City of Richmond

REVISED
Agenda

Public Works and Transportation Committee
Electronic Meeting

Council Chambers, City Hall
6911 No. 3 Road

Thursday, February 23, 2023
4:00 p.m.

Pg. # ITEM

MINUTES

PWT- 4 ***Motion to adopt the minutes of the meeting of the Public Works and Transportation Committee held on January 25, 2023.***

NEXT COMMITTEE MEETING DATE

March 22, 2023, (tentative date) at 4:00 p.m. in the Council Chambers.

PLANNING AND DEVELOPMENT DIVISION

REVISED REPORT 1. **TRAFFIC AND PARKING MANAGEMENT PLANS - CONSTRUCTION PARKING REVIEW**
(File Ref. No. 02-0775-50-7237) (REDMS No. 7099264)

PWT-9 See Page **PWT-9** for full report

Designated Speaker: Sonali Hingorani

STAFF RECOMMENDATION

That the staff report titled "Traffic and Parking Management Plans – Construction Parking Review", dated January 24, 2023, from the Director. Transportation be received for information.

ENGINEERING AND PUBLIC WORKS DIVISION

2. **2023 LIQUID WASTE MANAGEMENT PLAN BIENNIAL REPORT**
(File Ref. No. 10-6060-03-01) (REDMS No. 7113213)

PWT-14

See Page **PWT-14** for full report

Designated Speaker: Eric Sparolin

STAFF RECOMMENDATION

The City's 2023 Liquid Waste Management Plan Biennial Report as presented in Attachment 1, dated January 25, 2023, from the Director, Engineering, be submitted to Metro Vancouver.

3. **UBCM COMMUNITY EMERGENCY PREPAREDNESS FUND: 2022/23 DISASTER RISK REDUCTION – CLIMATE ADAPTATION GRANT APPLICATION**
(File Ref. No. 10-6060-01) (REDMS No. 7109253)

PWT-59

See Page **PWT-59** for full report

Designated Speaker: Eric Sparolin

STAFF RECOMMENDATION

(1) That the application to the Community Emergency Preparedness Fund, Disaster Risk Reduction – Climate Adaptation funding stream as outlined in the staff report titled "UBCM Community Emergency Preparedness Fund: 2022/23 Disaster Risk Reduction – Climate Adaptation Grant Application" dated January 24, 2023 from the Director, Engineering be endorsed;

(2) That should the grant application be successful, the Chief Administrative Officer and the General Manager, Engineering and Public Works, be authorized on behalf of the City to negotiate and execute funding agreements with UBCM for the above mentioned projects; and

(3) That should the grant application be successful, capital projects of $150,000 for Seepage Assessment and Management Strategy, $150,000 for Flood Protection Monitoring Stations, and $2,000,000 for No. 3 Road Canal Improvements be approved with funding from external grant, as outlined in the staff report titled "UBCM Community Emergency Preparedness Fund: 2022/23 Disaster Risk Reduction – Climate Adaptation Grant Application" dated January 24, 2023 from the Director, Engineering, and that the Consolidated 5-Year Financial Plan (2023-2027) be amended accordingly.

4. **MANAGER'S REPORT**

ADJOURNMENT

City of Richmond

Minutes

Public Works and Transportation Committee

Date:	Monday, January 25, 2023
Place:	Council Chambers Richmond City Hall
Present:	Councillor Carol Day, Chair Councillor Michael Wolfe Councillor Chak Au Councillor Kash Heed Councillor Alexa Loo
Also Present:	Councillor Laura Gillanders Councillor Andy Hobbs Councillor Bill McNulty
Call to Order:	The Chair called the meeting to order at 4:00 p.m.

MINUTES

It was moved and seconded
That the minutes of the meeting of the Public Works and Transportation Committee held on December 21, 2022, be adopted as circulated.

CARRIED

PLANNING AND DEVELOPMENT DIVISION

1. **APPLICATION TO THE BLOOMBERG INITIATIVE FOR CYCLING INFRASTRUCTURE GRANT**
(File Ref. No. 03-1080-01) (REDMS No. 7102388)

It was moved and seconded

(1) That the submission for cost-sharing to the Bloomberg Initiative for Cycling Infrastructure Grant Program as described in the staff report titled "Application to The Bloomberg Initiative for Cycling Infrastructure Grant", dated January 9, 2023, from the Director, Transportation be endorsed;

(2) A letter of support from the City be included in the grant application;

(3) That, should the above application be successful, the Chief Administrative Officer and the General Manager, Planning and Development, be authorized on behalf of the City to execute the funding agreement; and

(4) That the Consolidated 5 Year Financial Plan (2023-2027) be amended accordingly.

CARRIED

2. **PROPOSED AMENDMENTS TO TRAFFIC BYLAW NO. 5870 TO REMOVE 60 KM/H SPEED ZONES**
(File Ref. No. 02-0775-50-7237) (REDMS No. 7065443)

In response to queries from Committee staff advised that (i) they would review and investigate speed limits at the No. 2 Road Bridge and take appropriate action to align the speed limit with the other roads in the City, (ii) radar camera enforcement is under Provincial government jurisdiction, (iii) the City of Richmond's traffic camera program is related to collecting data and video detection for traffic operations and data analytics purposes, (iv). one of the staff recommendations is to ask the Provincial government for additional automated enforcement on city roadways, (v) the reduction in engine brake bylaw violations may be due to technological improvements to engine brakes that reduce the amount of noise emitted, (vi) signage is posted at all intersections that have cameras, (vii) recommendations of the staff report are to have a 50 k/hr maximum speed limit throughout Richmond, and (viii) staff will work with RCMP to coordinate enforcement of the speed limit.

It was moved and seconded

(1) That Traffic Bylaw No. 5870, Amendment Bylaw No. 10434, as described in the staff report titled "Proposed Amendments to Traffic Bylaw No. 5870 to Remove 60 km/h Speed Zones", be given first, second and third readings; and

(2) A letter be sent to the Province of British Columbia to implement additional automated speed enforcement programs in Richmond.

CARRIED

3. **AMENDMENTS TO THE RECYCLING REGULATION AND RECYCLE BC PROGRAM**
(File Ref. No. 10-6370-01) (REDMS No. 7088640)

In response to queries from Committee staff advised that (i) the majority of digital assets have been updated, and staff are working on updating the recycling depot signage, (ii) they will communicate changes to the Recycle BC Program to the school district, (iii) they are undertaking a commercial services review and will be addressing issues such as recycling of coffee cups at fast food restaurants, (iv) Federal government regulations restrict food serviceware that contains black carbon, (v) flexible plastic is sent to a local facility for recycling, staff will provide Council with a memorandum on what the flexible plastic is recycled as, (vi) staff will follow up in a year with businesses regarding the new reusable plastic bags currently being used, and (vii) staff will investigate if plastic plant pots can be reused by nurseries.

It was moved and seconded
That the expanded scope of items to be accepted in the City's recycling programs, as outlined in Attachment 1 of the staff report dated December 19, 2022, titled "Amendments to the Recycling Regulation and Recycle BC Program, from the Director Public Works Operations, be endorsed.

CARRIED

4. **SINGLE-USE PLASTIC AND OTHER ITEMS BYLAW 10000 – IMPLEMENTATION UPDATE**
(File Ref. No. 10-6370-01) (REDMS No. 7088633)

Staff noted that as of January 25, 2023, non compliance bylaw complaints have been received against 19 businesses and that enforcement is being led through education for businesses.

It was moved and seconded
That the staff report dated December 21, 2022, titled "Single-Use Plastic and Other Items Bylaw 10000 – Implementation Update", from the Director, Public Works Operations, be received for information.

CARRIED

5. **PROGRESS UPDATE ON BUILDING BENCHMARK BC PROGRAM**
(File Ref. No. 10-6125-07-02) (REDMS No. 7087345)

Staff highlighted that Building Benchmark BC is a program that started in 2019 and to date has 20 local governments as participants. Benchmarking is a process of reporting annual energy and emissions in buildings and reporting that on a common platform used by others and having the option to disclose publically those results.

In response to queries from Committee staff advised that (i) staff hope to have the two new temporary full time staff positions posted in the first half of 2023, (ii) 33 civic City buildings were benchmarking and reporting their results through the Building Benchmark BC program in 2022, (iii) findings show a 7-14 percent improvement in reduction of energy use and emissions over a two-four year period depending on the study, and (v) this program through it's tracking system is an important tool in improving energy efficiency and decarbonizing buildings and analyzing year to year trends to plan accordingly.

Discussion ensued regarding how to promote greater awareness of the program in the private sector and writing a letter to the Provincial government to request assistance to promote the Building Benchmark BC program. As a result of the discussion the following **referral** motion was introduced:

It was moved and seconded

(1) That a letter be sent to the Provincial government to request assistance to promote the Building Benchmark BC Program; and

(2) That staff examine options to increase awareness of the Building Benchmark BC Program to appropriate building owners and occupiers and report back.

CARRIED

It was moved and seconded

That the report titled "Progress Update on Building Benchmark BC Program" from the Director Sustainability and District Energy, dated December 20, 2022 be received for information.

CARRIED

6. MANAGER'S REPORT

(i) Intersection Traffic Camera Program

Staff advised that new cameras have been installed at the intersection of No. 5 Road and Westminster Hwy, which brings the total of intersections with cameras to 138.

ADJOURNMENT

It was moved and seconded

That the meeting adjourn (4:59 p.m.).

CARRIED

Certified a true and correct copy of the Minutes of the meeting of the Public Works and Transportation Committee of the Council of the City of Richmond held on Monday, January 25, 2023.

Councillor Carol Day
Chair

Raman Grewal
Legislative Services Associate

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 24, 2023
From:	Lloyd Bie, P.Eng. Director, Transportation	**File:**	02-0775-50-7237/Vol 01
Re:	**Traffic and Parking Management Plans - Construction Parking Review**		

Staff Recommendation

That the staff report titled "Traffic and Parking Management Plans – Construction Parking Review", dated January 24, 2023, from the Director, Transportation be received for information.

Lloyd Bie, P.Eng.
Director, Transportation
(604-276-4131)

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Engineering	☑	
Community Bylaws	☑	
Development Applications	☑	
Building Approvals	☑	
Law	☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:**	**APPROVED BY CAO**

7099264

Staff Report

Origin

At the Planning Committee of April 20, 2022, staff were given the following referral:

That staff review the feasibility of implementing and requiring a bond for builders and developers to maintain construction parking and management plans for single and multiple construction sites in a manner that respects the community and neighbourhood properties.

This report presents staff's findings in response to the referral.

This report supports Council's Strategic Plan 2018-2022 Strategy #1 A Safe and Resilient City:

1.1 Enhance safety services and strategies to meet community needs.

This report supports Council's Strategic Plan 2018-2022 Strategy #4 An Active and Thriving Richmond:

4.2 Ensure infrastructure meets changing community needs, current trends and best practices

Analysis

Existing Construction Parking Requirements

The submission and approval of a construction traffic and parking management plan (TMP) is a requirement before a building permit can be issued for most development projects. Smaller residential developments of less than four units that front a minor street are exempt from a TMP.

Approval of a TMP is conditional to the provision of construction vehicle parking being accommodated onsite to minimize use of public roads. Where site constraints prevent such areas from being established, a contractor is to make arrangements for parking and transport of employees to the site from an offsite location.

Should parking related concerns due to construction activity arise, staff contact the contractor to remedy the situation and this process has been effective at addressing isolated issues. Enforcement is another tool in managing street parking concerns, however, it is resource intensive and requires time to administer. Traffic Bylaw 5870 currently limits the amount of time a vehicle can park in front of a residential home should the vehicle not belong to a resident or visitor:

No person shall park a vehicle between the hours of 8:00 a.m. and 6:00 p.m., on any highway abutting any premises used for residential or commercial purposes for more than 3 hours unless such premises are the property or residence of such person or the property of his employer.

The typical process in responding to a potential infraction of the bylaw involves several steps. Firstly, input from residents regarding an unrelated vehicle parking in front of their property is required. A parking enforcement officer then needs to attend the site and mark the vehicle to commence the three hour parking limit. Once the allotted time elapses, another visit to the vehicle to confirm the infraction is necessary. After submitting the complaint to the City, this procedure may not meet the expectation of some residents in resolving the parking issue in front of their property in a timely manner. Further, given the geographical and population size of the City, Staff must deploy parking enforcement resources strategically and prioritize: scheduled patrols targeting high volume traffic/commerce areas; seasonal and event specific traffic hotspots, which are derived through analytics; and on the basis of call response to public complaints.

With the recent number of redevelopment projects under construction in the Spires Road neighborhood, concerns about the impact of construction related vehicles in single family residential areas has been raised. Staff explored options through the TMP process, to streamline enforcement and improve parking management near construction sites in these areas.

Options To Address Construction Parking Concerns

Option 1: Status Quo

Staff's experience is that most construction sites are in compliance with the approved TMP and instances of construction related vehicles parking on adjacent streets are not an on-going issue. This option would maintain the current process to notify the contractor and/or Community Bylaws officers to target specific concerns should they arise. If a contractor consistently deviates from the approved TMP, staff do ultimately have the ability to invoke a stop work order should other measures prove ineffective. Staff will continue to require TMPs to include provisions for construction related vehicles onsite or at a designated offsite location, to ensure the impact to the public road is minimized.

Option 2 – Fines for TMP Infractions

Under the City's Bylaws, fines for parking infractions are charged to the owner of the offending vehicle. The City does not currently have a system of fines for infractions against a TMP that are levied against a contractor or developer. Should the City wish to provide a direct financial incentive to a developer or contractor to operate within their TMP, a system of fines can be developed at Council's direction. To be effective, the fines would need to be substantial, otherwise they could become "the cost of doing business", particularly where the proximity of the street parking has value to the contractor or developer.

This option does not solve the underlying enforcement issues and is unlikely on its own to reduce complaints from properties adjacent to construction sites. The offending vehicle would still need to be reported by a resident and the parking enforcement officer would still be required to observe the offending vehicle for three hours before a ticket can be given. There would be an additional complexity of proving the offending vehicle is associated with a construction site so that a fine could be levied against that construction site, particularly in an area with more than

one construction site or homes performing renovations. This option would require changes to the Bylaw that would include identifying offences and fines for those offenses as well as City staff that can determine if an offence has been committed.

Staff does not support this option, given that invoking a stop work order for violation of the TMP is viewed as being a more effective tool. If Council wishes to pursue this option, Staff can develop a potential process and Bylaw changes that identify the fines for TMP violations and recommend staff that would be responsible for levying these fines for Council's consideration.

Option 3 – TMP Bond:

This option would collect a security deposit as part of the TMP to be held until completion of construction. Should any deviations from the approved TMP occur with respect to construction parking, funds would be withheld by the City.

Section 12 of the Community Charter governs the type of security that can be collected by the City and some conditions for their use. Security deposits are best utilized to recover costs where the City is required to perform work where a contractor or developer has responsibility for that work. An example of this is recovery of costs where the City repairs a roadway damaged by a contractor or developer that did not perform the repair in a timely manner. Given that securities are primarily a tool for cost recovery, they are not easily used to insure payment of fines.

Similar to Option 2, this option does not address the underlying enforcement challenges that are creating public complaints, would require development of a scale of TMP offences and fines, challenges with proving the offending vehicle is associated with a particular construction site, and empowerment of specific staff to levy fines against a specific construction site.

Staff does not support this option as it creates legal and operational complexity without solving the underlying enforcement issues. Should Council wish to explore this option further, Staff can develop Bylaw changes required, including staff that would be in authority to draw on the security, and report back to Council at a later date.

Option 4 – Temporary Resident Permit Parking Pilot:

Residential permit parking zones are typically created on local neighbourhood streets where there is a high demand for parking by non-residents. A similar short term program could be considered on a trial basis for single family neighborhoods experiencing increased street parking demand due to adjacent construction activities.

This option would require a contractor to include a temporary resident only permit parking program as part of the TMP. Additional effort by the contractor to receive approval of their TMP would be a result of this option and the contractor would need to inform nearby residents of this program. Implementation of this option would include installation of permit parking only signs within an estimated 200 metres of the construction zone. Residents could register their vehicle license plate with the City to be exempt from the "no parking" restriction. Construction vehicles would not be permitted to register for this program.

The advantage of this option is that it facilitates proactive enforcement. The licence plate registration allows staff to more efficiently and effectively determine if a vehicle is permitted to park on the street within the established "no parking" zone. This would prioritize street parking for residents only, however, visitors of residents would need to be accommodated off-street. The City's license plate recognition vehicle would proactively patrol the neighborhood to determine if the vehicle has a permit and enforce accordingly.

Costs of signage and administration of this program would be borne by the contractor. To cover the anticipated staff costs for this program, a fee of $100.00 per year for each single family home identified, would need to be collected as part of the TMP approval. This fee is based on review of similar permit fees in other municipalities and in consideration of the temporary nature of this program. A trial of this option for one year would provide cost data that could be used to develop formal criteria and fees for a more permanent program. During the trial period, staff could monitor the effectiveness of this option at addressing neighbourhood parking concerns created by construction traffic and seek feedback from residents and the construction industry.

Summary

In general, the status quo process of requiring a TMP that includes on site parking provisions works well in combination with direct communication with contractors and parking enforcement officers. Where regular enforcement and communication have not worked, stop work orders have been effective at bringing contractors into compliance with their parking plan.

A significant issue in residential parking enforcement is identification of offending vehicles, as parking enforcement officers cannot determine which vehicles are permitted to park on a street without input from residents. The only option that improves this underlying issue is Option 4, which catalogues which vehicles belong to residents and are permitted to park on the street. Permit parking combined with the City's license plate recognition vehicle could be effective at meeting the expectation of residents adjacent to construction sites.

Options to develop fines for TMP violations and take a security bond to secure payment of fines were explored, but staff believe they would add significant complexity, be difficult to enforce and are unlikely to substantially impact TMP compliance.

Financial Impact

None.

Conclusion

Appropriate management of street parking resources is important for adjacent residents and businesses. The current review and approval process of construction parking management plans limits the construction site footprint on public roads. Existing measures to manage parking concerns by working directly with contractors and liaising with Community Bylaws Department to target enforcement is generally addressing issues as they arise. Ultimately, stop work orders have been effective at bringing contractors and developers into compliance when other options are exhausted. Should Council wish to improve upon the status quo, staff have provided options in this report for Council's information.

Staff will continue to monitor any complaints received regarding construction related activities in single family neighbourhoods. Should current practices become insufficient to manage construction related vehicle impacts, staff will bring forward recommendations to Council for consideration.

Sonali Hingorani, P.Eng.
Manager, Transportation Planning and New Mobility
(604-276-4049)

SH:cas

City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 25, 2023
From:	Milton Chan, P.Eng. Director, Engineering	**File:**	10-6060-03-01/2023-Vol 01
Re:	**2023 Liquid Waste Management Plan Biennial Report**		

Staff Recommendation

The City's 2023 Liquid Waste Management Plan Biennial Report as presented in Attachment 1, dated January 25, 2023, from the Director, Engineering, be submitted to Metro Vancouver.

Milton Chan, P.Eng.
Director, Engineering
(604-276-4377)

Att. 1

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Public Works	☑	
Sustainability & District Energy	☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:**	**APPROVED BY CAO**

Staff Report

Origin

The Greater Vancouver Sewerage and Drainage District (GVS&DD) Board adopted the Integrated Liquid Waste and Resource Management Plan (the "Liquid Waste Plan") in May 2010. Subsequently, at the September 27, 2010 City of Richmond Regular Council Meeting, Council adopted the following motion:

> *"That the municipal commitments in the Metro Vancouver 2010 Integrated Liquid Waste and Resource Management Plan be endorsed."*

The Minister of Environment approved the Liquid Waste Plan, subject to conditions identified in his letter dated May 30, 2011.

The Liquid Waste Plan requires member municipalities to report progress on 27 municipal commitments on a biennial basis. The Liquid Waste Plan Biennial Report will be compiled by Metro Vancouver and submitted to the Ministry of Environment once it is approved by the GVS&DD Board.

Metro Vancouver is currently updating the Liquid Waste Plan, and anticipates that the update be completed in 2023. As the updated Liquid Waste Plan is not available, Metro Vancouver and member municipalities continue to be required to submit the 2023 Liquid Waste Management Plan Biennial Report (the "2023 Biennial Report") in accordance with the Liquid Waste Plan adopted in 2010. It is anticipated that the next report would be prepared based on the updated Liquid Waste Plan. Staff will also update Council on updates proposed by Council in the 2023 Liquid Waste Plan and Drinking Water Management Plan.

This staff report summarizes the City's progress on the Liquid Waste Plan municipal actions, and presents the 2023 Biennial Report (Attachment 1) for Council's endorsement for submission to Metro Vancouver for incorporation into the Liquid Waste Plan Biennial Report.

This report supports Council's Strategic Plan 2018-2022 Strategy #1 A Safe and Resilient City:

> *1.2 Future-proof and maintain city infrastructure to keep the community safe.*

This report supports Council's Strategic Plan 2018-2022 Strategy #2 A Sustainable and Environmentally Conscious City:

> *2.2 Policies and practices support Richmond's sustainability goals.*

This report supports Council's Strategic Plan 2018-2022 Strategy #5 Sound Financial Management:

> *5.4 Work cooperatively and respectfully with all levels of government and stakeholders while advocating for the best interests of Richmond.*

Analysis

The Liquid Waste Plan includes a municipal commitment to report progress on a biennial basis. The 2023 Biennial Report covers the 2021 to 2022 reporting period. Richmond has previously submitted nine (9) biennial reports over the last 20 years based on reporting requirements in the current and previous Liquid Waste Management Plans.

The 2023 Biennial Report includes 27 narratives, several tables, and graphics attachments that report on the 27 municipal commitments included in the Liquid Waste Plan. The following are highlights of Richmond's 2023 Biennial Report:

Stormwater Management Plan

Liquid Waste Plan action 3.4.7 requires municipalities to develop and implement stormwater management plans that integrate with land use. Richmond has developed an Integrated Rainwater Resource Management Strategy, a strategic approach to manage stormwater within the City's floodplain ecosystem. It identifies strategies to detain stormwater, improve water quality, control sediments, harvest and re-use rainwater, as well as protect and enhance green infrastructure. In addition, Richmond's Ecological Network Management Strategy contains actions and initiatives on the integration of rainwater Best Management Practices tailored to various land uses within the City.

Key actions in this reporting period related to stormwater management include the following:

- Continued the Council-endorsed Mitchell Island Environmental Stewardship Initiatives program implemented during the last reporting period (2019-2020), and as part of this initiative:
    - Retained a consultant to commission a study to identify green infrastructure solutions to improve stormwater quality on Mitchell Island prior to discharge into the Fraser River;
    - Developed an informational handout for industrial businesses on Mitchell Island, informing them on how to effectively report environmental issues to the applicable response agency; and
- Managed, with funding from the BC Ministry of Forests, infestation of Brazilian elodea (Egeria densa) using novel control methods such as diver-assisted suction dredging and water level manipulation. Staff are still monitoring but to date there has been no re-occurence
- Participated in regional Spill Response training and planning exercises, as well as provided training to internal staff to ensure that the City was able to effectively identify and respond to spills to the environment; and
- Stormwater monitoring program – in 2022, stormwater samples were collected at nine pump stations. Analysis of these sample for specified water quality parameters is underway and will be available mid-2023.

Liquid Waste Source Control

Grease Reduction and Green Cart Programs

The City maintains a Grease Management Program which includes grease source control, sanitary sewer system monitoring and inspection, and on-going maintenance work. A full-time bylaw enforcement officer is dedicated towards liquid waste source control and grease management for the food services sector. This officer continued to work successfully with representatives from Metro Vancouver, stakeholder groups, industry associations, pumping operators, and grease trap vendors to mitigate the impact of fats, oils and grease on the region's sanitary sewer system.

Richmond has had a Green Cart Program since 2013. The Green Cart Program reduces the amount of waste and pollutants such as grease that would otherwise be discharged into the sanitary sewer, and collected approximately 45,000 tonnes of food scraps and yard trimmings. To facilitate grease reduction in the sanitary system, Richmond conducts the following activities:

- Provide residents with Green Cart Program information in brochures, guides, and annual reports, as well as on City website and social media.
- Promote proper disposal of cooking oil and grease, and discourage the use of garburators through community outreach.
- Encourage drop-off options for oil and grease at the Recycling Depot.
- Launched a Multi-Family Grease Collection Pilot Program in 2022 to collect grease from 934 residential units in 6 buildings, and to assess impacts of grease reduction on the sanitary sewer system.

Water Metering

Ministerial Condition 2 for approval of the Liquid Waste Plan strongly encourages municipalities to create business cases and/or implement residential water metering programs, and to consider municipal rebate programs for water-efficient fixtures and appliances to reduce water use. Water metering is one of the most effective means of water conservation, and reducing water results in corresponding reductions in liquid waste generated.

The City is a regional leader in water metering, and has a comprehensive water meter program for both residential and commercial properties. All single-family, industrial, commercial, institutional, and farm properties in Richmond have been metered. The City initiated a volunteer water metering program for multi-family units in 2013. Resulting from this volunteer program, about 56% of the multi-family units in Richmond have been metered for water, and approximately 98% of metered multi-family complexes have saved money compared to the flat rate as of the end of 2022. In the 2021 to 2022 reporting period, Richmond installed 26 water meters at 15 multi-family complexes. In 2022, the City began implementation of mandatory water metering for multi-family complexes mandatory to further promote water conservation in these buildings.

Water metering provides customers increased rate equity compared to the flat rate and a tool to manage their costs, while consumption monitoring allows staff to identify leaks and system inefficiencies to minimize wastage. Since 2003, the City has managed to reduce total water consumption despite an overall 26% population increase. This is a strong indication that water metering efforts to date are having a positive impact on water conservation and minimizing the need for costly infrastructure upgrades by managing increases in demands.

To further promote reduced water use, the City provides metered customers with water conservation kits, which include low-flow showerheads, faucet aerators, toilet fill cycle diverters, toilet leak detection tablets, and educational water conservation tools. In addition, the City has successful programs for toilet rebates and rain barrels, and partnered with BC Hydro between 2014 and 2020 to provide residents with clothes washer rebates.

As of the end of 2022, program totals of 10,853 toilet rebates, 2,296 rain barrels, and 1,369 clothes washer rebates have been issued to Richmond residents.

Asset Management Plan

Liquid Waste Plan action 3.1.8 requires municipalities to develop and implement asset management plans, and to provide copies of those plans to Metro Vancouver by 2014. Richmond maintains both an Ageing Utilities Infrastructure Management Plan and a Growth Related Infrastructure Management Plan that are reviewed and updated regularly. Both of these have been in place for a number of years, and were completed ahead of Metro Vancouver's target date.

Richmond updated the Ageing Utilities Infrastructure Management Plan in 2022. The updated plan outlines the current and long-term financial requirements for maintaining and replacing City's ageing infrastructure. The City also updated the sanitary and drainage models in 2021 and 2022, respectively, to help guide planning and development for sewer and flood protection upgrades, replacement, and rehabilitation works. Updates to Metro Vancouver's Liquid Waste Plan will likely include increased emphasis on the effects of climate change on the liquid waste management system. Richmond is pro-active in addressing climate change demands, and are actively upgrading asset management plans and infrastructure to prepare for climate change.

Inflow and Infiltration

Inflow and infiltration of stormwater into the sanitary sewer system are typically caused by cross-connections or defects in the infrastructure, and place additional demands on the sanitary system. Liquid Waste Plan action 1.1.18 requires municipalities to develop and implement inflow and infiltration management plans that ensure inflow and infiltration levels are within Metro Vancouver allowances. Richmond does not have combined sewers, and does not permit unregulated groundwater discharge into the sanitary sewer system. The City continues to manage inflow and infiltration by addressing defects through its sanitary sewer assessment and rehabilitation program.

Metro Vancouver targets a 20-year cycle for inspection of regional sanitary sewers. Richmond commenced CCTV inspections of its gravity sanitary sewers in 2002 and completed the first cycle in 2015, seven years ahead of Metro Vancouver's target. Richmond started the next cycle

of sanitary sewer CCTV inspections in 2016. In the 2021 to 2022 reporting period, Richmond inspected 30,865 m of sanitary sewers, leading to a total of 72,376 m sanitary sewer that have been inspected since the start of the new cycle.

Rehabilitation of damaged mains identified through inspections is brought forward through the annual capital program. Included as part of the approved 2023 capital program, staff have been proactively planning for the next cycle of inspection and rehabilitation work, positioning the City to continue meeting or exceeding Metro Vancouver targets.

Staff continue to monitor inflow and infiltration levels at the City's sanitary pump stations, identifying any catchments that may have higher inflow and infiltration rates for subsequent study and remediation if required.

Financial Impact

None.

Conclusion

The 2010 Liquid Waste Plan includes a municipal commitment to report progress on Liquid Waste Plan actions on a biennial basis. The attached 2023 Biennial Report summarizes Richmond's progress on municipal actions for the 2021 to 2022 reporting period. In summary, over the 2021 to 2022 reporting period, the City's sanitary and drainage infrastructure has been in good condition and performing well, thus providing effective protection to our environment, and enabling the City to meet the requirements in the Liquid Waste Plan. Staff will continue to work on municipal actions identified in the Liquid Waste Plan to ensure that the City of Richmond continues to meet all of the requirements.

Eric Sparolin, P.Eng.
Manager, Engineering Planning
(604-247-4915)

Keith Lam, P.Eng.
Project Manager, Engineering Planning
(604-204-8516)

ES:kl

Att. 1: City of Richmond 2023 Liquid Waste Management Plan Biennial Report

2023 Liquid Waste Management Plan Biennial Report

Reporting Period: 2021 – 2022

Municipal Submission Section

To be completed by: March 1, 2023

Questions and submittal through Metro Vancouver at
2023biennialreport@metrovancouver.org

Municipal Contact Information			
Name	**Email**	**Phone**	**Responsible For ILWMP Action #**
Eric Sparolin	ESparolin@richmond.ca	604-247-4915	All except those listed below
Keith Lam	KLam2@richmond.ca	604-204-8516	
Peter Russell	PRussell2@Richmond.ca	(604) 276-4130	1.1.16, 1.1.17, 1.1.21, 1.3.17, 3.3.6, 3.4.7 Ministerial Conditions (7,9)

List of Content

Submission Checklist

Narratives:

☐ Narrative 1: *Summarize ongoing permitting & inspection programs*

☒ Narrative 2: *Summarize approach to regulating pesticides and lawn care products*

☒ Narrative 3: *Summarize updates to outreach plans for supporting liquid waste source control programs (e.g. stormwater, sewer use, sewer maintenance, I&I management, cross connections etc.) during the reporting period*

☒ Narrative 4: *Summarize I&I management plans & list key actions resulting from plans*

☒ Narrative 5: *Summarize enforcement enhancements and process efforts during reporting period*

☒ Narrative 6: *Highlight and summarize bylaw changes relating to stormwater management*

☒ Narrative 7: *Highlight and summarize changes to utility design standards and neighbourhood design guidelines in relation to on-site rainwater management*

☒ Narrative 8: *Summarize development of municipal sanitary overflow management plans. Highlight specific examples.*

☐ Narrative 9: *Highlight & summarize progress on the prevention of CSOs and the separation of combined sewers*

☒ Narrative 10: *List approaches and strategies that address risks (ie: regular maintenance, SCADA, monitoring, protocols, identified redundancies/contingencies)*

☒ Narrative 11: *Describe regulations and status of applications*

☒ Narrative 12: *Summarize existing municipal odour control programs and the implementation of new programs for targeted municipal sewer facilities*

☒ Narrative 13: *Summarize air emissions management programs for standby power generators at municipal sewer pump stations*

☒ Narrative 14: *Summarize air emissions management programs for standby power generators at municipal sewer pump stations.*

☒ Narrative 15: *Summarize key progress on the assessment and condition of municipal sewerage system*

☒ Narrative 16: *Summarize key progress or accomplishments on the development of asset management plans for municipal sewerage infrastructure*

☒ Narrative 17: *Summarize key findings from the tri-annual internal audit*

☒ Narrative 18: *Summarize the estimate of greenhouse gas emissions and odours associated with the operation of municipal and regional liquid waste management systems*

☒ Narrative 19: *Summarize and highlight any important details and action plans relating to wet weather SSOs & probably causes of CSOs*

☒ Narrative 20: *Summarize and highlight any changes to the existing municipal sewer flow & sewer level monitoring network*

☒ Narrative 21: *Summarize progress on the development of emergency management strategies and response plans for municipal & regional wastewater collection and treatment systems*

☒ Narrative 22: *Summarize key initiatives that support the adaptation of infrastructure & operations to address risks and long term needs*

☒ Narrative 23: *Summarize and highlight key initiatives relating to the development and implementation of the integrated management plans*

☒ Narrative 24: *Discuss water metering & rebate programs relating to water fixtures and appliances*

☒ Narrative 25: *Summarize whether any new municipal water metering policies or programs were introduced in the last report that address this action. If no changes, then indicate, "Same as the 2019-2020 reporting period: no changes".*

☒ Narrative 26: *Quote relevant OCP sections addressing stormwater, stream health and their consideration of ISMPs*

Tables:

Graphics & GIS Data:

☒ Attachment 1:

- I&I Mapping showing I&I rates for neighbourhoods where studies have been completed with before and after I&I (L/ha·d). Objectives to Illustrates catchment areas covered by I&I studies.
- Transmit an electronic copy of GIS shape files for study catchment boundaries to Metro Vancouver

☐ Attachment 2:

- Mapping showing where sewer separation work occurred in 2021-2022
- GIS shape files of the locations where sewer separation occurred in 2021-2022 for composite mapping
- GIS shape files of catchments of remaining combined sewer catchments as of December 31, 2022 (if separated catchments discharge to combined sewers, code the separated catchments as "separated").

☒ Attachment 3:

- Map and GIS data showing location of emergency municipal overflows (this information should have already been provided through a separate request through the REAC LWSC as well as the last reporting period. If already provided, please indicated so.

☒ Attachment 4:

- 2021-2022 map showing odour control facilities & locations of complaints (different than facility)
- GIS shape files for the odour facility and complaint mapping to allow for development of composite mapping

☒ Attachment 5:

- A map showing sewerage system CCTV inspection for 2021-2022 and the other areas of CCTV inspection work in a different colour over the previous 22 years (2000-2022).
- A map showing any sewer replacement /rehabilitation work for 2021-2022 as part of either asset management or capacity upgrades. Indicate whether the work is for upgrades or maintenance.

☒ Attachment 6:

- Titles of any completed asset [replacement] management plans (author, date, title, and publisher) for 2021-2022.
- Completed annual PSAP 3150 reporting on asset values for 2021-2022.
- Colour coded map showing age of the sewerage system (i.e.: <1900, 1901-1925, 1926-1950, 1951-1975, 1976-2000, >2001) updated to show any changes made in 2021-2022. If no changes, please indicate so and the mapping prepared for the 2019-2020 reporting period can be used.

☐ Attachment 7:

- Provide (if not already provided) GIS shape files which have the locations of the CSO outfalls for purposes of summary mapping (should already be reported under WSER).
- Provide GIS shape files or coordinates for the locations of wet & dry weather SSOs for each year (indicate which is dry/wet and year). Include SSO dates and estimated volume

☒ Attachment 8:

- Map and GIS coordinates showing locations of active municipal sewer flow/level monitors for the reporting period 2021-2022 (indicate whether permanent or temporary)

☐ Attachment 9:

- If not already provided, provide updated GIS shape files of the municipal sanitary sewer network, including manholes, pump stations, pipe diameters for the municipal sewer system as of the end of 2022. Please indicate what changes have been made for 2021-2022.

☒ Attachment 10:

- GIS shape files showing the ISMP boundaries and their status: Development Phase= Yellow; Implementation Phase = Light Green; Completed Phase = Dark Green. Add ISMPs still to start development as outlined only).

☐ Attachment 11:

- If initiated, results per watershed (as per ISMP Adaptive Management Framework)
- If undertaken, a map plus GIS shape files/coordinates showing location of monitoring.

☐ Attachment 12:

- Map showing any 2021-2022 changes to protected riparian areas & possible stream classifications. If no changes, then this figure is not required.

City of Richmond

Action 1.1.14 – Review and enhance sewer use bylaws to reduce liquid waste at source, including contaminants identified by the *Canadian Environmental Protection Act (2012).*

Table 1 Core Sewer Use Bylaws

Sewer Use Bylaws*	2021-2022 Changes**
Flood Protection – Bylaw No. 10426	Separated from and replace combined Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551
Sanitary Sewer – Bylaw No. 10427	Separated from and replace combined Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551
Public Health Protection Bylaw No. 6989	No changes
Pollution Prevention and Clean-Up Bylaw No. 8475	No changes

**Re-list existing core sewer use bylaws and list all new bylaws*

***Summarize any changes (if no changes, enter "No changes")*

Table 2 Summarize Status of Bylaws Related to Controlling Sediment Transport & Erosion

Name of Bylaw* (related to controlling sediment release from land clearing and construction phase of development)
Flood Protection Bylaw No. 10426 and Sanitary Sewer Bylaw No. 10427 (formerly Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551) – require that connections to the City's drainage and sanitary system be disconnected and capped prior to demolition of buildings to prevent sediments from entering City systems. ***Pollution Prevention and Clean-Up Bylaw No. 8475*** – prohibits the release of polluting substance into the receiving environment, and requires that no discharge from dewatering may enter the City's drainage system or watercourse without a Permit with the City. Such Permits require a Qualified Environmental Professional (QEP) to provide a Water Quality Monitoring Response Plan, as well as a signed and sealed QEP declaration confirming that the discharge water will meet minimum standards of the City, and will not cause harm to the receiving water body. ***Boulevard and Roadway Protection and Regulation Bylaw No. 6366*** – requires that anyone using a boulevard for construction ensure that the roadway is cleared of sediment-producing material during the activity. ***Boulevard Maintenance Bylaw No. 7174*** – requires that a property owner not discard any materials fronting their property. ***Watercourse Protection and Crossing Bylaw No. 8441*** – limits the obstruction of flow, and requires that watercourse crossing design, construction and maintenance are approved by the City so as to protect water quality and functioning of the City's drainage system or any City land. ***City of Richmond Engineering Design Specifications*** – requires that catch basins and inspection chambers be installed on all drainage service pipes to prevent sediments from discharging into the City's drainage system. It also requires that a Sediment Control Plan be submitted to the City to identify the type and location of sediment control best management practices that will be used during construction.

Bylaw Details	2021-2022 Changes*
Summarize monitoring requirements	In 2022, an additional fee was created under ***Watercourse Protection and Crossing Bylaw No. 8441*** allowing for more comprehensive environmental review
How data is assessed under the bylaw?	No changes
How is assessment used to initiate corrective actions?	No changes
Summarize approaches used to maintain compliance with the bylaw (e.g. annual resources dedicated to maintaining compliance).	No changes
Discuss effectiveness of bylaw/bylaws and current approach to prevent inputs of sediment to the storm system and receiving environment.	No changes

**For new or changed bylaws since 2019-2020, summarize any changes in 2021-2022 (if no changes in a section, enter "No changes").*

Action 1.1.15* – Continue existing programs of permitting and inspection to support and enforce sewer use bylaws (*Ongoing, *City of Vancouver Only*).

Narrative 1: Summarize ongoing permitting & inspection programs

Not applicable.

Table 3 Types and Number of Liquid Waste Related Permits Issued 2019-2020

Permit Type/Name*	Number of Permits*	Referenced Bylaw*

**City of Vancouver Only*

Action 1.1.16 – Identify and regulate pesticides and lawn care products which negatively affect rainwater runoff quality and urban stream health *(2014).*

Narrative 2: Summarize approach to regulating pesticides & lawn care products for 2021-2022.

Adopted in 2009, Richmond's Enhanced Pesticide Management Program (EPMP) reduces the exposure of Richmond residents to unnecessary pesticide use. The program includes a regulation restricting the use of pesticides for cosmetic purpose, as well as resources to empower community members to make the switch to pesticide-free practices. In December 2015, the City adopted the Invasive Species Action Plan (ISAP), intended to build upon the accomplishments of the EPMP. ISAP includes strategies to reduce the economic and environmental risks of invasive species management by implementing monitoring and control procedures and increasing awareness of invasive species within the community.

ISAP delivers the City's early detection and rapid response program for public and private lands in order to ensure that pesticides and lawn-care products are deployed minimally and in a highly controlled fashion.

The City's Pesticide Use Control Bylaw No. 8514 restricts the cosmetic use of pesticides on residential and municipally-owned lands. In addition to bylaw enforcement, the City provides an expanded Education and Community Partnerships Program to inform the community about pesticide restrictions and to promote natural gardening and pest solutions. This includes a series of annual natural gardening workshops, a phone line to help residents learn proper plant care and sustainable pest solutions, and information sheets available through the City's website.

The City of Richmond acts to protect its watercourses and soil further through its Pollution Prevention and Clean-up Bylaw No. 8475. This Bylaw prohibits the spilling or dumping of polluting substances into the City's storm drainage system, open watercourses, or soil. Persons or businesses that store or handle potentially polluting substances are required by the Bylaw to store them in such a way as to prevent their spillage into the environment. The City regulates construction dewatering through Part 6.1.2.1 of this bylaw. Applicants planning to discharge to the City's storm sewer system are required to submit a comprehensive permit application package and monitor discharge using predominantly field measurable criteria.

Table 4 Products Regulated to Protect Stormwater Runoff Quality

Regulated Products	**Type of Regulation** *(Sales Ban, Use Ban, Permit, Limited Users, etc.)*	**Additional Information** *(Referenced Bylaw & Policy Numbers)*
Pesticides	Limited users	Pesticide Use Control Bylaw No. 8514 – Amendment Bylaw 9574.

Action 1.1.17 – Continue outreach plans to support liquid waste source control programs *(Ongoing).*

Narrative 3: Summarize 2021-2022 updates to outreach plans for supporting liquid waste source control programs (e.g. stormwater, sewer use, sewer maintenance, I&I management, cross connections etc.).

Grease Reduction and Green Cart Programs

The City maintains a Grease Management Program which includes grease source control, sanitary sewer system monitoring and inspection, and on-going maintenance work. A full-time bylaw enforcement officer is dedicated towards liquid waste source control and grease management. This officer continued to work with representatives from Metro Vancouver, stakeholder groups, industry associations,

pumping operators and grease trap vendors to mitigate the impact of fats, oils and grease on the region's sanitary sewer system.

Richmond residents have had access to food scraps recycling services with the Green Cart Program since 2013, which helps reduce the amount of waste that would otherwise be discharged into the sanitary sewer. Through the Green Cart program, approximately 45,000 tonnes of food scraps and yard trimmings were collected. To facilitate grease reduction in the sanitary system, Richmond conducts the following activities:

- Provide Green Cart Program information in brochures, guides, and annual reports, as well as on City website and social media, which includes information on the impact of grease on the sewer system, as well as proper grease disposal techniques, noting that small amounts of grease and oil that can be absorbed by newspaper or paper towel should be recycled in the Green Cart.
- Promote proper disposal of cooking oil and grease through community outreach which includes recycling workshops, booths at community events, and recycling information sessions in multi-family buildings.
- Discourage the use of garburators as part of the Green Cart Program.
- Encourage drop-off options for oil and grease at the Recycling Depot which includes signage to simplify the drop-off process for residents.
- Launched a Multi-Family Grease Collection Pilot Program to collect grease from 934 residential units in 6 buildings, and assess impacts on the sanitary sewer system. Findings of this program are expected in the next reporting period.

Metro Vancouver Waste Water Discharge Permit Process

The City continues to participate in the Metro Vancouver sanitary sewer source control program by supporting the Metro Vancouver Waste Water Discharge Permit process.

Rainwater Best Management Practices

Richmond's Official Community Plan Bylaw No. 9000 – Schedule 1, Section 14.2.10, Development Permit Guidelines – Green Buildings and Sustainable Infrastructure, provides general direction in regards to the voluntary undertaking, where feasible, of green building and sustainable infrastructure to support City of Richmond sustainability objectives and help reduce the demand for energy and resources. Developers are encouraged to incorporate green roofs, bio-swales, infiltration and other best management practices throughout the building site to store rainwater, mitigate urban heat island effect, reduce heating and cooling loads, and reduce the impacts on City drainage systems.

Richmond's Integrated Rainwater Resource Management Strategy contains initiatives to strategically implement stormwater detention and rainwater re-use measures, and to encourage stormwater detention on private properties in order to reduce stormwater runoff. In addition, the strategy works to strengthen erosion and sediment control, and to encourage water quality improvements.

Richmond's Ecological Network Management Strategy (ENMS) was adopted in 2015 and provides the ecological blueprint for the City to protect, connect and enhance the natural and green spaces throughout Richmond and beyond. It is an opportunistic approach for managing and guiding decisions

regarding the city-wide system of natural areas and the ecosystem services they provide. It is designed to complement existing development processes and regulations in order to integrate ecological connectivity and health into all neighbourhoods and land-uses. The ENMS contains extensive actions and initiatives on the integration of rainwater Best Management Practices tailored to various land uses within the City. These include green infrastructure (e.g., rain gardens, swales, harvesting) development in parks and through planning processes, riparian corridor enhancements, and the review and update of bylaws.

Mitchell Island Environmental Stewardship Initiative

In November 2021, the City of Richmond received an Environmental Managers Association Award for discharge control on Mitchell Island. Mitchell Island is an important industrial hub within the City of Richmond that is connected to the ecologically sensitive Fraser River through the City's drainage infrastructure. Persistent environmental concerns have been noted in the area and in response, Richmond has implemented a program to promote environmental stewardship among local business owners, to assess and monitor the health of the island environment, and to improve collaboration between staff and senior governments. The program has generated new levels of cooperation amongst stakeholders on Mitchell Island, and identified and mitigated numerous sources of Fraser River water contamination with a comprehensive stormwater sampling component. Many businesses, once made aware of their impacts, have been quick to install pollution mitigation infrastructure such as settling ponds, pH correcting technologies, impervious surfaces, and wheel washes, resulting in measurable improvements to island storm discharge water quality. In 2021 and 2022, murals were installed at two prominent locations communicating the importance of the environment to island businesses. The City additionally installed real-time water quality monitoring at one of the island outfalls collecting pH, conductivity and temperature data, and finished a study identifying potential green infrastructure opportunities on the island to improve stormwater quality.

Rain Barrel Program

The City offers rain barrels to Richmond residents at subsidized prices.

Low-Flow Toilet Rebate Program

The City offers a $100 rebate to residents for replacing old toilets with new low-flush toilets to reduce waste volume through water conservation.

Water Meter Programs

The City maintains an advanced water metering program to encourage water conservation. All commercial and industrial water use is metered. The Universal Water Metering program for all single-family properties has been completed by the end of 2017. The City initiated a volunteer water metering program for multi-family units in 2013. Resulting from this volunteer program, about 56% of the multi-family units in Richmond have been metered for water, and approximately 98% of metered multi-family complexes have saved money compared to the flat rate as of the end of 2022. In 2022, the City began

implementation of a mandatory universal multi-family metering program to further promote water conservation in these buildings.

Water metering provides customers increased rate equity compared to the flat rate and a tool to manage their costs, while consumption monitoring allows staff to identify leaks and system inefficiencies to minimize wastage. Since 2003, the City has managed to reduce total water consumption despite an overall 26% population increase. This is a strong indication that water conservation efforts to date have been effective in reducing water use and sewerage discharge correspondingly to minimize capital replacement needs.

The City continues to leverage its water meter infrastructure to further enhance customer service and water conservation strategies through a fixed based network. This advanced metering infrastructure provides staff with real-time consumption data that can help customers identify leaks, inform water consumption habits, and enhance revenue forecasting.

Action 1.1.18 – Develop and implement inflow and infiltration management plans, using the Metro Vancouver template as a guide, to ensure wet weather inflow and infiltration volumes are within Metro Vancouver's allowances as measured at Metro Vancouver's flow metering stations *(2012)*.

Narrative 4: Summarize I&I management plans & list key actions resulting from plans in 2021-2022. If no work was initiated or undertaken for 2021-2022, then indicate "Same as the last reporting period: no changes".

Richmond monitors inflow and infiltration (I&I) at the catchment level through pump runtimes at sanitary pump stations. Automated pump runtime data collection has been set up through the SCADA network, and detailed pump runtimes are captured in data loggers that are manually downloaded to spreadsheets and subsequently converted to sanitary flow rates.

Richmond has installed pressure sensors at sanitary pump stations, and continues to install magnetic flow meters at new sanitary pump stations. In addition, rainfall sensors have been installed to more accurately identify the sanitary system response to rainfall events. In 2022, the City adopted a new methodology to analyze automated pump station data to help determine catchments with excessive I&I for further study. This new methodology is based on Metro Vancouver's Envelope Method. The City will continue the analysis of automated pump station data and review of sanitary system response to rainfall events.

Richmond began CCTV inspections of its gravity sanitary sewers in 2002. By 2015, CCTV inspections have been completed for 100% of Richmond's gravity sewers. A dynamic GIS layer was introduced in 2018, linking CCTV inspection videos to the asset management system, enhancing access to and documentation of inspection results and asset condition assessments. The CCTV inspection layer was leveraged for the next cycle of sanitary sewer CCTV inspections that started in 2016 and is underway.

Attachment 1:

a) I&I Mapping showing I&I rates for neighbourhoods where studies have been completed with before and after I&I (L/ha·d). Objectives to Illustrates catchment areas covered by I&I studies.

b) Transmit an electronic copy of GIS shape files for study catchment boundaries to Metro Vancouver.

Action 1.1.19 – Enhance enforcement of sewer use bylaw prohibition against the unauthorized discharge of rainwater and groundwater to sanitary sewers *(2010).*

Narrative 5: Summarize enforcement enhancements and process effort changes during 2021-2022. If no changes, then enter "Same as the last reporting period: no changes".

Table 5 Bylaws Regulating Discharges of Groundwater and Rainwater to Sanitary Sewers

Regulation or Bylaw No.	Date	Summary of Any Changes 2021-2022*
Flood Protection Bylaw No. 10426	Effective Date – January 1, 2023	Separated from and replace combined Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551 – no changes to regulations with respect to groundwater discharge.
Sanitary System Bylaw No. 10427	Effective Date – January 1, 2023	Separated from and replace combined Drainage, Dyke and Sanitary Sewer System Bylaw No. 7551 – no changes to regulations with respect to groundwater discharge.
Pollution Prevention and Clean-Up Bylaw No. 8475	Effective Date- October 13, 2009	No changes

**if no changes, enter "no changes" in table.*

Action 1.1.20 – Update municipal bylaws to require on-site rainwater management sufficient to meet criteria established in municipal integrated stormwater plans or baseline region-wide criteria *(2014).*

Narrative 6: Highlight and summarize any bylaw changes or development effort relating to stormwater management for 2021-2022. If no changes, indicate "Same as the last reporting period: no changes".

The region wide baseline has been approved by the Board for use by Municipalities and ISMP's should be in implementation phase. Please list below the bylaws requiring on-site stormwater management per this action.

Same as the last reporting period: no changes.

Table 6 Bylaws Related to On-site Stormwater Management

Related Stormwater Bylaws	Changes to On-Site Stormwater Management Target/Objectives (2021-2022)*
Green Roofs & Other Options Involving Industrial & Office Buildings Outside the City Centre Bylaw No. 8385	No changes
Official Community Plan Bylaw No. 9000	No changes regarding on-site stormwater management
Pollution Prevention and Clean-Up Bylaw No. 8475	No changes

**if no changes, enter "no changes" in the table.*

Action 1.1.21 – Update municipal utility design standards and neighbourhood design guidelines to enable and encourage on-site rainwater management *(2014)*.

Narrative 7: Highlight and summarize changes for 2021-2022 to utility design standards and neighbourhood design guidelines in relation to on-site rainwater management. If no changes were made or processes initiated, then indicate "Same as the 2019-2020 reporting period: no changes".

Same as the last reporting period: no changes.

Table 7 Municipal Standards, Guidelines and Policy Changes Related to On-site Stormwater Management

Name of Standard, Guideline or Policy	Changes for 2021-2022
City of Richmond Engineering Design Specifications	No changes with respect to rainwater management.
City of Richmond Integrated Rainwater Resource Management Strategy	No changes with respect to rainwater management.
City of Richmond Ecological Network Management Strategy	No changes with respect to rainwater management.
Mitchell Island Environmental Stewardship Initiative	No changes

**Summarize any changes from the last report (if no changes, enter "No changes"). Otherwise, briefly summarize if a new bylaw.*

Action 1.2.5 – Work with Metro Vancouver to develop and implement municipal-regional sanitary overflow management plans as set out in 1.2.4 *(2013)*.

Narrative 8: Summarize development of any municipal sanitary overflow management plans for 2021-2022. Highlight any specific examples. If no new plans developed, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

The City has a large number of small sanitary catchments due to Richmond's flat topography and high water table. Each catchment is serviced by a gravity collection system that feeds a dedicated pump station. In the event of a pump station failure, the flat nature of catchment topography facilitates utilization of the entire gravity collection system as short-term storage. For longer failures, the relatively small size of each gravity catchment maintains sanitary flows at a rate that can be serviced by tanker trucks.

The City also maintains a fleet of standby generators to maintain pump station operation during power failure. Larger stations include dedicated generator facilities, and all new pump stations in high-density development areas include dedicated emergency generators.

Action 1.2.6 – Burnaby, New Westminster and Vancouver will work with Metro Vancouver to give effect to 1.2.2 and, specifically, implement plans to prevent combined sewer overflows by 2050 for the Vancouver Sewerage Area and 2075 for the Fraser Sewerage Area and separate combined sewers at an average rate of 1% and 1.5% of the system per year in the Vancouver Sewerage Area and Fraser Sewerage Area respectively *(Ongoing).*

Narrative 9: Highlight and summarize progress on the prevention of CSOs and the separation of combined sewers for 2021-2022.

Not applicable as there are no combined sewers in Richmond.

Attachment 2:

a) Mapping showing where sewer separation work occurred in 2021-2022

b) GIS shape files of the locations where sewer separation occurred in 2021-2022 for composite mapping

c) GIS shape files of catchments of remaining combined sewer catchments as of December 31, 2022 (if separated catchments discharge to combined sewers, code the separated catchments as "separated").

Action 1.3.11 – Develop and implement operational plans for municipal sewerage facilities to ensure infrastructure reliability and optimal performance *(Ongoing).*

Narrative 10: Discuss approaches and strategies applied in 2021-2022 that address risks (i.e. regular maintenance, SCADA, monitoring, protocols, identified redundancies/contingencies). If these are the same as the previous reporting period, then indicate "no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Same as the last reporting period: no changes.

Richmond has an ongoing Ageing Infrastructure replacement program with dedicated funding from the Sanitary Sewer Utility that maintains the sanitary system in an appropriate operating condition.

The City has a SCADA monitoring system for its 153 sanitary pump stations that identifies and records various alarm states and operational data.

New pump stations include a duplex pump configuration to provide system redundancy.

Richmond has a gradual sanitary pump station start-up procedure to minimize stress on the sanitary pressure system after BC Hydro power failure events. High volume and critical sanitary pump stations have standby generator provisions in place to minimize the impact of power failure.

Pump stations are inspected and cleaned on a regular basis.

The second cycle of CCTV inspection of Richmond's gravity collection system since the adoption of the ILWMP is underway in part to support ongoing CCTV inspection and remediation programs for pipelines with chronic issues.

Richmond maintains a spare equipment and materials inventory (including pumps, pipes, valves, etc.) for unplanned maintenance and emergency events.

Richmond has an on-going grease monitoring and cleaning program to maintain gravity sanitary sewers and pump stations in good operating conditions. Richmond has a number of source control programs and initiatives to reduce the amount of grease introduced to the sanitary system.

Richmond's fleet includes tanker trucks and Richmond has a standing agreement with McRae's Environmental Services Ltd. for additional tanker resources to supplement the City's fleet when required. The City opportunistically installs forcemain access points to minimize public impacts, costs and logistics of tanker resources.

Action 1.3.12 – Work with Metro Vancouver to develop and implement emergency sanitary sewer overflow plans including contingency plans to minimize impacts of unavoidable sanitary sewer overflows resulting from extreme weather, system failures or unusual events *(Ongoing)*.

Narrative 8: Identify any emergency procedures & protocols developed for 2021-2022. If these are the same as the previous reporting period, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Richmond does not have any combined sewer systems and chronic sanitary sewer overflow issues due to weather or rainfall. During the 2021-2022 reporting period, Richmond experienced two sanitary

sewer overflow events related to the sanitary pump stations during the wet season. These overflow events were related to the significant atmospheric river event on November 15, 2021, and were caused by connection of site drainage to the station's wet well. Richmond crews responded to the overflow events promptly, and completed the design work to eliminate such drainage connections into the sanitary system in 2022. Construction of this work is planned to start in early 2023.

There have been no changes to the emergency management plan, procedures, and protocols outlined for the 2020-2021 reporting period as Richmond does not typically experience SSO's.

Attachment 3:

Map and GIS data showing location of emergency municipal overflows (unless there are updates, this information should have already been provided through a separate request through the REAC LWSC as well as in the 2019-2020 reporting). If already provided, please indicated so.

Action 1.3.13 – Work with private marina operators, Ministry of Environment and Environment Canada to develop and implement regulations to ensure all new marinas and marinas where planned renovations exceed 50% of the assessed existing improvements value have pleasure craft pump-out facilities *(Ongoing)*.

Table 8 Bylaws and Regulations Requiring Pleasure Craft Pump-out Facilities at Marinas

Regulation Process or Bylaw*	Date*
Public Health Protection Bylaw No. 6989, Subdivision Two – Marina Health and Safety Regulation	Effective Date – March 13, 2000

** If these are the same as the previous reporting period 2019-2020, then indicate "Same as the last reporting period: no changes".*

Action 1.3.14 – Require all pleasure craft pump-out facilities to connect to a municipal sanitary sewerage system or a provincially permitted on-site treatment and disposal system or have established enforceable protocols for transporting liquid waste for disposal at a permitted liquid waste management facility *(Ongoing)*.

Narrative 11: Describe any additional regulations and the number of on-site treatment systems required/installed during the reporting period 2021-2022. If these are the same as the previous reporting period 2019-2020, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Action 1.3.15 – Continue existing municipal odour control programs and implement new programs for targeted municipal sewer facilities *(Ongoing, see Action 3.3.4).*

Narrative 12: Summarize existing municipal odour control programs and the implementation of new programs for targeted municipal sewer facilities for the reporting period 2021-2022. If these are the same as the previous reporting period 2019-2020 then indicate "Same as the 2019-2020 reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the 2019-2020 reporting period except for..."

Same as the 2021-2022 reporting period: no changes.

Odour is primarily controlled through appropriate design and maintenance of the City's sanitary system. This includes designing pump stations and conveyance infrastructure to minimize sewerage residence time and turbulence, maintaining a closed system, and completing regular maintenance and cleaning of the system to ensure the system is operating properly. These measures are standard practice within the region and are an effective approach for managing odour in a system of the City's scale. Odour complaints received from the public are actively investigated and addressed by City staff.

Attachment 4:

a) *2021-2022 map showing odour control facilities & locations of complaints (different than facility)*

b) *GIS shape files for the odour facility and complaint mapping to allow for development of composite mapping*

Action 1.3.16 – Develop and implement air emissions management programs for standby power generators at municipal sewer pump stations *(2016).*

Narrative 13: Summarize air emissions management programs for standby power generators at municipal sewer pump stations. If these are the same as the previous reporting period 2019-2020, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..." This action should be complete by now.

***Notes:** Metro Vancouver developed "Specifications for New Diesel Powered Vehicles & Equipment" as part of its green procurement process (details were previously shared with the REAC-LWS and are available from MV).*

Same as the last reporting period, except the City is currently evaluating electric options suitable for pump station use.

Sanitary pump station standby generators are exempt from Metro Vancouver's Non-Road Diesel Engine Emission Regulation Bylaw 1329 falling under emergency engine requirements. Inventory replacements still meet the highest regulatory requirements to minimize emissions.

Action 1.3.17 – Develop and implement programs to reduce greenhouse gas emissions from municipal liquid waste management systems to help achieve federal, provincial and municipal greenhouse gas targets *(Ongoing, see Action 3.1.5)*.

Narrative 14: Summarize air emissions management programs for standby power generators at municipal sewer pump stations. If these are the same as the previous reporting period 2019-2020, then indicate "Same as the last reporting period: no changes", or if only minor changes, enter appropriate text similar to "Same as the last reporting period except for..."

Richmond is continuing to work with Metro Vancouver to implement a sewer heat recovery system on the Gilbert Trunk Sewer as part of the City Centre District Energy Utility (CCDEU). At full build-out, this project will result in an estimated annual reduction of over 9,000 tonnes of CO_2e GHG emissions. Lulu Island Energy Company Inc. (LIEC), a City-owned corporation that manages district energy initiatives on behalf of the City, in partnership with Corix Utilities Inc., provides thermal energy services to developments within the Oval Village and City Centre service areas. To date, over 4,100,000 ft^2 (270,000 m^2) of floor space is connected to the CCDEU system.

In September 2022, LIEC, Corix Infrastructure Inc., and The Canada Infrastructure Bank (CIB) achieved financial close on a 30-year expansion project for the City Centre service area, including up to $175 Million in financing from CIB. This will enable expansion to more than 170 new residential and mixed-use commercial development sites in the area by 2050, using low-carbon heat recovered from the Gilbert Road regional sewer system as the primary thermal energy source. By full build-out, the project is expected to reduce greenhouse gas emissions by one million tonnes by 2050, with the amount of connected space to the district energy system increasing 10 fold to approximately 50 million square feet.

The City is continuing to assess potential for cost-effective implementation of smaller-scale "micro" sewer heat recover plants, which could provide heating and/or cooling for a smaller-scale stand-alone developments, or act as an ancillary heating input to the City's large District Energy networks.

Action 3.1.6 –	Assess the performance and condition of municipal sewerage systems by: (a) inspecting municipal sanitary sewers on a twenty year cycle, (b) maintaining current maps of sewerage inspection, condition and repairs, and (c) using the Metro Vancouver "Sewer Condition Report, November 2002" as a guide to ensure a consistent approach to sewer system evaluation and reporting *(Ongoing).*

Narrative 15: Summarize key progress on the assessment and condition of municipal sewerage system for 2021-2022. If these are no changes since the previous reporting period 2019-2020, then indicate "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Sanitary Pump Station condition assessments for 153 pump stations, phase 1 of 2, consisting 50 pump stations, were completed in 2021. Phase 2, consisting of the remaining 103 pump stations, would be completed by next reporting period.

The next cycle of municipal sanitary sewer inspection is underway; refer to table 10 for progress summary.

Attachment 5:

a) *A map showing sewerage system CCTV inspection for 2021-2022 and the other areas of CCTV inspection work in a different colour over the previous 22 years (2000-2022).*

b) *A map showing any sewer replacement /rehabilitation work for 2021-2022 as part of either asset management or capacity upgrades. Indicate whether the work is for upgrades or maintenance.*

Action 3.1.8 –	Develop and implement asset management plans targeting a 100 year replacement of rehabilitation cycle for municipal sewerage infrastructure and provide copies of such plans to Metro Vancouver *(2014).*

Narrative 16: Summarize key progress or accomplishments on the development of asset management plans for municipal sewerage infrastructure for 2021-2022.

Richmond has an ongoing Ageing Infrastructure Replacement Program with dedicated funding from the Sanitary Sewer Utility that maintains the sanitary system in an appropriate operating condition. Staff report to City Council on a regular basis regarding the status of the program, including current infrastructure status, long-term funding requirements and funding gaps if they exist. The 2022 program update identified a long-term, sustainable capital requirement of $12.2M and an annual budget of $5.8M. As part of the 2023 Utility Budgets and Rates process, Council endorsed an increase in funding for annual sanitary capital upgrades from $5.8M to 6.3M.

The City updated both sanitary and drainage models in 2021 and 2022, respectively, to help guide planning and development for sewer upgrades, replacement, and rehabilitation works.

Attachment 6:

a) *Titles of any completed asset [replacement] management plans (author, date, title, and publisher) for 2021-2022.*

Milton Chan, P.Eng., June 8, 2022, Ageing Utility and Road Infrastructure Planning – 2022 Update, City of Richmond (REDMS 6985055)

Ivy Wong, November 16, 2022, Proposed 2023 Capital Budget, City of Richmond (https://www.richmond.ca/cityhall/finance/reporting/fiveyear.htm)

b) *John Irving, P.Eng., MPA, Jerry Chong, CPA, CA, October 18, 2022, 2023 Utility Budgets and Rates, City of Richmond (http://citycouncil.richmond.ca/ shared/assets/2023 Utility Budgets and Rates65805.pdf)*

c) *Completed annual PSAP 3150 reporting on asset values for 2021-2022. Completed annual reporting of tangible capital assets in the 2021 financial statements in accordance with PSAB 3150.*

d) *Colour coded map showing age of the sewerage system (i.e.: <1900, 1901-1925, 1926-1950, 1951-1975, 1976-2000, >2001) updated to show any changes made in 2021-2022. If no changes, please indicate so and the mapping prepared for the 2021-2022 reporting period will be used.*

Action 3.2.4 –	Undertake a tri-annual internal audit of best practices of one municipal liquid waste management sub-program in each municipality to identify opportunities for innovation and improvements *(Triennially).*

Narrative 17: Summarize key findings from the tri-annual internal audit (starting in 2013).

Ageing Infrastructure Planning Program

In 2022, Richmond conducted an update on the Ageing Infrastructure Planning Program, which included reconciling current inventory, reviewing the evolving theory on infrastructure service life, and updating infrastructure replacement pricing.

This report identified the following key findings:

- Infrastructure replacement costs continue to increase due to inflation, environmental requirements and pump station complexity.
- Development facilitates significant infrastructure replacement, having a positive impact on the City's overall ageing infrastructure picture. However, development is subject to external factors, such as the economy, and does not always coincide with infrastructure that is beyond its useful life. Therefore, development is not considered a sustainable resource for ageing infrastructure replacement.
- The long-term, sustainable capital requirement is $12.2M for the sanitary utility. The current budget for 2023 is $6.3M. Closing the funding gap is achievable through the annual budgeting process.

Action 3.3.6 – In collaboration with Metro Vancouver, estimate and document the greenhouse gas emissions and odours associated with the operation of the municipal and regional liquid waste management systems *(2014)*.

Narrative 18: Summarize the estimate of greenhouse gas emissions associated with the operation of municipal and regional liquid waste management systems. Odour control and mapping are being reported under Action 1.3.15.

The estimated total emissions due to electricity use at sanitary pump stations and sanitary fleet fuel use for operational tasks:

Year	$BioCO_2$ (tonnes)	CO_2e (tonnes)
2021	29.3	145.6
2022	36.9	144.5

Action 3.3.7 – Estimate and report on the frequency, location and volume of sewerage overflows from municipal combined and sanitary sewers, and where feasible identify and address the probable causes *(Ongoing)*.

Narrative 19: Summarize and highlight any important details and/or action plans relating to managing wet weather SSOs, CSOs and dry & wet weather SSOs during the period 2021-2022. If no changes since 2019-2020, then indicate "Same as the last reporting period: no changes".

For each CSO location, in a table indicated estimated volumes & number of occurrences (this will have been prepared for EC WSER reporting but is also required by the LWMP).

Richmond does not have combined sewers and have no CSO's. One wet weather SSO occurred. The cause was identified as a cross-connection between the drainage and sanitary sewer system at the

Edgemere sanitary pump station. Design work to eliminate this cross connection has commenced, with construction to take place in early 2023.

Attachment 7:

a) *Provide (if not already provided) GIS shape files which have the locations of the CSO outfalls for purposes of summary mapping (should already be reported under WSER).*

b) *Provide GIS shape files or coordinates for the locations of wet & dry weather SSOs for each year (indicate which is dry/wet and year). Include SSO dates and estimated volume.*

Action 3.3.8 – Maintain and, if necessary, expand the existing municipal sewer flow and sewer level monitoring network *(Ongoing).*

Narrative 20: Summarize and highlight any changes to the existing municipal sewer flow & sewer level monitoring network for 2021-2022 (if no changes, then indicate "Same as the last reporting period: no changes").

Same as the last reporting period: no changes.

The City has a SCADA monitoring system for its 153 sanitary pump stations that identifies and records various alarm states and operational data, including automated pump runtime data that are used to calculate sanitary flow rates. This system is monitored on a 24/7 basis by City staff, with staff on-call at all times to respond to any incidents in a timely manner.

Attachment 8:

a) *Map and GIS coordinates showing locations of active municipal sewer flow/level monitors for the reporting period 2021-2022 (indicate whether permanent or temporary)*

Action 3.4.4 – In collaboration with Metro Vancouver and the Integrated Partnership for Regional Emergency Management (IPREM), develop emergency management strategies and response plans for municipal and regional wastewater collection and treatment systems *(2015).*

Narrative 21: Summarize any work on emergency management strategies and response plans for municipal & regional wastewater collection and treatment systems in 2021-2022.

The City maintains an inventory of portable diesel standby power generators on trailers. These generators are intended to provide back-up power for sanitary and drainage pump stations in the event of emergency power failures, and is the primary response plan for stations that do not have built-in generators. Built-in backup generators are incorporated into new or upgraded stations constructed within City Centre where possible.

The City is investigating resilience systems for sanitary pump stations focused on onsite energy generation, reducing the City's reliance on diesel generators for back-up power. This project is ongoing and currently in its design stage.

Action 3.4.5 – Adapt infrastructure and operations to address risks and long-term needs *(Ongoing).*

Narrative 22: Summarize any key initiatives that support the adaptation of infrastructure & operations to address risks and long term needs (e.g. climate change, sea level rise, seismic risk, demographic growth, etc...). If no change from 2019-2020, then indicate, "Same as the last reporting period: no changes".

Richmond's Flood Protection Management Strategy identifies climate change issues and provides high-level guidance on the City's flood mitigation improvements. A key component of the Flood Protection Management Strategy is the Dike Master Plan, which guides the City's dike raising efforts. The plan is being completed in multiple phases, each identifying dike upgrade options and recommendations for different areas throughout the City. In 2022, staff have completed a draft of Dike Master Plan Phase 4 for the purposes of public and stakeholder engagement. The engagement process is underway, and the plan is intended to be finalized in 2023.

The City is continuing to implement flood protection upgrades, improving seismic resilience and preparing the City for climate change. Two drainage pump stations and 1.9 km of dikes have been upgraded during the 2021 to 2022 reporting period.

Action 3.4.6 – Ensure liquid waste infrastructure and services are provided in accordance with the Regional Growth Strategy and coordinated with municipal Official Community Plans *(Ongoing).*

Attachment 9:

a) If not already provided, provide updated GIS shape files of the municipal sanitary sewer network, including manholes, pump stations, pipe diameters for the municipal sewer system. Please indicate what changes have been made for 2021-2022.

***NOTE:** This information is part of the routine information provided to Metro Vancouver every two years in response to municipal obligations under the GVS&DD Act. This information will be used to update Metro Vancouver's GIS database. If this information is open-source and already available online, please just indicate that it is available online and is open-source.*

Action 3.4.7 – Develop and implement integrated stormwater management plans at the watershed scale that integrate with land use to manage rainwater runoff *(2014).*

Narrative 23: Summarize and highlight key initiatives relating to the development and implementation of the integrated stormwater management plans ***for each watershed/ISMP area.***

NOTE: *Format and content should be similar to the reporting provided in previous Interim Reports for the Integrated Liquid Waste and Resource Management Plan. See:*

http://www.metrovancouver.org/services/liquid-waste/LiquidWastePublications/LWMP_2022_Interim_Report-_Status_SSO_ISMP.pdf

Same as the last reporting period: no changes.

Attachment 10:

a) GIS shape files showing the ISMP boundaries and their status: Development Phase= Yellow; Implementation Phase = Light Green; Completed Phase = Dark Green. Add ISMPs still to start development as outlined only).

NOTE: *The ISMPs will be summarized and mapped similar to the Biennial and Interim Reports.*

Action 3.5.8 – Biennially produce a progress report on plan implementation for distribution to the Ministry of the Environment that: (a) summarizes progress from the previous two years on plan implementation for all municipal actions, including the status of the performance measures, (b) includes summaries and budget estimates for proposed LWMP implementation programs for the subsequent two calendar years *(July 1st biennially).*

List budget estimates for the LWMP implementation programs and subsequent two years beyond biennial report (from the 5-year plan)

Table 9 Summary of LWMP Implementation Budgets and Forecasts

LWMP Implementation Action	Details/Notes	Budget			
		2021	2022	2023*	2024*
Sanitary Sewer Capital Program	Includes pump station replacement, gravity sewer and forcemain replacement, and sanitary rehabilitation works	*$3.6M*	*$4.3M*	*$3.9M*	*$3.3M*
Development Projects (Servicing Agreements)		*$0.5M*	*$2.0M*	*Unknown*	*Unknown*

** Subject to council approval*

Action 3.5.9 –	*This reporting is an annual requirement. In the year of the biennial report, this action is covered off by municipal reporting on 3.4.7 & 3.3.7. In other years this addressed through the Interim Report. This municipal reporting is summarized regionally by Metro Vancouver under its Action 3.5.6.*

***Note**: The Interim Report: 2022 was submitted to the Ministry of Environment in February 2022. There is nothing to add in this section.*

Ministerial Condition 2 –	Member municipalities are strongly encouraged to business case and/or implement residential water metering programs and to consider municipal rebate programs for water efficient fixtures and appliances to reduce potable water use.

Narrative 24: Discuss initiatives that evaluate/support water metering and rebate programs to water fixtures and appliances

Richmond has comprehensive water meter programs for both residential and commercial properties. All single-family, industrial, commercial, and farm properties in Richmond are metered. In 2017, Richmond completed implementation of universal water metering for all single-family properties. The City initiated a volunteer water metering program for multi-family complexes in 2013, and began implementation of a mandatory universal multi-family metering program for multi-family complexes in2022. As of the end of 2022, about 56% of multi-family properties have been metered in Richmond.

To complement these water meter programs, Richmond provides metered customers with free water conservation kits, which include low-flow showerheads, faucet aerators, toilet fill cycle diverters, toilet leak detection tablets, and educational water conservation tools. In addition, Richmond offers a $100 rebate to residents for replacing old toilets with new low-flush toilets, and subsidizes rain barrels to collect and store water for outdoor use. By the end of 2022, a total of 10,853 toilet rebates and 2,296 rain barrels have been issued to Richmond residents. Richmond also partnered with BC Hydro between 2014 and 2020 to offer $100 rebates for high-efficiency clothes washer replacements. By the end of this program in 2020, the City has issued 1,369 rebates to Richmond residents.

Ministerial Condition 3 –	Metro Vancouver, in partnership with member municipalities, is encouraged to pursue a region-wide water conservation program targeting the industrial, commercial, institutional and agricultural sectors as part of its new Drinking Water Management Plan. Remaining municipalities in the region that have not implemented metering for these sectors are encouraged to do so.

Narrative 25: Summarize whether any new municipal water metering policies or programs were introduced in 2021-2022 that address this action. If no changes, then indicate, "Same as the last reporting period: no changes".

Same as the last reporting period: no changes.

Industrial, commercial, and institutional (ICI) sector is fully metered. In addition, the City works closely with the agricultural industry to provide non-potable water for irrigation through watercourses. Select drainage pump stations also include features that allow the agricultural community to draw water in from the Fraser River to conserve significant amounts of drinking water. Same as the last reporting period: no changes.

Ministerial Condition 7 – Member municipalities will, with MV planning and coordination, and to the satisfaction of the Regional Manager, develop a coordinated program to monitor stormwater and assess and report the implementation and effectiveness of Integrated Storm Water Management Plans (ISMPs). The program will use a weight-of-evidence performance measurement approach and will report out in the Biennial Report. The Regional Manager may extend the deadline for completion of ISMP by municipalities from 2014 to 2016 if satisfied that the assessment program could result in improvement of ISMP and protect stream health.

Narrative 26: Quote relevant OCP sections addressing stormwater, stream health and their consideration of ISMPs.

Given the ISMP deadline requirement, please indicate any ISMPs in development but not completed by the end of 2022.

The Integrated Rainwater Resource Management Strategy (IRRMS) sampling program for water quality parameters was implemented in 2018, 2020, and 2022. Nine pump stations sample locations are regularly selected to be representative of the majority of Richmond stormwater discharge flow volume. Five samples are collected within 30 days in both the wet and dry seasons and analyzed for general water quality physical parameters (pH, temperature, total suspended solids, turbidity, conductivity) microbial indicators (fecal coliforms and E.coli) nutrients (nitrate) and select metals (total iron, cadmium, copper, lead, and zinc). Richmond stormwater generally has elevated levels of all of these parameters due its slow moving, bog ecosystem with abundant wildlife. Staff regularly use this stormwater quality data to inform stormwater planning, identify potential areas for stormwater source control outreach, and to determine pre-existing conditions in the event of a potential spill to the environment.

Attachment 11:

a) Monitoring results per watershed (as per ISMP Monitoring and Adaptive Management Framework endorsed by the Ministry of Environment and Climate Change Strategy)

Monitoring results for the 2021-2022 period will be available by Q2 2023

b) A map plus the GIS shape files/coordinates showing the location of monitoring sites

Ministerial Condition 9 – The ILWRMP has a goal of protecting public health and the environment. In keeping with this goal and to ensure alignment with other national, provincial and regional initiatives, Metro Vancouver and member municipalities are encouraged to: (a) Have a local land use planning consider the direction provided by the ISMPs, (b) Consider how the degree, type and location of development within a drainage can affect the long-term health of the watershed,(c) Consider how to protect the stream, including the riparian areas that exert an influence on the stream, from long-term cumulative impacts and (d) Use scenarios and forecasting to systematically consider environmental consequences/benefits of different land use approaches prior to build-out (for example, Alternative Future type approaches).

Narrative 27: Please describe any changes to how you have used proactive planning processes as listed in Ministerial Condition 9 for 2021-2022 and provide examples. If there are no changes since 2019-2020, then indicate: "Same as the last reporting period: no changes".

The strategies identified in the IRRMS are consistent with actions identified within the City's Ecological Network Management Strategy (ENMS), adopted by Council in 2015, and submitted in the 2015-2016 reporting period. Through the ENMS, the City has identified an interconnected network of natural and semi-natural areas across Richmond's landscape to protect, connect and restore. These natural areas include green infrastructure that provides essential ecosystems services related to stormwater management. Additional Actions under the ENMS related to Ministerial condition 9 in this reporting period include:

- Established in 1971, Canadian Environment Week celebrates Canada's environmental accomplishments and encourages Canadians to contribute to conserving and protecting their environment. In June 2022, the City's social media platforms communicated ways Richmond residents can prevent pollution for this week.
- In 2021 and 2022, the City commissioned a study by Kerr Wood Leidal (KWL) to identify green infrastructure solutions to improve water quality on Mitchell Island.
- In 2021 and 2022, the City regularly participated in regional Spill Response training and planning exercises. These training sessions helped to ensure the City was able to effectively identify and respond to spills to the environment. Additionally, internal staff training was provided to dispatch personnel to ensure the proper acceptance of calls from the public regarding spills to the environment.
- In 2021, the City developed an informational handout for industrial businesses on Mitchell Island, informing them on how to effectively report environmental issues to the applicable response agency.

- In partnership with the BC Ministry of Forests, the City of Richmond has been managing one of three infestations of Brazilian elodea (*Egeria densa*) in the province. Brazilian elodea is one of the most aggressive invasive aquatic aquarium trade species globally and can heavily impact drainage infrastructure, reducing water capacity and flow, as well as impacting native aquatic flora and fauna. The City has utilized novel control methods, such as diver-assisted suction dredging and water level manipulation, to achieve management targets. In 2021, after a four-year management program, no elodea was identified in the impacted water bodies. Much of the area has naturalized without intervention, and the project has moved into a monitoring phase to identify any regrowth.

Attachment 12:

a) Map showing any 2021-2022 changes to protected riparian areas & possible stream classifications. If no changes, then this figure is not required.

Municipal Progress Summary Table

The summary table is the same format at pervious Biennial Report. The columns "Dec 31st2020" from the previous Biennial Report plus "Additions/Changes" should add to equal the "Dec 2022" Total.

Table 10 Summary of Municipal Progress 2021-2022

Description	Unit	Total as of Dec 31st, 2020	Additions & Changes	Total as of Dec 31st, 2022
1. Municipal Sewer System Inventory				
a. Sanitary Gravity Sewers	m	468,880	1,170	470,050
b. Sanitary Services (Connections)	ea.	31,605	-13	31,592
c. Sanitary Forcemains	m	95,850*	0	95,850
2. Combined Sewer System Inventory				
a. Total Combined Sewers	m	n/a	n/a	n/a
b. Combined Services (Connections)	ea.	n/a	n/a	n/a
c. Combined Sewers Separated	m	n/a	n/a	n/a
d. Percentage of total system separated	%	n/a	n/a	n/a
3. Sanitary Sewer System Evaluation Program **				
a. Sanitary Sewers Video Inspected	m	41,511	30,865	72,376
b. Percentage of Entire Municipal Sewer System Dye & Smoke Tested	%	0.0	0.0	0.0
c. Percentage of Entire Municipal Sewer System Video Inspected	%	7.3	5.5	12.8
d. Percentage of Entire Municipal Sewer System Structurally Rated	%	7.3	5.5	12.8
4. Sewer System Rehabilitation				
a. Total Length of Sewers Rehabilitated	m	2,584	n/a	2,584
b. Total Length of Sewers Replaced/Capacity Upgraded	m	19,657	1,740	21,397
c. Total Number of Service Laterals Rehabilitated	ea.	54	7	61
d. Number of Structurally Repaired Manholes/Cleanouts	ea.	5,043	1,598	6,641
e. Number of Cross-Connections Corrected	ea.	11	n/a	11
5. Sanitary Sewer Overflows				
a. Total Number of Reported Dry Weather SSOs	ea.	0	0	0
b. Total Number of Reported Wet Weather SSOs	ea.	0	1	1

Description	Unit	Total as of Dec 31st, 2020	Additions & Changes	Total as of Dec 31st, 2022
c. Number of Breakdowns from Failures	ea.	147	10	157
6. Greenhouse Gas Emissions				
a. CO_2 emission reduction from sewer system	kg CO_2	n/a	n/a	n/a
7. Summary of Costs		**2021**	**2022**	**Total**
a. Sanitary Sewer Condition Evaluation Program		$0.6M	$0.1M***	$0.7M
b. Combined Sewer Separation Program		n/a	n/a	n/a
c. Sewer System Rehabilitation Program		$3.6M	$4.2M	$7.8M
d. CO_2 Reduction Program		0	0	0
e. ISMP Implementation		n/a	n/a	n/a
f. Total Cost for the Biennial Period		$4.2M	$4.3M	$8.5M

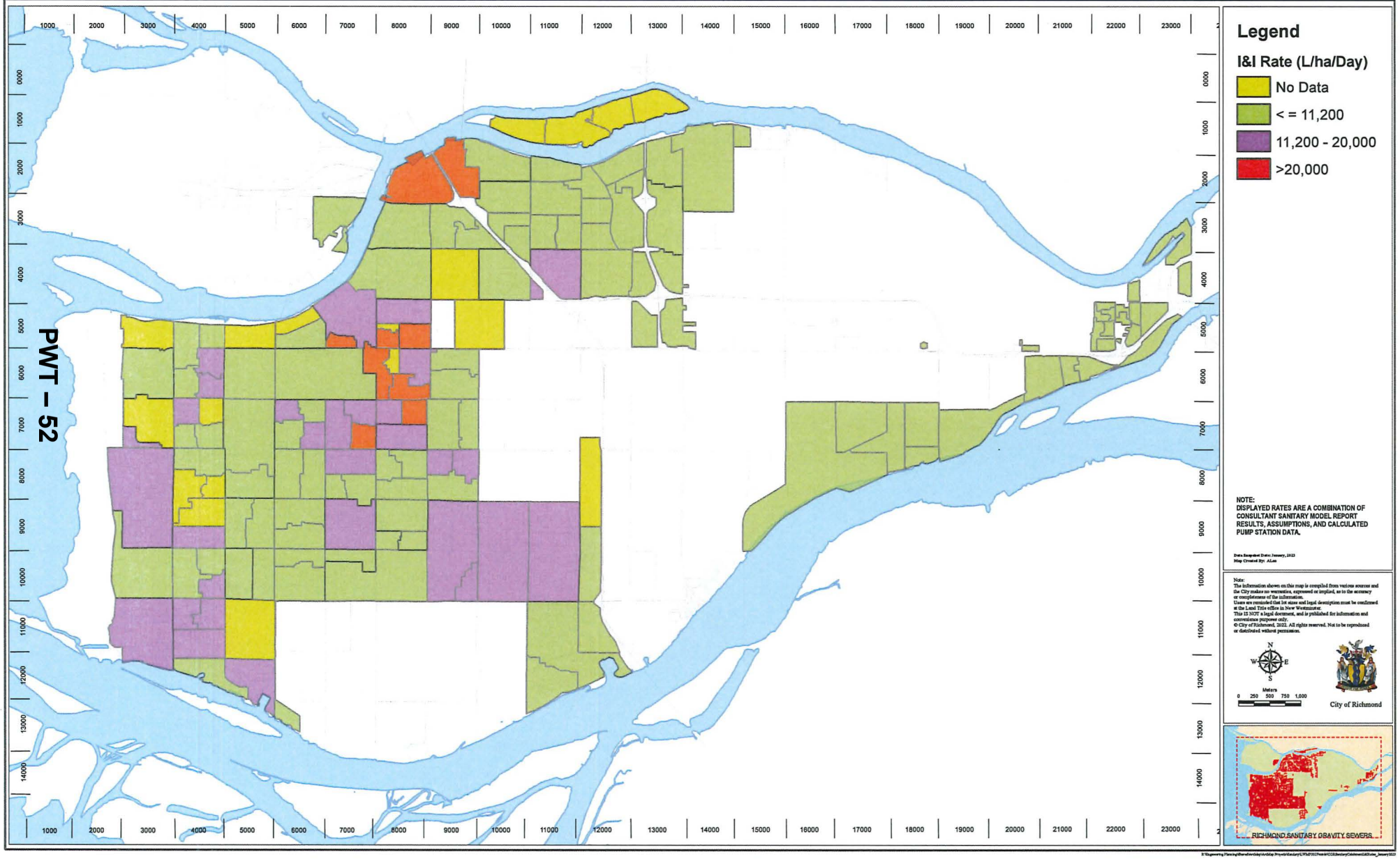
** Re-stated to reflect minor corrections and re-categorization in Richmond's asset management system during the reporting period.*

*** Richmond completed the previous cycle of Sanitary Sewer System Evaluation Program in 2015, and started the next cycle in 2016. The number in the "Total as of Dec 31st, 2020" column represents the quantity of CCTV completed since the start of the next cycle in 2016 up to 2020.*

**** Condition Evaluation Program included projects under line item "7c" that are not reflected under "7a".*

ATTACHMENT 1

City of Richmond Modelled Sanitary Catchment I&I Rates - January 2023



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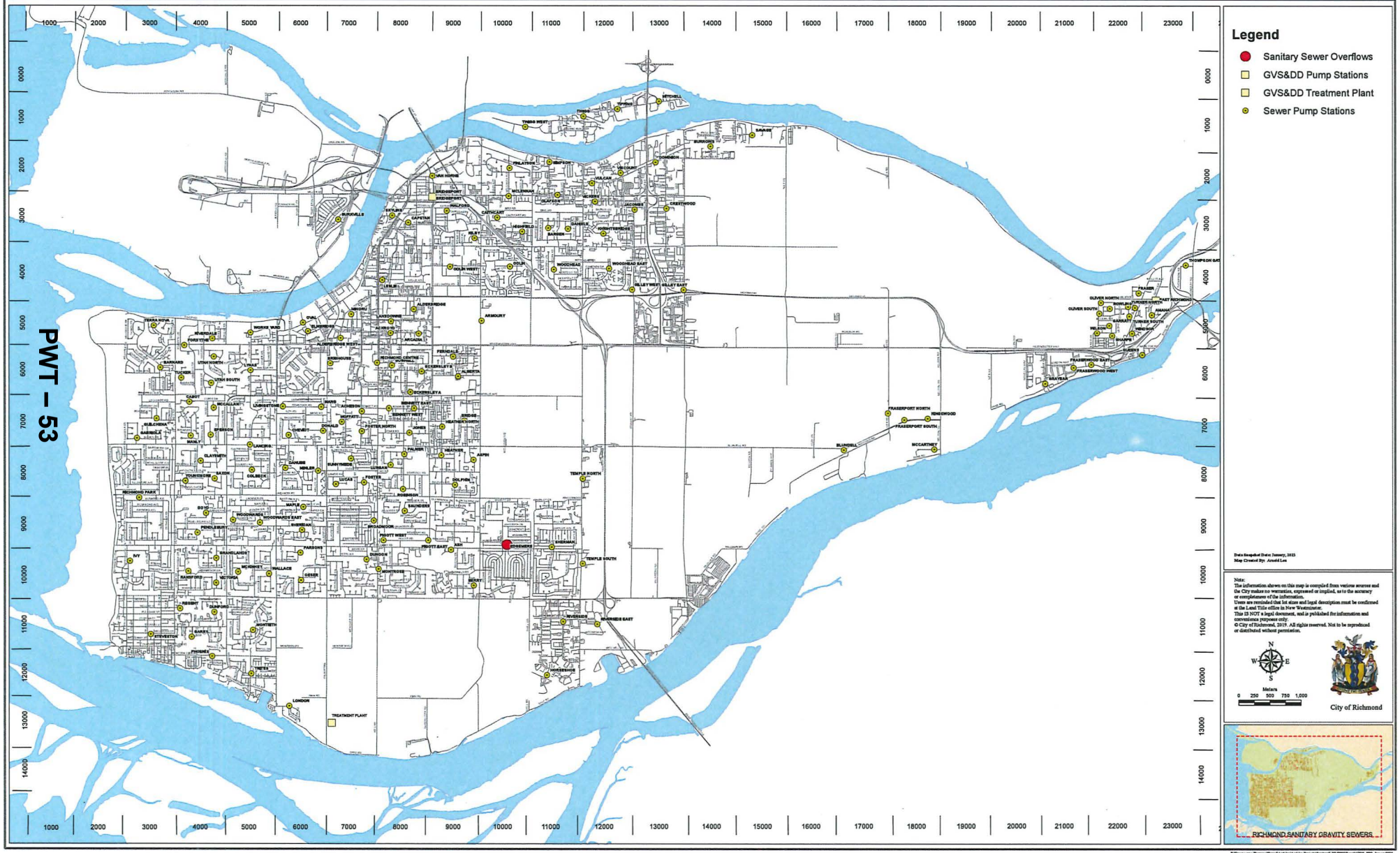
ATTACHMENT 3

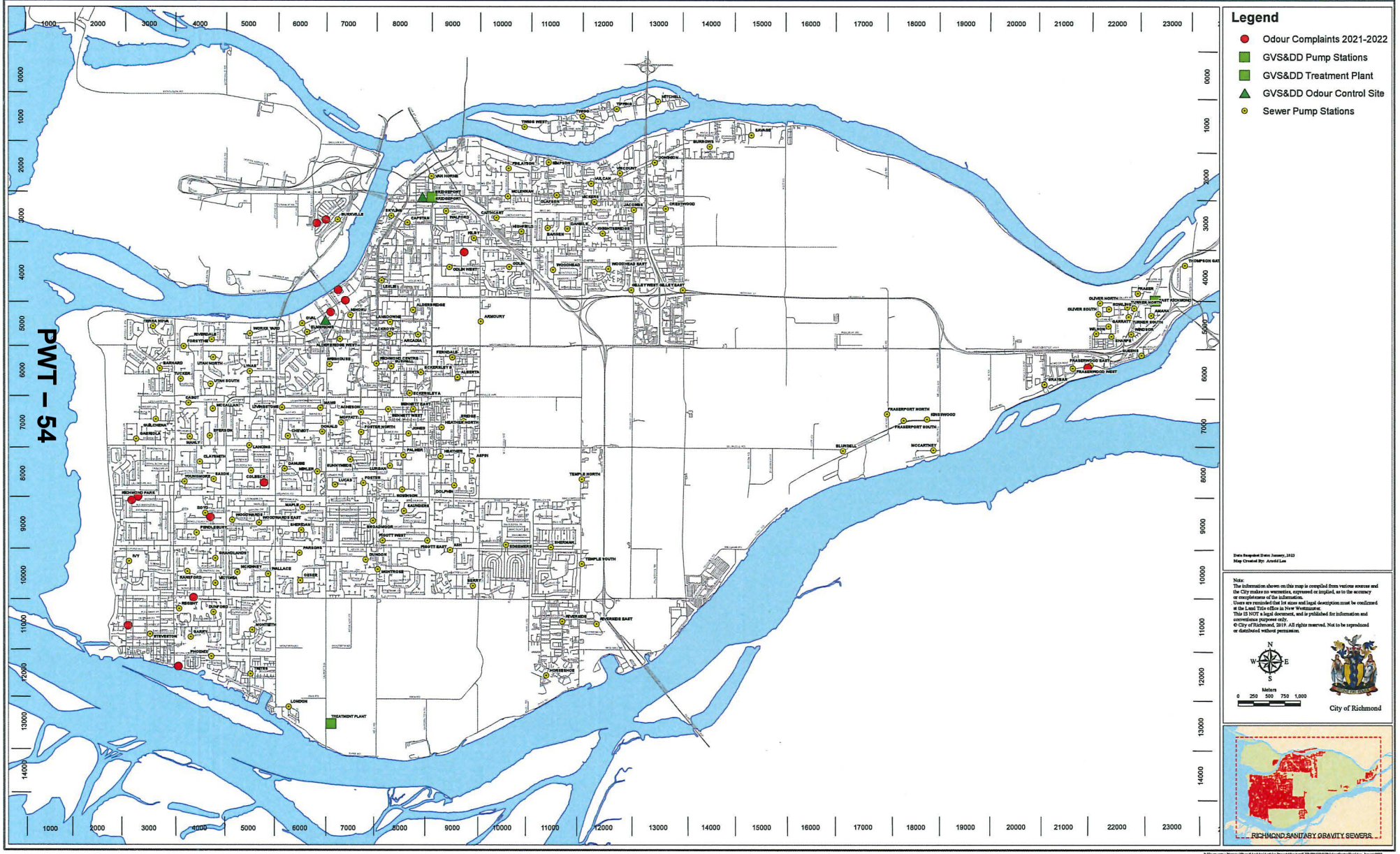
City of Richmond Sanitary Sewer Overflows (SSO) 2021-2022 Reporting Period - January 2023



PWT – 53

ATTACHMENT 4

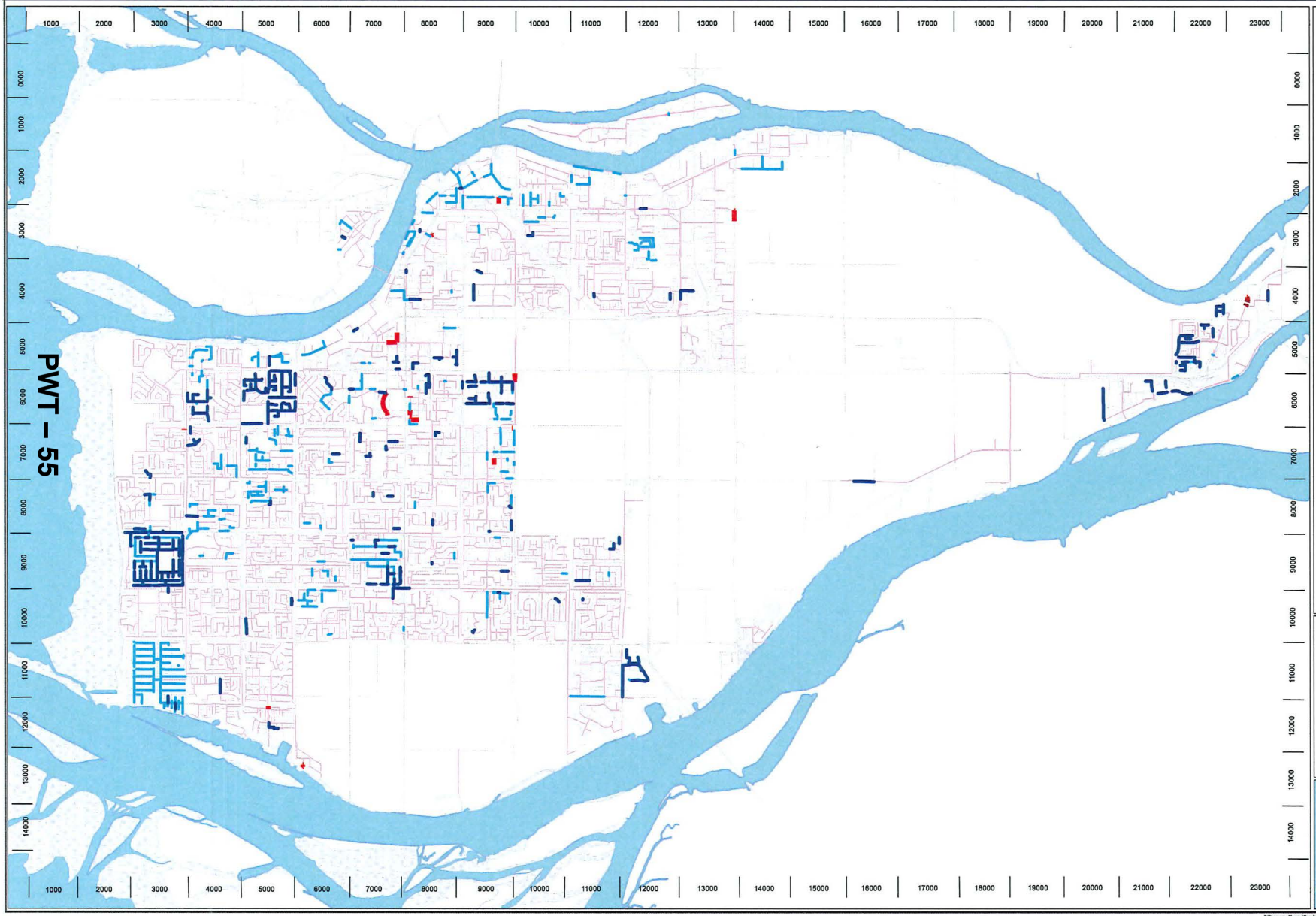
City of Richmond Odour Control Facilities At Sanitary Pump Stations - January 2023



PWT – 54

ATTACHMENT 5

City of Richmond Sanitary Sewer Assessement, Replacement & Rehabilitation January 2023



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Legend

- CCTV 2021-2022
- CCTV 2016-2020

Sanitary Infrastructure

2021-2022 Replacement & Rehabilitation

- Forcemain
- Gravity Main
- Existing Sanitary System

Data Snapshot Date: January, 2023
Map Created By: Arnold Lai

Note:
The information shown on this map is compiled from various sources and the City makes no warranties, expressed or implied, as to the accuracy or completeness of the information.
Users are reminded that lot sizes and legal description must be confirmed at the Land Title office in New Westminster.
This IS NOT a legal document, and is published for information and convenience purposes only.

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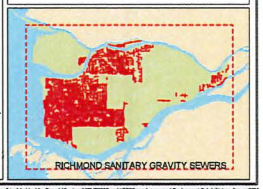
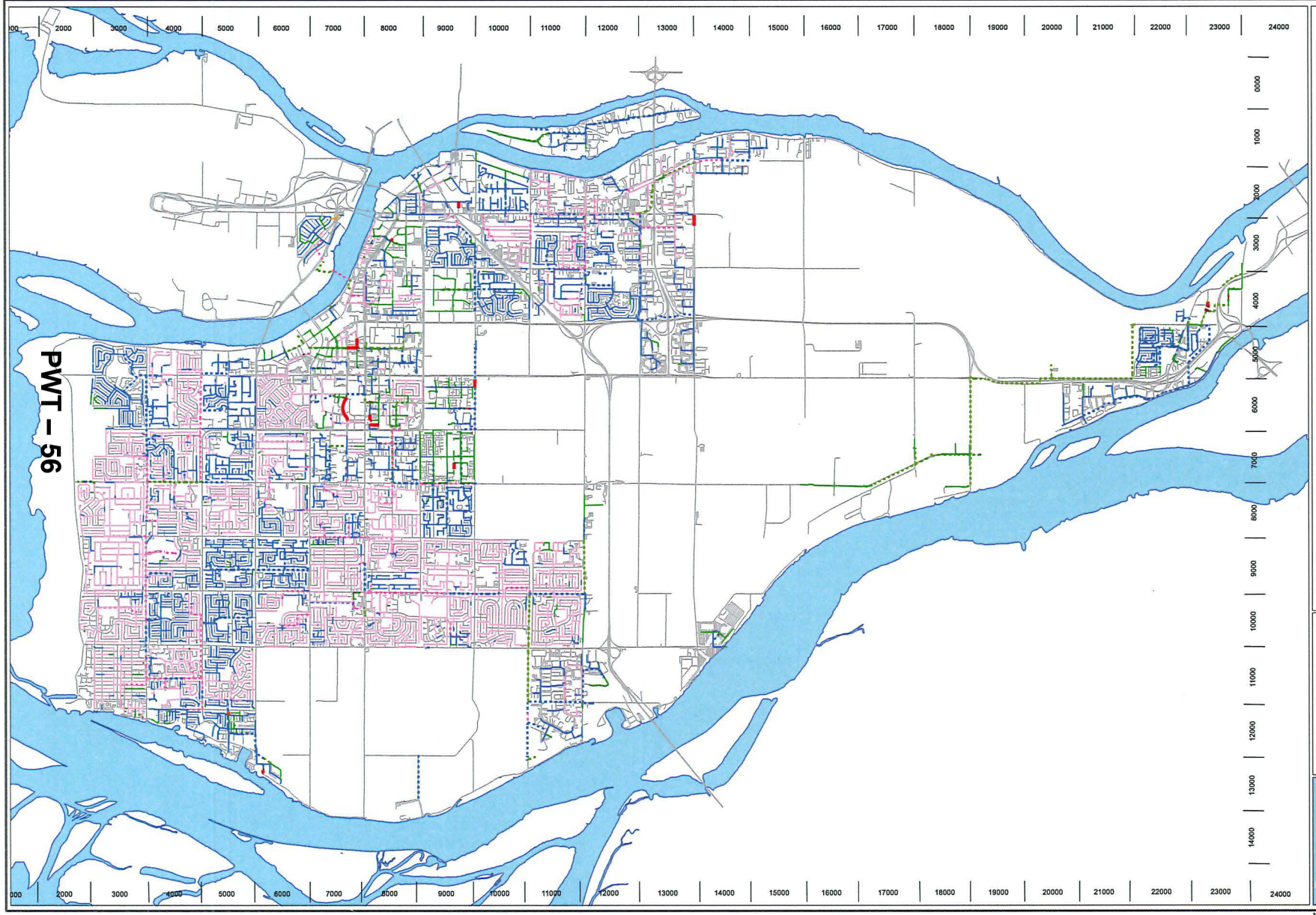
City of Richmond



ATTACHMENT 6

City of Richmond Sanitary System Age - January 2023



PWT – 56

Legend

Sanitary Lines

2021-2022 Mains

- Forcemain
- Main

Gravity Mains

Average Install Year

- <1950
- 1950 - 1975
- 1976 - 2000
- >2001

Forcemains

Average Install Year

- 1967 - 1975
- 1976 - 2000
- >2001

Data Snapshot Date: January, 2023
Map Created By: Arnold Lee

Note:
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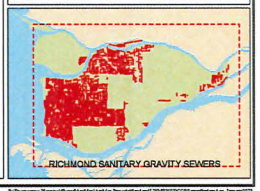
City of Richmond



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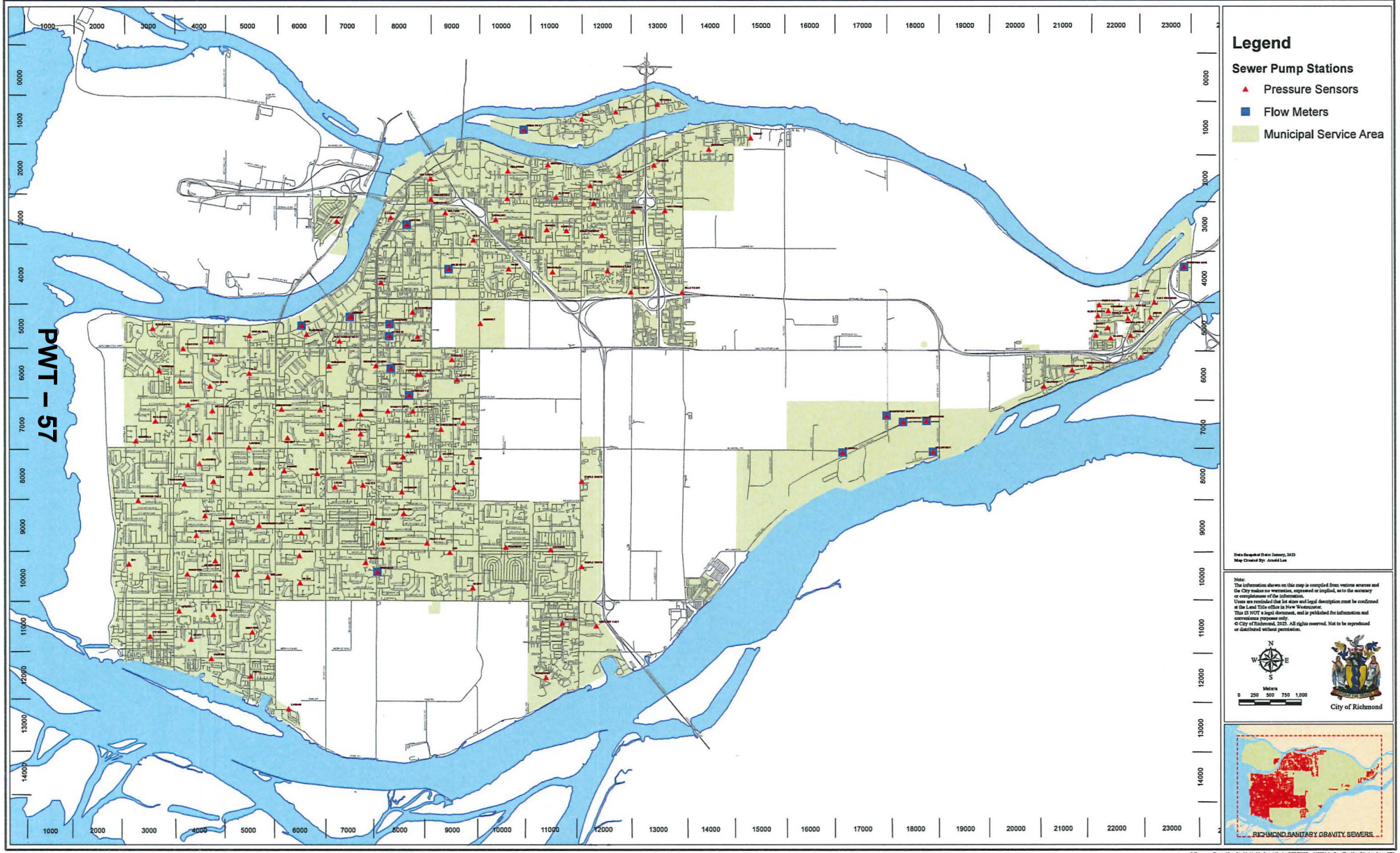
ATTACHMENT 8

City of Richmond Active Sewer Flow & Level Monitors - January 2023



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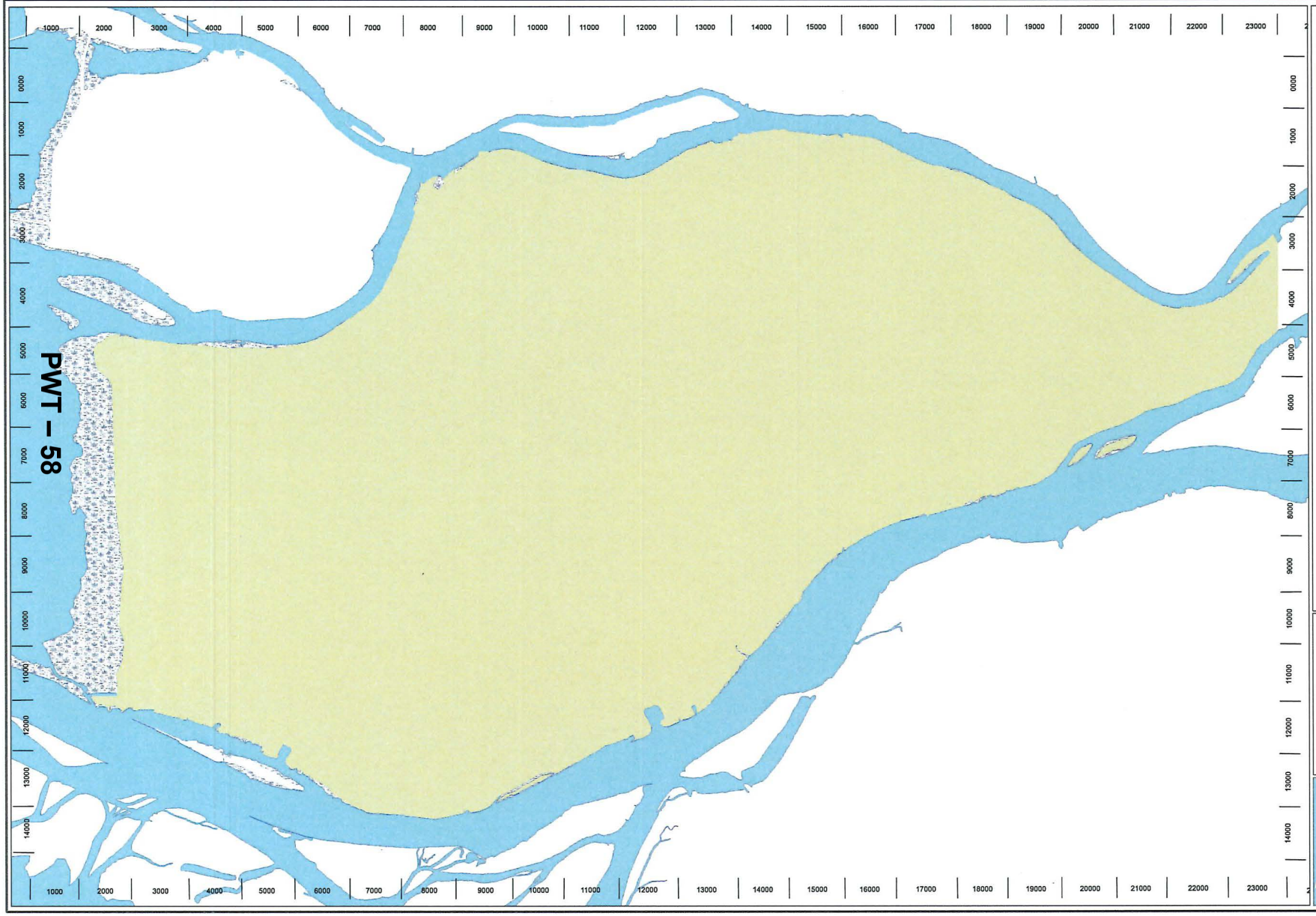
ATTACHMENT 10

Richmond Integrated Stormwater Management Plan (ISMP) Status Map - January 2023



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Implementation Phase

NOTE:
Richmond is developing one ISMP for the entire City that will meet the Liquid Waste Management Plan (LWMP) requirements.

Data Snapshot Date: January, 2023
Map Created By: Arnold Lee

Note:
The information shown on this map is compiled from various sources and the City makes no warranties, expressed or implied, as to the accuracy or completeness of the information.
Users are reminded that lot sizes and legal description must be confirmed at the Land Title office in New Westminster.
This IS NOT a legal document, and is published for information and convenience purposes only.

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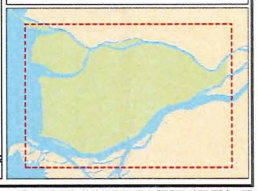
City of Richmond



City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	January 24, 2023
From:	Milton Chan, P.Eng. Director, Engineering	**File:**	10-6060-01/2023-Vol 01
Re:	**UBCM Community Emergency Preparedness Fund: 2022/23 Disaster Risk Reduction – Climate Adaptation Grant Application**		

Staff Recommendation

1. That the application to the Community Emergency Preparedness Fund, Disaster Risk Reduction – Climate Adaptation funding stream as outlined in the staff report titled "UBCM Community Emergency Preparedness Fund: 2022/23 Disaster Risk Reduction – Climate Adaptation Grant Application" dated January 24, 2023 from the Director, Engineering be endorsed;

2. That should the grant application be successful, the Chief Administrative Officer and the General Manager, Engineering and Public Works, be authorized on behalf of the City to negotiate and execute funding agreements with UBCM for the above mentioned projects; and

3. That should the grant application be successful, capital projects of $150,000 for Seepage Assessment and Management Strategy, $150,000 for Flood Protection Monitoring Stations, and $2,000,000 for No. 3 Road Canal Improvements be approved with funding from external grant, as outlined in the staff report titled "UBCM Community Emergency Preparedness Fund: 2022/23 Disaster Risk Reduction – Climate Adaptation Grant Application" dated January 24, 2023 from the Director, Engineering, and that the Consolidated 5-Year Financial Plan (2023-2027) be amended accordingly.

Milton Chan, P.Eng.
Director, Engineering
(604-276-4377)

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Intergovernmental Relations	☑	
Finance	☑	
Public Works	☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:**	**APPROVED BY CAO**

Staff Report

Origin

The Community Emergency Preparedness Fund (CEPF) is a collection of funding programs intended to enhance the resilience of communities in responding to emergencies. The Disaster Risk Reduction – Climate Adaptation funding stream through the CEPF is currently accepting applications until February 24, 2023 for projects that are aimed at reducing risks from future disasters due to natural hazards and climate-related risks. This report responds to this grant opportunity.

This grant application requires a Council resolution indicating support for the proposed projects, as well as a willingness to provide overall grant management. The purpose of this report is to seek Council approval to submit a grant application to the 2022/23 UBCM Disaster Risk Reduction – Climate Adaptation funding stream.

This report supports the following strategies within Council's Strategic Plan 2018-2022:

Strategy #1 A Safe and Resilient City:

> *Enhance and protect the safety and well-being of Richmond.*
>
> *1.2 Future-proof and maintain city infrastructure to keep the community safe.*

Strategy #5 Sound Financial Management:

> *Accountable, transparent, and responsible financial management that supports the needs of the community into the future.*
>
> *5.1 Maintain a strong and robust financial position.*
>
> *5.4 Work cooperatively and respectfully with all levels of government and stakeholders while advocating for the best interests of Richmond.*

Analysis

Richmond continues to make investments in its extensive network of flood protection infrastructure, which is integral to protecting the health, safety, and economic viability of the City. Predicted climate change impacts on local weather patterns and sea level rise reinforce the need for continual upgrades to our flood protection infrastructure to address changing needs. The City's Flood Protection Management Strategy and Dike Master Plans are the guiding framework for the advancement of flood protection upgrades. The Flood Protection Management Strategy identifies senior government partnerships as a top priority.

Community Emergency Preparedness Fund

Funding for the CEPF is provided by the Province of BC and is administered by the Union of BC Municipalities (UBCM). The Disaster Risk Reduction – Climate Adaptation funding stream is a part of the CEPF and is intended to support communities in reducing the risk of future disasters due to natural hazards and climate-related risks. This funding stream is comprised of three separate project categories that will be evaluated and awarded individually. Staff have identified projects that would

be appropriate for each category, as summarized in Table 1. The fund can contribute 100% of the cost of eligible activities up to a maximum amount. Projects must be completed within two years of notification of funding approval to be eligible for grant funding.

Table 1 – Proposed Projects for Disaster Risk Reduction – Climate Adaptation Fund Application

Funding Category	**Grant Maximum**	**Proposed Project**
Category 1: Foundational activities (risk mapping, risk assessments, planning)	$150,000	Seepage Assessment and Management Strategy
Category 2: Non-structural activities	$150,000	Flood Protection Monitoring Stations
Category 3: Small scale structural activities	$2 million	No. 3 Road Canal Improvement

The Seepage Assessment and Management Strategy project will assess the impacts of seepage related to sea level rise and develop strategies to mitigate the potential impacts on Richmond's flood protection infrastructure. This project will support long-term climate adaptation planning and recommendations for future work related to flood protection.

The Flood Protection Monitoring Stations project involves upgrading and installing river level sensors, box culvert level sensors and canal level sensors to monitor the performance of the City's flood protection infrastructure. The proposed sensors will supplement the City's current inventory of flood protection level sensors, which help identify areas of concern during significant events, improve reliability and decrease the cost and disruption of unplanned maintenance and emergency repairs. This is a cost effective way to increase the City's ability to prepare for, respond to, and predict extreme climate events.

The No. 3 Road Canal Improvement project involves upgrades along the No. 3 Road canal south of Steveston Highway to increase conveyance capacity. The No. 3 Road drainage catchment had been identified in significant rain events as requiring drainage upgrades. This project will support the newly constructed No. 3 Road and Steveston Highway drainage pump station to improve drainage within the No. 3 Road drainage catchment and reduce local flood risks due to drainage ditch blockages, safety issues, and environmental disturbance.

Financial Impact

Should the City be awarded the grant, staff recommend that the capital projects as outlined in Table 2, be approved and that the Consolidated 5 Year Financial Plan (2023-2027) be amended accordingly. The estimated operating budget impact (OBI) identified in Table 2 will be considered as part of the annual budget process.

Table 2 – Proposed Capital Projects should the City's Grant Application be Successful

Project	Budget	OBI
Seepage Assessment and Management Strategy	$150,000	$0
Flood Protection Monitoring Stations	$150,000	16,958
No. 3 Road Canal Improvement	$2,000,000	$0

If the City's grant application is unsuccessful, staff will submit the capital projects for Council's consideration through future budget processes.

Conclusion

Grant funding opportunities are available through the CEPF to support municipalities and communities in reducing the risk of future disasters due to natural hazards and climate-related risks. Staff recommend that applications be submitted for the Seepage Assessment and Management Strategy, Drainage System Sensor Installation, and No. 3 Rd Canal Improvement projects. These projects align with the grant program guidelines and support the City's Flood Protection Management Strategy.

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