountain
- Species sampled: coastal cutthroat trout, coho salmon, red-legged frog, Pacific water shrew, coastal tailed frog, western toad, rainbow trout, Oregon spotted frog
- All samples were sent to the Helbing Lab at the University of Victoria (UVIC).

The development of new primers for two local species of interest were initiated. Specimens were collected by consulting biologists and sent to the UVIC lab where they isolate the DNA. The DNA is then sequenced by an external agency and then sent back to create the new primers. Finally, these are tested against many conspecifics to ensure correct results. The Salish Sucker Technical Bulletin is complete but not yet published, and that primer is now available for public use. The Oregon Fairy Shrimp primer is still in progress.

It was helpful to learn red-legged frogs (a species at risk in BC) had moved into two of the restored wetlands that were tested in east area. Many results came back negative for species that were tested for, and that is also helpful for management. Results to date have been shared with partner groups who volunteered by helping out with the field surveys, as well as in the Regional Parks newsletter and Facebook posts. The 2020 results were also shared with the Metro Vancouver Watersheds Environmental Management team.

Preventing Smoke Emissions from Agricultural Waste Management: In Progress

Open-air burning of vegetative debris is a source of fine particulate matter and other air contaminants, including greenhouse gases, in the region. These air contaminants are harmful to public health and the environment. In 2020, the first part of this project was initiated in the form of a study to investigate the benefits and barriers to using alternatives to open-air burning for managing agricultural vegetative debris in the Metro Vancouver region. The findings of the study indicated that alternative waste management methods produce fewer emissions of both particulate matter and greenhouse gases compared to open-air burning. However, there are barriers to using alternative methods for farmers in the region, which include cost, complexity, practical feasibility, biosecurity considerations, and equipment availability. This phase of the project was completed in early 2021 and was the subject of an information report to the June 11, 2021 Climate Action Committee meeting (Reference: Climate Action Committee Agenda June 11, 2021 (metrovancouver.org)).

Work has begun on procurement of consulting services for the second phase of the project to develop a multi-language best practices guide to support the use of low-emission alternatives to open-air burning of agricultural vegetative debris. The guide will provide information for farmers about alternative waste management options for vegetative debris that avoid open-air burning, such as recycling and reusing, or methods that reduce emissions from burning. Development of the best practices guide will draw upon the findings of the first part of the project. To ensure that the guide is tailored to the Metro Vancouver region, the local agriculture sector, including farmers and representatives of farming associations, educational institutions, and BC Ministry of Agriculture, Food and Fisheries will be involved in the development of the guide. The project will also gather input from organizations and businesses that have information about local markets and specifications for the products of alternative waste management practices. This project is currently expected to be completed by the end of 2021.

Clean Air for Students and Schools (CLASS): In Progress

Clean Air for Students and Schools (CLASS) will pilot actions to reduce exposure to traffic-related air pollution in and around schools. The project will involve teachers, students, and parents so they can learn more about their exposure to air pollution and how to measure it. The project has 3 parts:

1. Partnering with schools in the Metro Vancouver region to assess the different areas for sources of traffic-related air pollution and identify ways to reduce exposure to them.
2. Piloting actions to reduce exposure to traffic-related air pollution and involving teachers, students, and parents in measuring air quality using small, low-cost air sensors, before and after implementation of mitigation actions.
3. Creating a report and teaching tools for other schools on potential ways to reduce exposure to traffic-related air pollution.

Due to the COVID-19 pandemic response, limited access to schools, and teachers' increased workload during this time, this project was put on hold in 2020 and 2021. While CLASS was on hold, staff researched other programs involving air quality at schools, such as TransLink's Youth Travel Strategy and Sonoma Technology's Kids Making Sense program, to learn about potential partnerships and existing programs' successes and challenges.

Mobile Monitoring of Fugitive and Other Industrial Air Emissions with "Flying Labs": In Progress
The aim of this project is to assess whether drone-mounted small sensor air monitoring equipment can be used to measure air contaminants effectively and accurately from emissions that are scattered, difficult to access from the ground, or not contained within a facility's site boundaries. The project is planned to be conducted in two parts. The first part involves contracting a licensed drone operator to fly a commercial drone capable of carrying small sensors to determine the feasibility of this sampling platform for investigating sources of air emissions in the Metro Vancouver region. The second part of the project is expected to focus on using the drone-mounted air monitoring equipment to more fully characterize emissions from key sources where existing monitoring and sampling techniques.

Due to the COVID-19 situation, securing the services of a licensed drone operator and a commercial drone was delayed in 2020. Ground-based mobile measurement tests were conducted using Metro Vancouver's existing small sensor equipment. In addition, progress was made in 2020 on assessing the suitability of small sensor equipment and the constraints on flying drones. Specific findings include:

- The identification of the only currently commercially available monitoring equipment that is designed to be mounted on a drone and measure a variety of air contaminants using small sensor technology;
- Limitations of currently available sensor technologies for air contaminants other than particulate matter;
- The limits on the weight of loads that can be carried by various drones;
- Location and environmental limitations on drone flights in the Metro Vancouver region; and
- The availability and required qualifications of contractors to conduct flights.

Procurement is underway to secure a contractor to conduct the first part of this project in the early summer of 2021.

Building Resilience: Exploring the Potential of Renewable Energy Building Infrastructure: In Progress
The purpose of this project is to target low emission renewable energy technology to build resiliency within affordable housing. Evaluating the feasibility of incorporating renewable energy in to building infrastructure is the first step towards understanding the role it could play in a climate resilient and low carbon region. By taking the first step, Metro Vancouver can demonstrate the feasibility of this approach within the region and lead the region in building low carbon resilience.

The project is still in early planning stages and delayed due to the COVID-19 situation requiring additional staff time and attention to stabilize operations and processes as well as support tenants through additional financial hardship. As stability returns to operational functions the project will be picked up and progressed through late 2021 and into 2022. Information gathered from the *Net-Zero Feasibility Study for Welcher Affordable Housing Development* project will support future actions.

Net-Zero Feasibility Study for Welcher Affordable Housing Development: In Progress
The purpose of this project is to study the feasibility of designing and constructing MVHC's Welcher Avenue multi-family residential affordable rental redevelopment project to a Netzero Energy (NZE)

or Netzero Energy Ready (NZER) standard. The NZE/NZER standard characterizes a building with dramatically reduced operational energy consumption compared with standard base building code designs, with the possibility of offsetting building energy consumption with on-site renewable energy generation.

This study is being completed in partnership with the Federation of Canadian Municipalities' Green Municipal Fund (FCM-GMF). If achieving NZE or NZER is determined to be feasible for the Welcher project, the construction phase may become eligible for capital grant funding through the FCM-GMF program. The FCM-GMF has specified a Total Energy Usage Intensity (TEUI) target of 80 kWh/m^2/yr. Preliminary energy modelling results from the study has shown that through innovative energy reduction strategies and design features, the building's predicted TEUI value is approximately 60 kWh/m^2/yr. Comparing this value to a BC Energy Step Code Level 4 TEUI requirement of 100 kWh/m^2/yr, the energy conservation measures proposed for the Welcher development represent a dramatic reduction in both operational energy use and greenhouse gas emissions over the life of the building even when compared to a high-performance Step Code 4 building.

Furthermore, work on this study has created another possible grant funding opportunity with the Province of British Columbia's CleanBC program, which offers cash incentives for greenhouse gas emissions and electrification of natural gas building systems. The pursuit of energy reduction strategies during the NZE/NZER study led to substituting the building's natural gas systems (heating, ventilation, air conditioning and domestic hot water) to high efficiency electric air-source heat pumps, which further supports climate policy objectives of Metro Vancouver, as well as those of the provincial and federal governments.

The NZE/NZER feasibility study will conclude in July 2021, at which time Metro Vancouver Housing (MVH) intends to submit an application for capital grant funding through the FCM-GMF program for the Welcher Affordable Housing Redevelopment project. Construction of the Welcher Affordable Housing Redevelopment project is expected to begin in the fourth quarter of 2021.

Step Code Implementation Impacts for Building Envelope Rehabilitation of Existing Buildings:
In Progress

The purpose of this project is to better understand the levels of the BC Building Code Step Code and its cost and performance implications for major renewals of MVHC's existing housing stock. The current BC Building Code is written for implementation with new building construction, but does not strictly apply to existing building renewals. A large portion of MVHC's existing housing projects were constructed approximately 40 years ago and many major building components (roofing, windows, cladding, etc.) are reaching the end of their service lives. The near future requirement of major capital investment into the existing housing stock creates the opportunity for performance upgrades to align with Metro Vancouver's strategies, plans and policies and the current building Step Code. An in-depth understanding of the economic and performance implications of the step code is of great interest as an affordable housing provider in the region.

This study will:

- create a guide for making informed decisions when designing and constructing upcoming major building renewals.
- provide insight on performance metrics (energy consumption, greenhouse gas emission).

- Provide insight on marginal and long-term maintenance costs.

Housing's Capital Maintenance team have been working with Pembina on a related project, Reframed (deep retrofits). Pembina have been working with RDH and have produced a draft report that contains information that will overlap well with the SIF Step Code Implementation Impacts for Building Envelope Rehabilitation of Existing Buildings research and report. Now that the Pembina report is completed in draft, Metro Vancouver Housing are working with RDH Consultants to obtain a proposal to build on the Pembina report and conduct additional research to develop the specific requirements and cost implications to achieve the various Step Code levels in existing buildings. Additionally, a change to the BC Building Code is coming with respect to rehabilitation of existing buildings. Metro Vancouver Housing are making efforts to collaborate with the team working on the Code upgrade to ensure information and work efforts are being shared to enhance both projects.

To: Climate Action Committee

From: Ken Reid, Superintendent, Environmental Sampling and Monitoring
Kyle Howe, Air Quality Analyst
Parks and Environment Department

Date: June 22, 2021 Meeting Date: July 16, 2021

Subject: **Lower Fraser Valley Ambient Air Quality Monitoring Network Review 2021**

RECOMMENDATION

That the Climate Action Committee receive for information the report dated June 22, 2021, titled "Lower Fraser Valley Ambient Air Quality Monitoring Network Review 2021".

EXECUTIVE SUMMARY

Metro Vancouver commissioned a consultant's review of its network of air quality monitoring stations. The review found that Metro Vancouver operates one of the most comprehensive ambient air quality monitoring networks in the world. The report identified 13 recommendations to further strengthen the network so that it continues to be world-leading. These recommendations include improving spatial coverage of the permanent monitoring network (including adding a station in the Surrey/White Rock area), integrating lower cost sensors, and improvements in odour monitoring. These recommendations will be considered by staff as part of ongoing planning for network improvements. Metro Vancouver's new air quality management plan, the *Clean Air Plan*, has identified the need for the network to be reviewed every 5-10 years.

PURPOSE

To provide the Climate Action Committee with the findings of a consultant study, the *Lower Fraser Valley Ambient Air Quality Monitoring Network Review*, and future directions for the network and Metro Vancouver's air quality monitoring capabilities.

BACKGROUND

Metro Vancouver operates a comprehensive network of air quality monitoring stations, with 31 stations from Horseshoe Bay to Hope, that provide the technical foundation for the air quality management program. From time to time, Metro Vancouver commissions a third party review of the network, to ensure it is responsive to changing needs and technologies. This report conveys the findings and recommendations of a consultant's review of the network, and recommendations for continued improvements to the network and Metro Vancouver's air quality monitoring capabilities.

Metro Vancouver's draft *Clean Air Plan* outlines over 50 actions under the issue area of "Measure, Monitor and Regulate", which rely on a robust air quality monitoring network. Many other actions in the *Clean Air Plan* rely on the analysis of regional air quality trends and how air quality changes across the region. The draft *Clean Air Plan* was informed by the network review and has identified the following directions for the network:

- Enhance monitoring network with low cost and portable sensors, near-road and community monitoring, and carbon dioxide monitoring.
- Measure the changing climate and the impacts to air quality, including visual air quality.
- Develop and implement a user-friendly open data portal, so the public and researchers can more easily access and use data collected by Metro Vancouver.
- Explore options to improve rapid monitoring capabilities during air quality emergencies.
- Review monitoring network every 5-10 years to respond to regional changes, emerging issues and help protect human health and the environment.

THE LOWER FRASER VALLEY AIR QUALITY MONITORING NETWORK

Metro Vancouver operates a network of air quality monitoring stations that provide the basis for air quality planning, including determining compliance with air quality objectives and standards, tracking air quality trends, and providing information to the public. The Lower Fraser Valley Air Quality Monitoring Network comprises 31 stations that continuously monitor air contaminants throughout the airshed. Recognizing the shared nature of the airshed, six of the stations are located in the Fraser Valley Regional District (FVRD), and these stations are operated by Metro Vancouver under a service agreement with the FVRD. In addition to continuous instruments at these stations, some also include instruments being operated to collect samples that are submitted for detailed laboratory analysis of numerous air contaminants. Complementing the fixed stations of the air quality monitoring network are portable and special study instruments, including the mobile air monitoring unit (MAMU), that can be moved throughout the region to investigate local air quality issues.

The network provides the foundation for developing new air quality and climate policy and is a key component of the Measure, Monitor and Regulate issue area identified in the draft *Clean Air Plan.* The network supports both of the long term goals set in the draft *Clean Air Plan* by providing a world-leading monitoring network and providing data directly to Metro Vancouver residents about current air quality. Air quality in the region is monitored and reported in real-time, in order to respond to emerging air quality issues (e.g. wildfire smoke and air quality advisories).

REVIEW OF THE EXISTING NETWORK

Regional air quality monitoring is a balance of utilizing highly sensitive equipment, selection of monitoring locations that are representative of broad areas, and continuous maintenance and calibration to ensure data are of the highest quality. As the science of measuring air quality improves over time, the monitoring network needs to adapt to integrate emerging technology and evolve with the latest scientific and health research. In 2020 a consultant's study was commissioned to provide a review of the Lower Fraser Valley Air Quality Monitoring Network. The full report and Executive Summary (Attachment) was received in May 2021.

The *Lower Fraser Valley Air Quality Monitoring Network Review* provides a comparative analysis of the network against other jurisdictions across Canada, the United States, and globally, to understand where our network excels and identify areas where the network could improve. The consultant found that on a population basis, the network is a world-leader when compared to other large jurisdictions such as Montreal, London, UK, and the South Coast Air Quality Management District (California). In addition to having high spatial coverage, the network also monitors for a robust set of air contaminants and is in line with other major metropolitan networks across Canada and the world.

Improvements to the air quality monitoring network are guided in part by third-party consultant reviews, an understanding of best practices from around the world, and by staff working closely with senior levels of government, health agencies, researchers, member municipalities and others. *The Lower Fraser Valley Air Quality Monitoring Network Review* evaluated the status of recommendations from the previous network review and demonstrated that significant improvements have been made to the network. Of the 18 recommendations in the previous review, 11 have been completed and another 4 are either in progress or have been planned. The remaining recommendations have been re-evaluated in this current review. Highlights of network changes in the last decade include:

- Created public real-time air quality data website (airmap.ca)
- Added stations in New Westminster and Delta (Tsawwassen) to monitor a number of contaminants including fine particulate matter, ozone and nitrogen oxides
- Added stations in Mission and Agassiz to enhance monitoring of ground-level ozone, as well as fine particulate matter and nitrogen oxides
- Replaced continuous fine particulate monitoring instruments at all stations with new technology capable of measuring portions of fine particulate that could not be measured previously
- Performed near-road special study and established a permanent near-road monitoring station
- Established a core set of permanent more heavily instrumented “Super Sites” distributed across the length of the Lower Fraser Valley
- Added monitoring related to diesel particulate matter
- Expanded portable monitoring capabilities, including a new mobile air monitoring unit (MAMU)
- Added more visual air quality monitoring sites
- Performed neighbourhood-scale special studies
- Reduced carbon monoxide monitoring
- Developed in-house capabilities for comprehensive data analyses, and
- Upgraded the air quality data acquisition system.

RECOMMENDATIONS FOR FUTURE DIRECTION OF THE NETWORK

In recent years, consumer grade sensor technology has expanded in popularity as it provides low-cost options for measuring air quality. As reported to the Committee in November 2020, staff recently completed the Air Aware project, which conducted an analysis of existing consumer grade sensor technology. In addition to the emergence of consumer grade sensors, there has also been an increase in mid-tier (or professional grade) sensors, which do not have the same accuracy as the regulatory instruments used in the network, but provide more reliable data than the consumer grade sensors.

Embracing both the consumer grade and mid-tier sensor technologies is critical for the network to continue to evolve. Numerous studies have demonstrated that these consumer and mid-tier sensors provide valuable supplementary data as part of a larger, high quality network. These types of sensors could also be used to enhance the specialized air quality studies conducted by Metro Vancouver, including high resolution community monitoring, both by being more affordable and requiring a significantly smaller footprint to install and operate. Integration of these types of sensors will require further development of data analytics and data processing tools.

The full list of the 13 recommendations from the consultant's report is as follows:

Improve Spatial Coverage of the Permanent Monitoring Network – Increasing population density south of the Fraser River should be considered as a factor for investigating the installation of a new permanent monitoring station. Based on projected population growth for the region and the current spatial distribution of the network, the consultant has recommended an additional monitoring station be developed in the Surrey/White Rock area. In addition to improving spatial coverage in dense areas, the report also suggests monitoring in more rural and wilderness areas within the region, some of which could be done with emerging sensor technologies.

Integrate Lower Tier Sensors into the Network – Professional and consumer grade air quality sensors present an opportunity to supplement the regulatory monitoring network, increase spatial coverage and increase community engagement. Care must be taken when interpreting the data from these sensors as they may have limitations when compared to the high quality data collected in the regulatory network.

Improve Odour Monitoring – Consider implementing a complementary yet less formal system than the current air quality complaint system to allow for easier reporting of odours across the region.

Add Carbon Dioxide Measurements – Explore how local monitoring of CO_2 could provide information on the effectiveness of policy measures and to aid in determining emission factors.

Audit Air Quality Monitoring Stations - Review permanent monitoring station locations every one to three years to ensure the site continues to meet original siting criteria and that measurements are suitable for their intended purpose.

Expand Documentation – Develop and provide information regarding standard operating procedures, quality assurance and quality control activities, instrument audit procedures and calibrations, and station-specific metadata.

Provide Air Quality Health Index (AQHI) for each Monitoring Station – Currently the Lower Fraser Valley has six AQHI zones, while the network has 19 stations which provide sufficient data for calculating a station-specific AQHI.

Add Second Near-Road Station – The *Metro Vancouver Near-Road Air Quality Monitoring Study* completed in 2020 recommended that additional near-road monitoring is conducted in the region.

Re-Establish Remote Monitoring Station – In partnership with Environment and Climate Change Canada and BC Ministry of Environment and Climate Change Strategy, Metro Vancouver contributed to the operation of a Canadian west coast background monitoring station in Ucluelet from 2010-2017.

Expand Ancillary Information – Expansion of data not directly related to the network but which supports air quality programs and assessments. This could include traffic data from across the region, additional data on wildfire impacts, and increased detail of the emission inventory.

Expand the Use of Speciation Data – Improve the utilization of non-continuous speciation data (which examines the chemical composition of e.g., total fine particulate matter or total volatile organic compounds) already being collected within the network. Incorporating analysis of this data

into the air quality program would further support policy work, environmental assessments and identification of emerging air quality issues.

Reduce Carbon Monoxide Monitoring – Further reductions in carbon monoxide monitoring could be made, as data indicates concentrations are well below existing air quality objectives and standards throughout the region, with resources re-purposed to higher priority monitoring.

Continue Performing Special Studies – Specialized air quality studies were identified as important to understand neighbourhood-scale exposure to contaminants and to conduct monitoring in locations where there is no permanent monitoring stations.

The consultant's full report and the 13 recommendations will be considered by staff in planning for network improvements, and reported to the Climate Action Committee upon implementation. Continual improvement in air quality monitoring in the Lower Fraser Valley will aid in development of air quality policy and will support the goals set out in the *Clean Air Plan*. By leveraging the large amount of real-time and historical data, Metro Vancouver is well positioned to continue improving our air quality and identifying emerging air quality trends.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

The cost of the consulting review of the Lower Fraser Valley Ambient Air Quality Monitoring Network was included in the ambient air quality monitoring program budget in 2019 and 2020. The Fraser Valley Regional District contributed financially to the cost of the review and the work was done in partnership with the FVRD. Planned improvements to the network as a result of the recommendations in this report will be included in future budget requests.

CONCLUSION

The Lower Fraser Valley Ambient Air Quality Monitoring Network provides air quality monitoring services to the region and is a key part of developing policy, monitoring real time air quality and supporting air quality management. Reviews of the network are conducted periodically, and a consultant was retained to review the network and provide recommendations for future improvements. The review indicated that Metro Vancouver operates a world-class ambient air quality network but can continue to improve by considering a list of 13 key recommendations for implementation.

Attachment

Executive Summary - Lower Fraser Valley Air Quality Monitoring Network Review (RWDI, 2021)
(46558933)

References

1. Air Aware & Small Sensors
2. Metro Vancouver Near-Road Air Quality Monitoring Study

46256643

Executive Summary

Introduction

The Metro Vancouver Regional District (MVRD) has been operating an ambient air quality monitoring program within its jurisdiction since 1972. In 1998, in partnership with the Fraser Valley Regional District (FVRD) and the province of British Columbia, the MVRD integrated the air quality monitoring function for locations within the FVRD into a single air quality monitoring network (the Network) serving both regional districts located in the Lower Fraser Valley (LFV) airshed. While MVRD operates the Network, ongoing commitments to the Network operations are made by the FVRD under a service agreement with MVRD. On-going commitments to the Network are also made by federal, provincial, and other stakeholders.

The core of the existing Network consists of 31 fixed long-term air quality monitoring stations in the LFV airshed and 1 mobile air monitoring unit. Air quality sampling is conducted with continuous instruments connected to a central data acquisition system and also with non-continuous sampling technologies, where samples are collected for detailed analysis in a federal laboratory. Meteorological monitoring instruments, located at most stations, are an important component of the Network. The MVRD also participates in special studies using portable or semi-portable monitoring equipment in support of neighbourhood-level monitoring and the development of air quality improvement plans.

Objectives

RWDI was retained by the MVRD to conduct a review of the LFV ambient air quality monitoring network, specifically to assess the current state of the Network, identify emerging air quality issues that may require additional monitoring, and provide recommendations for modifications to the Network to ensure MVRD continues operating a world-class air quality monitoring network. Not part of the scope was a review of the Network objectives that were identified in the 2008 assessment. However, it is RWDI's impression that these objectives remain applicable and valuable.

Results

This report includes a review of other large air quality monitoring networks and has identified the air quality monitoring network operated by MVRD as a world-class network especially with respect to its permanent network using tier 1 regulatory grade sensors. Table 1 below summarize the reviewed networks and provide a comparison between the networks.

Table 1: Comparison of evaluated networks

	LFV	Ontario	Montreal	London	Seoul	SCAQMD	Puget Sound
*Number of Continuous Stations	31	39	15	100	65	40	23
Population (Millions)	2.8	14.6	1.9	8.9	9.7	18	4.1
Density (stations per million people)	12.5	2.7	7.9	11.2	6.7	2	5.6
Area Served (km^2)	36,303 *	1,076,000	500	1,569	605	17,000	17,820*

Coverage (km^2 per station)	1,037	27,590	33	16	9	25*	775
Station Types	Urban, Rural	Urban, Rural	Urban	Urban, Rural, Curbside, Roadside	Urban, Rural, Roadside	Urban, Rural	Urban, Rural, Roadside
Criteria Contaminants	CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, SO_2, TRS	CO, NO_2, O_3, $PM_{2.5}$, SO_2	CO, NO_2, O_3, $PM_{2.5}$, SO_2	CO, NO_2, O_3, PM_{10}, $PM_{2.5}$	CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, SO_2	CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, SO_2, Pb	CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, SO_2
Additional Parameters	Black Carbon, VOCs, PAHs, Visibility,	N/A	Black Carbon, VOC, PAH	Black Carbon, VOCs, PAHs, Visibility,	Photochemical, Deposition, VOC, heavy metals, THC, CH_4, PM_1	Photochemical, Deposition, VOC, heavy metals, THC, CH_4, PM_1	Black Carbon, VOCs, PAHs, Visibility, Carcinogens
Major Pollution Sources	Traffic, Wood Burning, Construction, Industrial sites, Punctuated events (forest fires)	Traffic	Traffic, Wood Burning, Construction	Traffic, Construction	Traffic, construction, external sources (China)	Traffic, Construction, Industry, Forest Fires	Traffic, Wood Burning, Construction, Industrial emissions, Punctuated events (forest fires)

*The PSCAA and LFV administrative areas are dominated by uninhabited wilderness and therefore, are far greater than other regions and are largely unmonitored. Despite this, impacts to uninhabited regions, such as from anthropogenic LFV/PSCAA sources contributing $PM_{2.5}$, ozone, or acid deposition as well as impacts from these uninhabited regions (such as wildfires, forest cycling, vegetative isoprene emissions, etc.) can have increasing importance in both regions with potential increasing land use intensity changing the dynamic of these areas.

Recommendations

Since the most recent assessment of the Network in 2008, changes have occurred in air quality due to factors such as:

- increasing understanding of the impacts of traffic-related air pollution on the near road environment;
- more frequent transportation of wildfire smoke into the airshed;
- increasing impacts of climate change, e.g. on photochemical smog and wildfires;
- ambient air quality trends in MVRD and the FVRD;
- regional growth and emissions patterns; and
- evolving ambient monitoring technology.

In addition, the MVRD needs to ensure that the Network continues to be properly aligned with other federal and provincial commitments and networks.

A review of the recommendations that were provided in the 2008 Network assessment showed evidence that the MVRD has completed the majority of the recommendations and partially completed or planned to complete most of the remaining recommendations. RWDI has developed a new set of recommendations, which includes some of the previous recommendations that remain relevant, outlined below.

Improve Spatial Coverage of the Permanent Monitoring Network

In response to changes such as demographics and new insights, MVRD should consider additional permanent monitoring using tier 1 regulatory grade sensors, e.g. south of the Fraser River and in rural or wilderness areas.

This report has identified the air quality monitoring network operated by MVRD as a world-class network especially with respect to its permanent network using tier 1 regulatory grade sensors. With growing and shifting populations, changes in land-use, increasing consideration of indigenous communities, and growing scientific insights, MVRD should continuously evaluate its current network and respond to newly identified spatial gaps. The following areas have been identified for the potential addition of permanent stations:

- The area south of the Fraser River, in particular Surrey / White Rock; the City of Langley, the Walnut Grove sector of Langley and adjoining portion of northeast Surrey; and the northeastern portion of Abbotsford abutting onto Sumas Mountain.
- The portion of the FVRD covered by the Agricultural Land Reserve in eastern Abbotsford and eastern Chilliwack.
- Rural and wilderness areas.

Integrate Lower Tier Sensors into the Network

Based on recent advancements, it is recommended that MVRD expand the Network by incorporating tier 2 professional grade monitors and tier 3 consumer grade sensors.

Tier 2 professional grade instruments are capable of meeting air quality monitoring data quality objectives as specified within the Monitoring and Quality Assurance/Quality Control Guidelines published by the National Air Pollution Surveillance program or BC Ministry of Environment and Climate Change Strategy (BC MOECCS) field sampling manual. These instruments meet these data quality objectives but are not listed or use different monitoring technology to that listed in the guidelines

and have not undergone the rigorous testing required of regulatory grade instruments. Depending of the kind of system, there are several potential advantages:

- low power requirements and portability;
- few temperature restrictions for operation; and
- near instantaneous results and speciation of compounds such as volatile organic compounds and semi volatile organic compounds.

Tier 3 consumer grade instruments are low-cost instruments accessible to the general public but do not meet the requirements specified under the guidelines and are typically reported as having limited stability, susceptible to interference from other criteria air contaminants. These instruments are commonly deployed for so called “citizen science” and “community science”.

Citizen science typically operates mostly exclusive of scientific oversight; commonly, instructions are provided, and the citizen manages the system mostly with limited expertise and technical abilities. This enables the scientific organization to receive a large amount of sampling information while using very little resources, but the data could potentially have limited utility.

Conversely, a community approach engages a group of individuals (such as a school, hospital, or retirement community) to carry out measurements. Participants can be trained by the scientific organization more comprehensively on measurement protocol. In this case, less data is received, and more resources are required to support measurement training, but the data are of a higher quality and value.

MVRD might consider contacting the United States South Coast Air Quality Management District for additional information on its Air Quality Sensor Performance Evaluation Center (AQ-SPEC) and its approach to blending measurements and modelling. AQ-SPEC was created to facilitate the use of low-cost sensors through validation and data quality assessments. The research conducted by the AQ-SPEC provides a database of low-cost sensors that could help MVRD determine the most appropriate sensors that suit its needs beyond regulatory monitoring. However, it is important to note that environmental conditions specific to the LFV may require modifications of the use case.

Moreover, the South Coast Air Quality Management District blends observations at these non-regulatory monitoring locations with model output, including National Oceanic and Atmospheric Administration model predictions and mathematically simulated ‘stations’ as calculated by the South Coast Air Quality Management District. The district utilizes this data to create a gridded map of 5 km x 5 km cells to inform localized air quality, including an air quality index throughout the district. Historical, current, and forecast air quality data is provided to the public through smartphone applications and is also available on their website.

Improve Odour Monitoring

It is recommended that MVRD explores potential improvements in the effectiveness and efficiency of the current odour monitoring and management system.

MVRD’s current odour monitoring system relies mainly on complaints submitted by the public (3000 to 4500 complaints per year). MVRD receives more complaints relating to odour than any other type of air emission. Upon reception of a complaint, officers perform odour surveys starting at the complainant location based on wind direction and the most likely suspect. The current system requires substantial resources and appears to be too slow to be effective in identifying compliance issues.

MVRD might want to investigate possibilities to complement the current complaint-based system with an additional layer of less formal information on odours for surveillance purposes. The University of British Columbia, for example, has launched the Smell Vancouver public web application (https://smell-vancouver.ca/), where citizens can report odours for research purposes. Similarly, the Wood Buffalo Environmental Association's COMP (Community Odour Monitoring Program) allows community members to submit information about odours they experience in the Regional Municipality of Wood Buffalo. Information is submitted to a database, where it will be compared to the ambient air data collected at the Wood Buffalo Environmental Association's air monitoring stations throughout the region. If high odour concentrations are found to coincide with high concentrations of continuously monitored criteria air contaminants, a locally valid relationship can be developed and those already measured contaminants could be used as a proxy for odours.

By giving users the ability to choose between sending a notification or a formal complaint, more data can be collected over the long-term to develop a better understanding of potential odour sources, without the need to follow up and respond to notifications. It is plausible that users might choose to notify rather than complain when given an option. There might also be instances where some citizens find an odour offensive enough to issue a complaint while others might notice the odour but only send a notification.

Add Carbon Dioxide (CO_2) Measurements

Given the increasing importance of climate change, it is recommended that MVRD adds CO_2 monitoring to existing sites representing different environments such as urban, suburban, and rural. In addition, CO_2 measurements can be used to aid in determining emissions factors and to improve emissions inventory reports.

Concentrated emissions of CO_2 in a localized area can lead to a capping effect that locally increases concentrations of O_3 and PM, thereby increasing exposure to these contaminants in urban areas. It also creates stagnation conditions that can favour secondary pollution formation. Finally, over the longer term, CO_2 records might also provide information on the effectiveness of policy measures to reduce CO_2 emissions and of the impact of population shifts and associated land-use changes.

Audit Air Quality Monitoring Sites Annually

Auditing air quality monitoring sites every one to three years ensures that the sites continue to meet original siting criteria and that measurements are suitable for their original purpose, and it increases transparency. The audits should include a full site inspection.

This recommendation was carried forward and modified from recommendation 16 in the 2008 network review. Currently, MVRD conducts instrument performance and station operation audits, but not a full audit. For transparency, audit results could possibly be published in an appendix to the annual reports as part of the recommendation to expand documentation.

Expand Documentation

Providing additional network-related information improves transparency and supports research. Examples of additional information include:

- Standard operating procedures, quality assurance and quality control activities, and station and instrument audit procedures;
- Metadata; and
- Audit and calibration results.

Provide Air Quality Health Index (AQHI) for each Monitoring Station

Currently, the Lower Fraser Valley is covered by six AQHI zones, with the AQHI for each zone being reported on Metro Vancouver's website. Nineteen LFV monitoring sites measure all three of $PM_{2.5}$, O_3, and NO_2 and would allow for calculation of the AQHI in these specific locations, in addition to the AQHI zones currently being reported. It is recommended to add a $PM_{2.5}$ monitor to the Maple Ridge site to allow for a station-specific AQHI to be reported in that location.

Add Second Near-Road Site

Based on recent and projected population data for the MVRD, the addition of a second near-road site is recommended.

The current Network meets the recommended criteria for near-road sites namely: at least one site for the MVRD with a population greater than 1 million with the following parameters measured: black carbon, CO, NO_2, O_3, $PM_{2.5}$, SO_2, ultra-fine particles and traffic counting. However, in the last few years MVRD has surpassed a population greater than 2.5 million and is predicted to continue growing to more than 3.0 and 3.5 million people in the 2030's and 2040's, respectively. A second near-road site for a population greater than 2.5 million is recommended.

It might be helpful to deploy the mobile air monitoring unit at candidate locations before deciding on a fixed location. A main arterial road with nearby residences is desirable, ideally with a different traffic mix than Clark Drive, which has a very high percentage of heavy truck traffic.

In addition to serving local needs within MVRD, an additional near-road site would contribute to nation-wide objectives. In the 'Near-Road Air Pollution Pilot Study' in 2019, Southern Ontario Centre for Atmospheric Aerosol Research recommended a national near-road monitoring network including long-term near-road monitoring stations established in Canada's largest cities. The network should promote outreach and public involvement, to proactively engage Canadians, encourage behaviour change, and build stronger societal support for new policies or regulations. The network for near-road monitoring should publicly share data from near-road stations through web sites, phone apps, and public displays (e.g., electronic signs on highways) when and where impacts are potentially arising. Such a national initiative would also directly benefit MVRD.

Re-Establish Remote Monitoring Station

It is recommended that MVRD re-establishes a remotely located permanent station to monitor air quality, specifically criteria air contaminants, in the clean, background lower troposphere relevant to air quality in the LFV.

This recommendation was originally suggested in the 2008 network review and temporarily implemented from 2010-2017 by MVRD's partnership with ECCC and BC MOECCS in the operation of the baseline air quality station in Ucluelet. A detailed site selection study was originally performed, which might contain information that is still relevant to determine an alternative remote location. In the interim, it is RWDI's understanding that attempts are being made to establish statistical relationships for the available data period from 2010-2017 between data collected at Ucluelet and other regional stations such as Cheeka Peak on the Olympic Peninsular. That information could be helpful in filling in the data gap after establishing a new background station but would not be a substitute for a new background station, because there is high uncertainty in the extrapolation of such a statistical relationships into the future.

Expand Ancillary Information

It is recommended that MVRD considers providing additional air quality related information.

While this recommendation does not directly relate to the Network itself, desirable ancillary information to the Network was identified during the review in the larger context of air quality in the LFV. Specifically, MVRD could collaborate with respective agencies to provide information such as:

1. Traffic data in standardized and systematic formats for major roadways in the LFV.
2. Additional information for protection from air quality impacts of wildfires.
3. Emission Inventory: Additional ways of aggregating individual emission sources and source types.

These three examples are further explored in the following subsections.

Traffic Data

Traffic counts, fleet composition, and other traffic-related information are important determinants of population exposure to traffic-related air pollution. In addition, traffic data is of crucial importance in the development of emission inventories for photochemical modelling.

Traffic data are typically collected by municipalities in Canada but are difficult to obtain in standardized and systematic formats for large geographic areas. Potential partners with a shared interest in traffic data, and who might already be collecting traffic data, are Translink and the BC Ministry of Transportation and Infrastructure. A standardized approach to collecting traffic data, particularly truck data, would provide valuable information to extrapolate results from near-road measurement sites across areas impacted by traffic and support traffic models. There are also potential synergies with respect to the quantification of traffic related GHG emissions. By joining forces with other interested agencies, benefits could be maximized and cost shared between agencies.

Wildfires

MVRD's advisory program is already comprehensive and collaborative with partners in the Health Authorities for education/outreach. However, given the substantial impact of wildfires on air quality in the LFV in recent years, MVRD might be able to incorporate additional resources to improve public health protection.

Major forest fire events in recent years have caused substantial increases in summer $PM_{2.5}$ and possibly also NO_2 and ozone concentrations throughout the LFV. Current research on future forest fire extent and frequency might not be conclusive because of many driving factors, including forest management practices. However, increasing summer temperatures and a likely extension of the dry period in the Pacific Northwest are factors that will exacerbate favorable forest fire conditions. Furthermore, measures to decrease forest fire risk and improve fire management will take years to decades to implement and take effect. Recent research suggests that the health impacts of $PM_{2.5}$ originating from wildfires might be greater than from non-wildfire sources (Aguilera, 2021). To improve the protection of public health, MVRD might consider utilizing additional information and prediction resources such as resources from the US EPA (https://www.epa.gov/smoke-ready-toolbox-wildfires). Opportunities might also exist to share and coordinate resources and information with other agencies such as the BC Centre for Disease Control and HealthLinkBC.

Emission Inventory

Additional ways of aggregating individual emission sources and source types could provide additional insights and would benefit the tracking and forecasting of growth sectors such as the Port.

It was noted by MVRD that work is currently under way to create a GHG emission inventory for the LFV. With respect to CAC, individual emission sources or specific source types are aggregated in different ways in MVRD's emission inventories (MVRD, 2018a) to shed light on areas of particular concern that could be targeted with emission reduction policies. MVRD might want to consider additional aggregations, for example to describe Port areas and their supply chain emissions (e.g. truck and rail) together as a major source, along with growth projections.

Expand the Use of Speciation Data

The review identified several opportunities to utilize existing data better or add measurements of particular importance.

This review highlighted the wealth of information provided by the National Air Pollution Surveillance network in the LFV, especially for speciated data. While ongoing reductions in the speciation program might run counter to its utility, they could be reconciled with improvements to increase the Network's utility.

Currently, some of the LFV sites measure high levels of some volatile organic compound (VOC) species. Characterization of VOCs is important as some are air toxics with direct human health effects and others act as precursors to photochemical smog. Because the National Air Pollution Surveillance program applied consistent methodology over time, accurate trend determination can be made for total non-methane hydrocarbons and for individual VOC species. Moreover, speciated VOC measurements can be used to infer emission contributions and validate emission inventories. The expansion of the Trans Mountain Pipeline and associated storage facilities and marine traffic may result in increased VOC emissions and impacts.

Some semi-volatile species such as polycyclic aromatic hydrocarbon (PAH) are toxins of particular concern downwind of some point sources within the LFV as well as from residential wood burning. Therefore, MVRD should consider the measurement of semi-volatiles species at some select locations.

For $PM_{2.5}$, mass alone is a very imperfect measure of potential $PM_{2.5}$ impacts. Tracking progress and developing optimum control strategies for $PM_{2.5}$ requires a detailed understanding of precursor levels and components. Data on ambient levels of ammonia and nitric acid are important for a full understanding of the atmospheric chemistry and fate of emitted nitrogen oxides especially on a regional scale. The speciated $PM_{2.5}$ measurement program also collects data on biomarkers such as levoglucosan that are useful in quantifying forest fire impacts as well as residential wood burning. The relative importance of various species and emission sources on visibility can also be derived from the speciated $PM_{2.5}$ measurements being made at network sites.

Reduce Carbon Monoxide Monitoring

MVRD might consider further reductions in conventional carbon monoxide (CO) monitoring.

Current CO levels throughout the LFV and even at the sites most impacted by transportation sources are well below existing ambient air quality objectives by MVRD. There are no Canadian ambient air quality standards for CO, and it is not used in the calculation of the AQHI. In urban areas, CO measurements can provide an index of anthropogenic emissions and, when linked with NO_X and VOC measurements, can provide important information related to emissions verification and the efficiency of emissions controls, especially as they relate to the transportation sector. Microscale and middle scale measurements are the most useful site classifications for CO monitoring sites, because most people have the potential for highest exposure on these scales. Currently, even after reduction in CO monitoring, the majority (8 out of 12) of LFV sites remain neighbourhood scale and population exposure classification. High sensitivity measurements would be the most useful for all scales of representativeness.

Continue Performing Special Studies

It is recommended that MVRD continues performing special studies.

In the previous network review (RWDI, 2008), it was recommended to perform special studies to examine neighbourhood-scale variability of pollutants in an area of mixed land-use including residents and a variety of emission sources and to examine air quality near roadways in areas with residents and high traffic congestion. MVRD implemented these recommendations by performing or participating in several special studies. The value of these studies has been noted in this review and acknowledged by MVRD.

Conclusions

A comparison with other large air quality monitoring networks showed that the MVRD is operating a world-class network. A review of the Network objectives that were identified in the previous Network assessment in 2008 was not part of this assessment, but it is RWDI's impression that these objectives remain applicable and valuable. A review of the recommendations that were provided in the 2008 Network assessment showed evidence that the MVRD has completed the majority of the recommendations and partially completed or planned to complete most of the remaining recommendations. RWDI has developed new recommendations, including previous recommendations that remain relevant. All new recommendations are in support of the Network objectives from the 2008 assessment.