

Notice of Meeting and Meeting Agenda Regional Water Supply Commission

Friday, March 1, 2024	9:00 AM	6th Floor Boardroom
		625 Fisgard St.
		Victoria, BC V8W 1R7

Special Meeting

MEMBERS:

G. Baird (Chair); K. Harper (Vice Chair); J. Caradonna; N. Chambers; C. Coleman;

Z. de Vries; S. Duncan; C. Graham; S. Gray; C. Green; K. Guiry; S. Hammond;

- K. Jordison; S. Kim; D. Lajeunesse; T. Morrison; T. Phelps Bondaroff;
- J. Rogers; C. Stock; M. Wagner; M. Westhaver; A. Wickheim

1. TERRITORIAL ACKNOWLEDGEMENT

2. APPROVAL OF THE AGENDA

3. PRESENTATIONS/DELEGATIONS

- 3.1 Presentations
- **3.1.1** 24-241
 Dr. Benusic, Island Health: Re: Item 4.2 Correspondence: Island Health: Filtration of Greater Victoria Water Supply System, February 6, 2024

 Recommendation:
 There is no recommendation. The presentation is for information only.

 Attachments:
 Presentation: Water Filtration Island Health
- 3.2 Delegations

4. SPECIAL MEETING BUSINESS

4.1 <u>24-216</u> Regional Water Supply 2022 Master Plan Overview and Status Update

Recommendation: There is no recommendation. The presentation is for information only.

Attachments: 2022 Master Plan Overview & Status Update

 4.2
 24-217
 Correspondence: Island Health: Filtration of Greater Victoria Water Supply System, February 6, 2024

 Recommendation:
 There is no recommendation. The correspondence is for information only.

Attachments: Correspondence: Island Health, Filtration of Greater Victoria Water Supply Syste

5. ADJOURNMENT

Filtration of Greater Victoria Water Supply System

Mike Benusic, Medical Health Officer Special Meeting, Regional Water Supply Commission 1 March 2024



islandhealth.ca

• Roles & responsibilities

• Drinking water treatment objectives & filtration exemption

• Future of Greater Victoria Water Supply System

• Requirements & recommendations



DRINKING WATER PROTECTION ACT [SBC 2001] CHAPTER 9

Drinking water officers

3 (1) Unless another person is appointed under subsection (2), the drinking water officer for an area is

(a) the person appointed by the medical health officer as the drinking water officer, or

(b) if no appointment is made under paragraph (a), the medical health officer.

(2) The minister may, by order, appoint persons, by name or by title, as drinking water officers and establish the area of their jurisdiction.

(3) In determining the qualifications for appointments under subsection (2), the minister must consult with the Provincial health officer.

(4) Subject to the regulations, a drinking water officer may, in writing, delegate to any person a power or duty of the drinking water officer under this or another enactment.

Water supply systems must provide potable water

6 Subject to the regulations, a water supplier must provide, to the users served by its water supply system, drinking water from the water supply system that

(a) is potable water, and

(b) meets any additional requirements established by the regulations or by its operating permit.

Operating permits and requirements for water supply systems

8 (1) In the case of a prescribed water supply system, the water supplier

(a) must not operate the water supply system unless the water supplier holds a valid operating permit issued in accordance with the regulations,

(b) must comply with all terms and conditions of its operating permit, and

(c) must operate the water supply system in accordance with any applicable regulations.

(2) An issuing official may include in an operating permit terms and conditions the official considers advisable respecting the water supply system.

(3) As examples, but without limiting the authority under this section, terms and conditions respecting the following may be included in an operating permit:

(a) treatment requirements;

(b) equipment, works, facilities and operating requirements;

(c) qualifications and training of the persons operating, maintaining or repairing the water supply system;

(d) monitoring of the drinking water source and the water in the water supply system;

(e) standards applicable to the water in the water supply system;

(f) reporting and publication of monitoring results or other information respecting the water supply system.

(4) The drinking water officer or an issuing official may change the terms and conditions of an operating permit if the officer or issuing official considers this advisable, but must first consult with the water supplier respecting the proposed changes and must consider any comments of the water supplier in response.



PUBLIC HEALTH ACT [SBC 2008] CHAPTER 28

(3) A medical health officer must advise, in an independent manner, authorities and local governments within the designated area

- (a) on public health issues, including health promotion and health protection,
- (b) on bylaws, policies and practices respecting those issues, and
- (c) on any matter arising from the exercise of the medical health officer's powers or performance of the medical health officer's duties under this or any other enactment.

https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/08028_01#section70



A WATER SUPPLY SYSTEM

Water System Name:	CAPITAL REGIONAL DISTRICT GREATER VICTORIA DRINKING WATER SYSTEM, JAPAN GULCH PLANT SERVICE AREA
Premises Number:	6030391
Premises Address:	3195 Niagara Main Road Victoria, BC V9B 1H7
Water System Owner:	Capital Regional District

Capital Regional District is hereby permitted to operate the above potable water supply system and is required to operate this system in accordance with the Drinking Water Protection Act and in accordance with the conditions set out in this operating permit and conditions established as part of any construction permit.

The water supply system for which this operating permit applies is generally described as:

Service Delivery Area:	Greater Victoria Municipalities except Sooke and East Sooke
Source Water:	Sooke Lake Reservoir and Goldstream System Reservoirs
Water Treatment methods are:	None (Exemption provided by MHO)
Water Disinfection methods are:	Ultraviolet, chlorination and chloramination

> 20,000 Connections - DWP

Number of Connections

Operating conditions specific to this water supply system are in Appendix A.

Date: April 2, 2013

Issued By:

Rory Beise, Environmental Health Officer

APPENDIX A

WATER SYSTEM OPERATING CONDITIONS FOR

CAPITAL REGIONAL DISTRICT GREATER VICTORIA DRINKING WATER SYSTEM, JAPAN GULCH PLANT SERVICE AREA

3195 Niagara Main Road

Victoria, BC, V9B 1H7

Provide continuous monitoring of turbidity and dual disinfection processes to ensure compliance with VIHA's 4321 standards for Surface Water Treatment.

April 2, 2013 Effective Date

Environmental Health Officer



Drinking Water Officers' Guide

Consolidated Version

March 23 2023

Ministry of Health



Drinking water officials must consider this Guide in the exercise of their duties and discretion. They are, however, able to depart from the Guide in any case where sound reason exists to do so (as discussed further below).



Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia

Version 1.2 / First Published November 2012

Ministry of Health

4. Treatment Objectives

These objectives provide treatment requirements that address the following microbiological parameters: enteric viruses, pathogenic bacteria, *Giardia* cysts and *Cryptosporidium* oocysts. The general objectives are as follows and described in more detail below:

- 4-log reduction or inactivation of viruses.
- 3-log reduction or inactivation of Giardia and Cryptosporidium.
- Two treatment processes for surface water.
- Less than or equal to (≤) one nephelometric turbidity unit (NTU) of turbidity.
- No detectable E. Coli, fecal coliform and total coliform.

As most disinfection systems require clear water to ensure maximum efficiency, it may be necessary to combine multiple specific treatment technologies. To provide the most effective protection, the *Guidelines for Canadian Drinking Water Quality* recommend that filtration and one form of disinfection be used to meet the treatment objectives.

Alternatively, two forms of disinfection (for example, chlorination and UV disinfection) may be considered if certain criteria are met.



Filtration Exemption

A water supply system may be permitted to operate without filtration if the following conditions for exemption of filtration are met, or a timetable to implement filtration has been agreed to by the drinking water officer:

- 1. Overall inactivation is met using a minimum of two disinfections, providing 4-log reduction of viruses and 3-log reduction of *Cryptosporidium* and *Giardia*.
- 2. The number of *E. coli* in raw water does not exceed 20/100 mL (or if *E. coli* data are not available less than 100/100 mL of total coliform) in at least 90% of the weekly samples from the previous six months. Treatment target for all water systems is to contain no detectable *E. coli* or fecal coliform per 100 ml. Total coliform objectives are also zero based on one sample in a 30-day period. For more than one sample in a 30-day period, at least 90% of the samples should have no detectable total coliform bacteria per 100 ml and no sample should have more than 10 total coliform bacteria per 100 ml.
- Average daily turbidity levels measured at equal intervals (at least every four hours) immediately before the disinfectant is applied are around 1 NTU, but do not exceed 5 NTU for more than two days in a 12-month period.
- 4. A watershed control program is maintained that minimizes the potential for fecal contamination in the source water. (Health Canada, 2012b)



Applying the filtration exemption criteria does not mean filtration will never be needed in the future. A consistent supply of good source water quality is critical to the approach, but source quality can change. Therefore, the exemption of filtration must be supported by continuous assessment of water supply conditions.

Changing source water quality can occur with changes in watershed conditions. Increased threats identified through ongoing assessment and monitoring may necessitate filtration. Maintaining the exemption condition relies on known current and historic source water conditions, and provides some level of assurance to water suppliers that a filtration system may not be necessary unless the risk of adverse source water quality increases.





Leech River Watershed

Water Quality Analysis Report

Table 31 Summary Statistics for Physiochemical Parameters at LR-US-WLR

Parameter	Min	Max	Mean*	Median*	Unit	Sample Size (N)	Water Quality Threshold (WQTH)	% N Exceeding WQTH
Alkalinity	2.84	16.6	6.68	5.18	mg/L	18	N/A	N/A
Conductivity	15.6	108.0	35.78	24.05	μS/cm	18	N/A	N/A
Hardness	4.22	26.70	8.72	6.14	mg/L	19	N/A	N/A
DO	10.55	15.34	12.66	12.66	mg/L	43	N/A	N/A
FPH	6.00	7.80	6.71	6.70	N/A	45	[7.0-10.5] (AO)	78
True Colour	3.0	67.0	20.2	17.5	TCU	55	≤ 15 (AO)	58
Turbidity (Manual)	0.15	3.6	0.40	0.25	NTU	29	≤ 1.0 (MAC)	3
Turbidity (Sensor)	0.00	1571.6	1.31	0.70	NTU	86657	≤ 1.0 (MAC)	25
Water Temp.	1.40	12.90	7.29	6.85	°C	58	≤ 15	0

require filtration of the Greater Victoria Water Supply System if the Leech River is introduced



2021 RWS Service - Supply System Risk and Resilience Study -

Short duration, high intensity rainfall events are projected to increase in both frequency and severity in the future. Depending on a storm's return period and duration, discrete storm events are expected to increase in intensity by approximately 13% to 52% in the eastern portion of the CRD and by 13% to 42% in the western portion of the CRD.

With increased water volumes during and following high intensity rainfall events, there will also be increases in the movement of sediments, organic materials, and associated nutrients carried into water supply reservoirs by streams and adjacent slope failures. Increased turbidity levels could impact disinfection processes at water treatment plants, affecting water quality or chemical dosing.

Landslides ultimately pose an issue to water quality by increasing the quantity of suspended solids and organic material in the source water.

Increased algal blooms or populations of invasive species will require CRD to consider pre-treatment and filtration requirements for water along with increased complaints or concerns for water quality due to colour, taste and odour, as well as clogging of household water filters at the point of consumption. Excess biological material can also introduce potentially harmful toxins (e.g., cyanotoxins).





Exposure / probability

recommend filtration of the Greater Victoria Water Supply System



Conclusions: Greater Victoria Water Supply System

- Filtration exemption is currently appropriate
- Recommend planning for filtration in advance of increasing risk of turbidity-causing events
- Require filtration if the Leech River is introduced



Regional Water Supply 2022 Master Plan

Regional Water Supply Commission Overview & Status Update March 1, 2024





Territorial Acknowledgement

The CRD conducts its business within the traditional territories of many First Nations, including but not limited to BOKECEN (Pauquachin), MÁLEXEŁ (Malahat), Pacheedaht, Pune'laxutth' (Penelekut), Sc'ianew (Beecher Bay), Songhees, STÁUTW (Tsawout), T'Sou-ke, WJOŁEŁP (Tsartlip), WSIKEM (Tseycum), and x^wseps_{>m} (Esquimalt), all of whom have a long standing relationship with the land and waters from time immemorial that continues to this day.





Agenda

- 1. Background
- 2. Master Planning Methodology
- 3. Demand Forecasts
- 4. Master Plan Project Overview
- 5. Financial Implications
- 6. Public & First Nation Engagement
- 7. Progress Update



Evolution of the Regional Water Supply System







Key Projects Completed Since 1994

- Rehabilitate Goldstream Reservoirs/Dams
- UV Disinfection
- Raise Sooke Lake Reservoir Dam
- District of Sooke supply and treatment (replace Charters Treatment Plant) – Transmission Main #15 & SRRDF
- Replace Transmission Main #1

Other Recommended Considerations in 1994

- Filtration
- Sooke Lake Deep Northern Intake
- Leech River diversion
- Second major transmission system from Sooke Lake Reservoir
- Additional balancing storage

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Strategic Plan

Are tools that provide guidance in fulfilling a utility's mission and commitments and includes specific goals and actions to achieve the mission. *"Where we want to go"*



Master Plan

Road map that documents medium and long-term plans for major infrastructure projects, provides a description of significant capital improvements and framework for decision making *"How do we get there"*



Capital Plan

Documents short term projects with defined scope, schedule and budget. Typically includes new and replacement machinery, structures, transmission networks etc. *What we are doing*"



Operational Plan

Detailed plans specific to different work areas that define casks and associated roles and responsibilities, typically nternal documents. *"How we work"*

Master Planning

- Creation is a best management practice
- Considers how various complex but interrelated issues can be addressed in a holistic manner over many years resulting in a longer-term vision of infrastructure investments
- It does not document all activities undertaken by a utility but focuses on long range **infrastructure requirements** for existing and future service needs.
- Ensures scope of earlier projects can be informed by future project requirements
- Considers alternatives and scopes projects to conceptual level with Class D Cost Estimates
- Provides inputs/projects in future years Capital Plans



2017 Strategic Plan Commitments and Focus Areas



COMMITMENT: Provide high quality, safe drinking water



COMMITMENT: Provide an adequate, long-term supply of drinking water



COMMITMENT: Provide a reliable and efficient drinking water transmission system



CRD BOARD PRIORITIES -SUSTAINABLE AND LIVABLE REGION



DEMAND MANAGEMENT -ADDRESSING CHANGING TRENDS IN WATER DEMAND



SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE



CLIMATE CHANGE IMPACTS -MITIGATION AND ADAPTATION



PLANNING FOR THE FUTURE USE OF THE LEECH WATER SUPPLY AREA



PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY





8



Capital Regional District | Regional Water Supply 2022 Master Plan

MAY 2022

Stantec

Making a difference...together

CDD

Total Annual & Summer Demands 2020 to 2100



Population growth rates (%) - (low/medium/high)

CDD

Sooke Lake Reservoir – Demand Scenarios

Simulated water level in Sooke Lake Reservoir for a 1:50 dry precipitation year followed by an average precipitation year with different demand scenarios

CDD

COMMITMENT: Provide high quality, safe drinking water

Goldstream Water Filtration Plant (T2/T4/M2)

Estimated Cost: \$1.07 Billion

A direct filtration plant located upstream of the Goldstream Disinfection Facility to better protect the Regional Water Supply from potential raw water quality fluctuations due to climate change, forest fires and the eventual integration of water from the Leech and Goldstream Water Supply Areas. The project includes a pump station, clearwell, balancing tank and the decommissioning of the Japan Gulch Dam and Reservoir.

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

CLIMATE CHANGE IMPACTS -MITIGATION AND ADAPTATION

COMMITMENT:

Provide an adequate, long-term supply of drinking water

Deep Northern Intake Floating Pump Station (S3) and Transmission Main to Head Tank (M3)

Estimated Cost: \$135.41 Million

A second intake and raw water transmission main pumped to the Head Tank to add redundancy to the existing single southern intake, allow access to deeper, high-quality water and allow for further drawdown of the Sooke Lake Reservoir to increase supply.

PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

Sooke Basin Profile

Leech River Diversion (S4/RWT1) and Sooke Lake Saddle Dam Hydraulic Upgrades (M1)

Estimated Cost: \$41.9 Million

An intake structure to divert Leech River water through the existing Leech Tunnel to Deception Gulch Reservoir as a supplemental source to Sooke Lake Reservoir.

Sooke Lake Saddle Dam and Deception Gulch Dam will both require upgrades to transfer water from Deception Gulch Reservoir to Sooke Lake Reservoir

PLANNING FOR THE FUTURE USE OF THE LEECH WATER SUPPLY AREA

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

COMMITMENT:

Provide a reliable and efficient drinking water transmission system

East – West Connector (M12)

Estimated Cost: \$77.64 Million

A transmission main to connect the proposed Filtration Plant with the Juan de Fuca Water Distribution Service.

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

Smith Hill Tank and Pump Station (M13/M14)

Estimated Cost: \$41.75 Million

A storage tank and associated pump station at the existing, decommissioned Smith Hill site to provide numerous benefits including emergency storage, balancing of instantaneous/peak demands, reduce the capacity required at treatment plants, reduce risk of transient pressure surges, reduce head losses and deferral of transmission main hydraulic upgrade.

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

Third Main: Sooke Lake Dam to Head Tank (M4)

Estimated Cost: \$9.13 Million

A third raw water main extending between the Sooke Lake Dam and the Head Tank to increase capacity, improve redundancy and ensure service continuation in the event of a natural disaster or failure.

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY

2023-2024	2025-2029	2030-2033
Planning	Design	Construction

Goldstream Reservoir Connector (M5) Including Stage 1 Balancing Tank (M6)

Estimated Cost: \$89.82 Million

A piped connection between Goldstream Lake Reservoir and the proposed Goldstream Treatment Plant to protect the water quality of the secondary water supply for use during emergencies, Kapoor Tunnel shut down, and eventually allow Kapoor Tunnel redundancy and increased raw water transmission capacity.

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY

2023-2024	2025-2029	2036-2039
Planning	Design	Construction

Jack Lake Raw Water Transmission Main (RWT5)

Estimated Cost: \$284.96 Million

A piped connection between the existing Head Tank and Goldstream Treatment Plant to provide redundancy to the Kapoor Tunnel for backup or emergency purposes and increased raw water transmission capacity.

PREPARING FOR EMERGENCY AND POST-DISASTER WATER SUPPLY

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE

2027-2050

Annual Program

Treated Water Transmission Main Upgrades (Phases 1-4.2 M7, M8, M9, M10, M11)

Estimated Cost: \$295.42 Million

A variety of renewal and capacity-related transmission system upgrades throughout the Regional Water Supply (RWS) aligned into a \$10M/year re-occurring annual program.

SUPPLY SYSTEM INFRASTRUCTURE INVESTMENT - RENEWING EXISTING AND PREPARING FOR NEW INFRASTRUCTURE \bigcirc

DEMAND MANAGEMENT -ADDRESSING CHANGING TRENDS IN WATER DEMAND

2022 Master Plan Financial Implications

- Capital and operating costs
- Funding debt financing and cash contributions
- Financial health of Regional Water Supply Service
- Future water rates

RWS Service Conceptual Operating, Capital Cost & Rate Model

2022 Public & First Nation Engagement

Get Involved	 The Get Involved Engagement Platform launched & open for public feedback June 9 - July 6 753 page visits broken down as follows: 383 people visited at least one page of the platform 157 people visited multiple pages and downloaded documents the most popular document being the Executive Summary 22 people emailed questions or shared comments
Media	 A media release was issued on June 9, 2022 – the release highlighted the individual proposed projects within the Master Plan , why they are needed and how the public could provide feedback on the proposed Master Plan Local media including CTV, CBC, CFAX and the Sooke Mirror Newspaper also covered the Master Plan media release and Get Involved Platform
Social Media	 Social media posts were created to promote the Master Plan "Get Involved" platform which invited the public to provide feedback via the platform Facebook posts reached 12,352 users with 382 link clicks to the Master Plan engagement platform Twitter posts were seen by 837 users with 32 link clicks to the Master Plan engagement platform
First Nations	 Impacted First Nations were emailed a personal letter from the General Manager of Integrated Water Services on June 10, 2022, asking the Nations to participate in a specifically designed First Nations online presentation of the Master Plan to be held on June 16, 2022 The letter to First Nations also provided alternate options for providing feedback including personal phone calls with General Manager

Future Public and First Nation Engagement

Get Involved	• The Get Involved Engagement Platform will be refreshed and allow for public engagement on individual projects within the Master Plan as planning for each project begins
Media	• The CRD will follow its standard media communication as the Master Plan evolves which includes creating a series of media releases, interviews with local TV and radio stations and collaborations with local newspapers to amplify messaging
Social Media	• The CRD will follow its standard social media engagement strategies and communicate about future Master Plan engagement opportunities via Facebook and X (Twitter)
First Nations	 First Nations will be engaged to better understand their interests in the Master Plan and related projects, as requested and through on- going government to government meetings. Feedback from First Nations will inform the implementation of the Master Plan and the engagement plan for the specific projects.

Progress Updates

- 1. Commenced Water Quality Sampling for Leech (2019) and Deep Northern Intake (2023)
- 2. M7 Increase hydraulic grade line of Main No. 1 from 116m to 169m & Watkiss PCS Upgrades
 - Consulting assignment awarded in Q4 of 2023.
 - Currently in the preliminary design stage. Project is expected to be ready for construction in 2025.
- 3. M8 replacing sections of the concrete pipe sections from Niagara Main (near Goldstream Disinfection Facility) to Goldstream Avenue at Veterans Memorial Parkway.
 - Replacement of an approximately 2.0 km section concrete pressure pipe along this main has been prioritized for replacement based on lifespan, pressure rating and reduced seismic resiliency
 - Currently in the preliminary design stage
- 4. Design of Smith Hill reservoir decommissioning underway in 2024.
 - Public engagement to gain feedback on temporary restoration, as needed.

CCD

Questions or Comments

Capital Regional District

Excellent health and care, for everyone, everywhere, every time.

6 February 2024

Alicia Fraser General Manager, Integrated Water Services Capital Regional District

Dear Alicia,

Re: Filtration of Greater Victoria Water Supply System

Thank you for asking Island Health to comment on the Capital Regional District Regional Water Supply 2022 Master Plan, specifically the recommendation to plan for filtration of the Greater Victoria Water Supply System. Please share this letter however you see fit.

Background of roles & responsibilities

Under the <u>BC Drinking Water Protection Act</u>, medical health officers have responsibilities as drinking water officers, and can appoint and delegate responsibilities to other drinking water officers. For Vancouver Island, medical health officers and appointed drinking water officers are employed by Island Health. Additionally, under the <u>BC Public Health Act</u>, medical health officers "must advise, in an independent manner, authorities and local governments within the designated area.... on public health issues".

Under the BC Drinking Water Protection Act "a water supplier must provide, to the users served by its water supply system, drinking water from the water supply system that (a)is potable water, and (b)meets any additional requirements established by the regulations or by its operating permit". The drinking water officer is responsible for issuing operating permits. In reviewing an application for, or reviewing an existing operating permit, drinking water officers must consider guidelines, which are consolidated in the <u>Drinking Water Officers' Guide</u>.

Drinking Water Treatment Objectives & filtration exemption

Within the Drinking Water Officers' Guide is the <u>Drinking Water Treatment Objectives (Microbiological) for</u> <u>Surface Water Supplies in British Columbia</u>. This guidance includes treatment objectives that includes "Two treatment processes for surface water" and states that "To provide the most effective protection, the Guidelines for Canadian Drinking Water Quality recommend that filtration and one form of disinfection be used to meet the treatment objectives."

This section also provides criteria for a filtration exemption, of which is currently included in the operating permit of the Greater Victoria Water Supply System. One of the criteria for filtration exemption in the Drinking Water Treatment Objectives (Microbiological) for Surface Water Supplies in British Columbia is "Average daily turbidity levels measured at equal intervals (at least every four hours) immediately before the disinfectant is applied are around 1 NTU, but do not exceed 5 NTU for more than two days in a 12-month period." Turbidity is an important indicator of water quality as high levels can overwhelm disinfection processes, resulting in inadequately treated water which raises the risk of causing waterborne disease.

Island Health Medical Health Officers

Chief: Dr. Réka Gustafson 250-519-3406 North Island: Dr. Charmaine Enns 250-331-8591 Central Island: 250-739-6304 Cowichan Region: Dr. Shannon Waters 250-737-2020 South Island: Dr. Mike Benusic, Dr. Murray Fyfe, Dr. Dee Hoyano 250-519-3406 islandhealth.ca/about-us/medical-health-officers Excellent health and care, for everyone, everywhere, every time.

Of note, the guide states that "Applying the filtration exemption criteria does not mean filtration will never be needed in the future. A consistent supply of good source water quality is critical to the approach, but source quality can change. Therefore, the exemption of filtration must be supported by continuous assessment of water supply conditions. Changing source water quality can occur with changes in watershed conditions. Increased threats identified through ongoing assessment and monitoring may necessitate filtration. Maintaining the exemption condition relies on known current and historic source water conditions, and provides some level of assurance to water suppliers that a filtration system may not be necessary unless the risk of adverse source water quality increases."

Future of Greater Victoria Water Supply System

The minutes of the 21 February 2001 Capital Regional District Regional Water Supply Commission meeting state that "it has been agreed that filtration will not be required until water is introduced from the Leech River system". The rationale for this is that the current Greater Victoria Water Supply System has historically very low turbidity levels - for example, the 2022 annual report indicates typical turbidity of 0.2-0.4 NTU, with two short term exceedances of 1 NTU with a peak of 3.4. This meets the filtration exemption criteria regarding turbidity.

With the planned introduction of water from the Leech River to increase capacity of the Greater Victoria Water Supply System, there is evidence that this may introduce turbidity-causing particles into the existing Sooke Lake reservoir. The October 2021 Leech River Watershed Water Quality Analysis Report indicated a median turbidity in the West Leech River of 0.70 NTU with 25% of readings exceeding 1 NTU and a peak turbidity of 1571.6, considerably higher than measurements at the Sooke Lake intake of the Greater Victoria Water Supply System. This raises substantial concerns about increasing turbidity of the Greater Victoria Water Supply System, the extent of which may partly depend on how the Leech River water supply is added to the existing system. The impact of a significant turbidity event would be substantial. Without a filtration system to reduce turbidity before disinfection, a boil water notice would be considered to reduce the risk of waterborne disease acquisition. This would have significant implications for everyone relying on the Greater Victoria Water Supply System, including the public, businesses, and healthcare.

The Capital Regional District Regional Water Supply 2022 Master Plan also considers the potential climate change impacts on the Greater Victoria Water Supply System. Increased overall precipitation and wetter storm events raise risk of turbidity events, and increased temperatures raise risk of wildfires which can lead to turbidity events and algae blooms which can lead to algal toxin contamination – both of which would impact drinking water safety and can be mitigated through filtration. These concerns are further explored in the 2021 Regional Water System Risk and Resilience Study which provides evidence that although turbidity events and algal toxin contamination may not be current issues, climate change will increase the risk of these occurring.

Conclusion

From the perspective as drinking water officers, we recommend implementation of filtration in the Greater Victoria Water Supply System in order to ensure a water system resilient to turbidity events.

This is particularly important if the Leech River is used to supplement the existing source. The provision of potable water is required by provincial law, and this would be threatened if turbidity events occur, which appears to be a

Island Health Medical Health Officers

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real risk with the introduction of the Leech River into the Greater Victoria Water Supply System. With the evidence currently available, maintaining the filtration exemption after introduction of the Leech River into the Greater Victoria Water Supply System would not be appropriate and we therefore require filtration of the Greater Victoria Water Supply System if the Leech River is introduced. If there is ambiguity that introduction of the Leech River would result in turbidity events in the Greater Victoria Water Supply System, we would need to see strong evidence to the contrary for a filtration exemption to remain.

Regardless of the addition of the Leech River to the Greater Victoria Water Supply System, we recommend continuing to plan for filtration due to increasing risk of turbidity events. As implementation of filtration takes years of planning and construction, it is prudent to plan now in order to implement before turbidity events occur as these would have substantial impacts on all who rely on the Greater Victoria Water Supply System. At this point of time, maintaining the filtration exemption is appropriate, but this will change if drinking water safety issues occur that could be mitigated by filtration and/or evidence for the risk of adverse source water quality increases.

Sincerely,

Mike Benusic, MD MPH CCFP FRCPC Medical Health Officer Island Health

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Dr. Réka Gustafson, MD MSc MHSc FRCPC Chief Medical Health Officer & Vice President Island Health

CC:

Ted Robbins, Chief Administrative Officer, Capital Regional District Gord Baird, Chair, Regional Water Supply Commission, Capital Regional District Drs. Murray Fyfe & Dee Hoyano, Medical Health Officers, Island Health Gethsemane Luttrell, Director, Health Protection & Healthy Communities, Island Health Cole Diplock, Regional Manager, Health Protection & Environmental Services, Island Health Craig Nowakowski, Supervisor, Health Protection & Environmental Services, Island Health Rory Beise, Environmental Health Officer, Health Protection & Environmental Services, Island Health

Island Health Medical Health Officers

Chief: Dr. Réka Gustafson 250-519-3406 North Island: Dr. Charmaine Enns 250-331-8591 Central Island: 250-739-6304 Cowichan Region: Dr. Shannon Waters 250-737-2020 South Island: Dr. Mike Benusic, Dr. Murray Fyfe, Dr. Dee Hoyano 250-519-3406 islandhealth.ca/about-us/medical-health-officers