



Notice of Meeting and Meeting Agenda Regional Water Supply Commission

Wednesday, April 19, 2023

11:30 AM

6th Floor Boardroom
625 Fisgard St.
Victoria, BC V8W 1R7

MEMBERS:

G. Baird (Chair); C. Stock (Vice Chair); J. Caradonna; N. Chambers; C. Coleman;
Z. de Vries; S. Duncan; C. Graham; S. Gray; C. Green; K. Guiry; S. Hammond;
K. Harper; K. Jordison; S. Kim; D. Lajeunesse; T. Morrison; T. Phelps Bondaroff;
J. Rogers; M. Wagner; M. Westhaver; A. Wickheim

1. TERRITORIAL ACKNOWLEDGEMENT

2. APPROVAL OF THE AGENDA

3. ADOPTION OF MINUTES

3.1. [23-225](#) Adoption of the February 15, 2023 Minutes

Recommendation: That the minutes of the February 15, 2023 Regional Water Supply Commission meeting be adopted.

Attachments: [Draft Minutes, February 15, 2023](#)

4. CHAIR'S REMARKS

5. PRESENTATIONS/DELEGATIONS

Please complete the online application for "Addressing the Board" on our website located here <https://www.crd.bc.ca/about/board-committees/addressing-the-board> and staff will respond with details.

Alternatively, you may email your comments on an agenda item to the Regional Water Supply Commission at iwsadministration@crd.bc.ca. Delegation requests must be received no later than 4:30 p.m. two calendar days prior to the meeting.

6. GENERAL MANAGER'S REPORT

7. COMMISSION BUSINESS

7.1. [23-300](#) Bylaw No. 4541 Water Supply Local Service Area Establishment Bylaw Amendment

Recommendation: That the Regional Water Supply Commission recommends to the Capital Regional District Board:

1. That Bylaw No. 4541, "Capital Regional District Water Supply Local Service Area Establishment Bylaw No. 1, 1997, Amendment Bylaw No. 3, 2023", be introduced and read a first, second, and a third time.

2. That Bylaw No. 4541 be referred to the service participants for approval by way of council and electoral area director consent on behalf, and that if successful, Bylaw No. 4541 be referred to the Inspector of Municipalities for approval.
(WA)

Attachments: [Staff Report: Bylaw No. 4541 Amendment](#)
 [Appendix A: Bylaw No. 4541](#)
 [Appendix B: Bylaw No. 2537 Unofficial Consolidation \(Redlined\)](#)

7.2. [23-302](#) Potential Impacts of Climate Change on Regional Water Supply Operations

Recommendation: There is no recommendation, the report is for information only.

Attachments: [Staff Report: Potential Impacts of Climate Change](#)
 [Appendix A: Current and Potential Climate Change Impacts](#)

7.3. [23-227](#) Summary of Recommendations from Other Water Commissions

Recommendation: There is no recommendation, the summary is for information only.

Attachments: [Summary Of Recommendations from Other Water Commissions](#)

7.4. [23-228](#) Water Watch Report

Recommendation: There is no recommendation, the report is for information only.

Attachments: [Water Watch Report](#)

8. NOTICE(S) OF MOTION

9. NEW BUSINESS

10. ADJOURNMENT

Voting Key:

NWA - Non-weighted vote of all Commissioners

NWP - Non-weighted vote of participants (as listed)

WA - Weighted vote of all Commissioners

WP - Weighted vote of participants (as listed)

Next Meeting: May 17, 2023

To ensure quorum, please contact iwsadministration@crd.bc.ca if you or your alternate cannot attend.

Meeting Minutes

Regional Water Supply Commission

Wednesday, February 15, 2023

11:30 AM

6th Floor Boardroom
625 Fisgard St.
Victoria, BC V8W 1R7

MEMBERS:

G. Baird (Chair); J. Caradonna; N. Chambers; C. Coleman; Z. de Vries;
S. Duncan (EP); C. Graham; C. Green; S. Hammond (EP); K. Harper (EP);
T. Morrison; K. Pearson for D. Lajeunesse; J. Rogers; M. Westhaver (EP); A. Wickheim

STAFF:

T. Robbins, CAO; I. Jesney, Acting General Manager, Integrated Water Services;
A. Constabel, Senior Manager, Watershed Protection; G. Harris, Senior Manager,
Environmental Protection; J. Marr, Acting Senior Manager, Infrastructure Engineering;
S. Irg, Senior Manager, Water Infrastructure Operations; J. van Niekerk, Senior Manager,
Customer and Technical Services; T. Duthie, Manager, Administration Services;
D. Dionne, Administrative Coordinator; J. Zimmerman, Communications Coordinator;
M. Risvold, Committee and Administrative Clerk

REGRETS: S. Gray; K. Guiry; K. Jordison; S. Kim; T. Phelps Bondaroff;
C. Stock (Vice Chair); M. Wagner

EP = Electronic Participation

The meeting was called to order at 11:31 am

1. TERRITORIAL ACKNOWLEDGEMENT

The Chair provided a territorial acknowledgement.

2. APPROVAL OF THE AGENDA

MOVED by Commissioner Rogers and **SECONDED** by Commissioner
Coleman,

That the agenda be approved as circulated.

CARRIED

3. ADOPTION OF MINUTES

- 3.1. [23-099](#) Minutes of the January 18, 2023 Regional Water Supply Commission meeting

Attachments: [Draft Minutes - January 18, 2023](#)

MOVED by Commissioner Rogers and **SECONDED** by Commissioner Morrison,
That the Minutes of the January 18, 2023 meeting be adopted.
CARRIED

4. CHAIR'S REMARKS

The Chair had no remarks.

5. PRESENTATIONS/DELEGATIONS

There were no presentations or delegations.

6. GENERAL MANAGER'S REPORT

There was no report.

7. COMMISSION BUSINESS

- 7.1. [23-106](#) 2023-2027 Regional Water Supply Service Capital Plan Update

Attachments: [Staff Report: 2023-2027 Regional Water Supply Service Capital Plan Update](#)
[Appendix A: Updated 2023-2027 RWS Service Capital Plan](#)

I. Jesney spoke to item 7.1.

Discussion ensued regarding:

- Revenue stream
- Project expansion

MOVED by Commissioner Rogers and **SECONDED** by Commissioner Chambers,
That The Regional Water Supply Commission recommends to the Capital Regional District Board:

That the 2023 Regional Water Supply Service Capital Budget and Five Year Capital Plan be updated to include \$365,000 for Project 20-27 GVWSA Forest Resilience, for ecological restoration thinning trials development and implementation costs and \$365,000 in revenue from the project.

CARRIED

7.2. [23-107](#) 2022 Greater Victoria Water Supply Area Wildfire Management

Attachments: [Staff Report: 2022 GVWSA Wildfire Management](#)
 [Appendix A: 2022 Wildfire Management Activity Photos](#)
 [Appendix B: Wildfire Management Map](#)

A. Constabel spoke to item 7.2.

Discussion ensued regarding:

- Fire prevention strategies that CRD Parks have in place in comparison to those of Watershed Protection
- Motorcycles being ridden in the watershed

There is no recommendation. The report is for information only.

7.3. [23-102](#) Water Conservation Initiative - Once-Through Cooling Project Reduced Rebates Program - Environmental Benefits

Attachments: [Staff Report: Once-Through Cooling Project Reduced Rebates Program](#)

G. Harris spoke to item 7.3.

Staff responded to questions regarding:

- Implications regarding energy use
- Cooling system efficiency

There is no recommendation. The report is for information only.

7.4. [23-091](#) Water Quality Summary Report for Greater Victoria Drinking Water System - July to December 2022

Attachments: [Staff Report: Water Quality Summary Report for GVDWS - July to December 2022](#)
 [Appendix A: Water Quality Summary Report - GVDWS - July-December 2022](#)

G. Harris spoke to item 7.4.

Staff responded to questions regarding:

- Analysis for contaminants in the watershed
- Risks associated with pesticide spraying
- Water temperature concern
- Aesthetic aspects of water
- Snow pack and long-term temperature factors for fire prevention

There is no recommendation. The report is for information only.

7.5. [23-110](#) Summary of Recommendations from Other Water Commissions

Attachments: [Summary Of Recommendations from Other Water Commissions](#)

Staff responded to a question regarding the stormwater program.

There is no recommendation. The report is for information only.

7.6. [23-111](#) Water Watch Report

Attachments: [Water Watch Report](#)

I. Jesney spoke to item 7.6.

Staff responded to a question regarding issues and responsibilities.

There is no recommendation. The report is for information only.

8. NOTICE(S) OF MOTION

There were none.

9. NEW BUSINESS

There was no new business.

10. MOTION TO CLOSE THE MEETING

10.1 [23-112](#) Motion to Close the Meeting

MOVED by Commissioner Chambers and **SECONDED** by Commissioner Caradonna,

That the meeting be closed for appointments in accordance with Section 90 (1) (a) of the Community Charter.

CARRIED

The Regional Water Supply Commission moved into closed session at 12:03 pm.

11. RISE AND REPORT

The commison rose from its closed session at 12:18 pm without report.

12. ADJOURNMENT

MOVED by Commissioner de Vries and **SECONDED** by Commissioner Green,
That the meeting be adjourned at 12:19 pm.

CARRIED

CHAIR

SECRETARY

DRAFT

**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, APRIL 19, 2023**

SUBJECT **Bylaw No. 4541 Water Supply Local Service Area Establishment Bylaw Amendment**

ISSUE SUMMARY

To amend Capital Regional District (CRD) Bylaw No. 2537, "Capital Regional District Water Supply Local Service Area Establishment Bylaw No. 1, 1997", to specify activities included in the Regional Water Supply Service and update the provincial legislation referenced in the bylaw from the *Municipal Act* to the *Local Government Act*.

BACKGROUND

Bylaw No. 2537 establishes the Regional Water Supply Local Service Area but is not consistent with modern establishing bylaws with respect to the authorized activities of the service and does not provide examples or guidance on what is an acceptable activity of a regional water service. The lack of a listing of authorized service activities creates uncertainty and could be questioned where management activities are indirect to water supply, such as the management of the water supply area lands.

The Strategic Plan for Regional Water Supply provides direction to more actively manage the forested water supply lands to mitigate climate change and reduce wildfire risk. Intended management activities such as ecological restoration thinning, will result in the sale of logs. While the existing service has the power to sell logs resulting from forest fuel reduction activities as a result of *Zimmermann v. Greater Victoria Water District*, 1994 CanLII 2115 BC Supreme Court (BCSC); it is worth clarifying that power, along with others in the service's establishing bylaw under modern drafting standards.

In the Greater Victoria Water Supply Area (GVWSA), merchantable logs that result from watershed management activities have historically been disposed of to reduce forest fuels and offset costs, and the ongoing ability to do this will reduce the capital funding required to finance these management activities.

ALTERNATIVES

Alternative 1

The Regional Water Supply Commission recommends to the Capital Regional District Board:

1. That Bylaw No. 4541, "Capital Regional District Water Supply Local Service Area Establishment Bylaw No. 1, 1997, Amendment Bylaw No. 3, 2023", be introduced and read a first, second, and a third time.
2. That Bylaw No. 4541 be referred to the service participants for approval by way of council and electoral area director consent on behalf, and that if successful, Bylaw No. 4541 be referred to the Inspector of Municipalities for approval.

Alternative 2

That the report be referred back to staff for additional information.

IMPLICATIONS

Governance Implications

The proposed amendment promotes good governance by updating the language to refer to the *Local Government Act* and in providing transparency and certainty of the activities that are authorized and contemplated by the water supply service. While the forest/ecological activities planned for the GVWSA could proceed without the amendment, specifically authorizing these activities in the bylaw proactively manages public expectations, uncertainty and risk.

Legal Implications

In 1994, the predecessor corporation to the CRD's operation of the regional water service, the Greater Victoria Water District (GVWD), was directed by the BCSC that commercial logging was not within the scope of activities of a water district, though forest health activities, including the sale of logs, was acceptable. The GVWD from 1949 to 1992 undertook commercial timber harvest on catchment and non-catchment lands and took the position prior to the BCSC decision it could engage in commercial timber harvesting on its own merits.

Though the activities currently being planned to manage the water supply area lands are not for commercial timber (rather for forest health, resilience, management of forest fuels, wildlife habitat and biodiversity), gaining certainty of authority regarding the sale or disposition of any resulting logs is necessary and is an opportunity to modernize the bylaw's example powers in line with other modern establishing bylaws. For clarity, while legislation has changed since 1994 and does permit regional districts to operate enterprises, there is no intention to initiate commercial timber harvesting operations in the GVWSA for the sake of profit-making.

When revising a service establishment bylaw, two-thirds elector approval is required. Elector approval can be obtained by referendum (which is costly), alternative approval process (which is time consuming), and participating area consent on behalf, in this case consent of Councils and the Electoral Area Director for Juan de Fuca. Should the change be approved by two-thirds consent, the bylaw amendment is then reviewed by the Inspector of Municipalities, and if accepted, the amendment can be adopted at a future Board meeting.

CONCLUSION

Bylaw No. 4541 amends "Water Supply Local Service Area Establishment Bylaw No. 1, 1997" to list and authorize activities of the Regional Water Supply Service and updates the bylaw references from the *Municipal Act* to the *Local Government Act*.

RECOMMENDATION

The Regional Water Supply Commission recommends to the Capital Regional District Board:

1. That Bylaw No. 4541, "Capital Regional District Water Supply Local Service Area Establishment Bylaw No. 1, 1997, Amendment Bylaw No. 3, 2023", be introduced and read a first, second, and a third time.

2. That Bylaw No. 4541 be referred to the service participants for approval by way of council and electoral area director consent on behalf, and that if successful, Bylaw No. 4541 be referred to the Inspector of Municipalities for approval.

Submitted by:	Annette Constabel, M.Sc., RPF., Senior Manager, Watershed Protection
Concurrence:	Kristen Morley, J.D., General Manager, Corporate Services & Corporate Officer
Concurrence:	Ian Jesney, P. Eng., Acting General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENTS

Appendix A: Bylaw 4541, "Water Supply Local Service Area Establishment Bylaw No. 1, 1997, Amendment Bylaw No. 3, 2023"

Appendix B: Bylaw 2537, "Water Supply Local Service Area Establishment Bylaw No. 1, 1997" (Unofficial Redlined Consolidation)

CAPITAL REGIONAL DISTRICT
BYLAW NO. 4541

A BYLAW TO AMEND
WATER SUPPLY LOCAL SERVICE AREA ESTABLISHMENT (BYLAW NO. 2537)

WHEREAS:

- A. Under Bylaw No. 2537, Water Supply Local Service Area Establishment Bylaw No. 1, 1997, the Regional Board established a water supply local service in the regional district; as required by the *Capital Region Water Supply and Sooke Hills Protection Act*, S.B.C. Chap. 5.
- B. The Bylaw requires updating to the *Local Government Act* and amendment to provide clear authorization for management of the water supply area; and,
- C. The Board wishes to amend Bylaw No. 2537 to update it for clarity and certainty to the service members.

NOW THEREFORE, the Capital Regional District Board in open meeting assembled hereby enacts as follows:

1. Bylaw No. 2537, "Water Supply Local Service Area Establishment Bylaw No. 1, 1997" is hereby amended as follows:

(a) By replacing section 1, Local Service, in its entirety with:

1. A water supply local service is established in the participating areas. The service established and operated includes acquiring, supplying, and distributing drinking water from any source or sources for the use of the inhabitants of the Capital Regional District for all purposes, and without limiting the foregoing, includes:
 - a) providing high-quality water for current and future users of the water supply service;
 - b) conserving the water supply and managing the water supply area's environment in cooperation with local governments, first nations, the government, and the public;
 - c) managing, acquiring and disposing of land, facilities, and equipment including leasing, maintenance, construction, deactivation, and rehabilitation of roads, drainage structures, bridges, facilities, and other real and personal property associated with the service;
 - d) managing plant and animal invasive species and other biosecurity risks to source water quality, and engaging in wildlife management activities for those species posing a risk to water quality;
 - e) erection, construction, operation, and maintenance of monitoring, communication, conveyance, treatment, scientific, wildfire, wildlife, and security infrastructure and works;
 - f) engaging in forest and ecological management activities and treatments that aid in managing forest fuels, maintaining or improving, forest health, forest resilience,

biodiversity, or wildlife habitat, including the disposal of logs or other by-products resulting from these activities;

- g) engaging in surveillance and security including patrolling by ground and air; and,
- h) engaging in wildfire suppression and wildfire management activities.

(b) By replacing section 4, Cost Recovery, in its entirety with:

- 4. The annual costs for the water supply local service, net of grants and other revenues, shall be recovered by one or more of the following:
 - a) by property value taxes imposed in accordance with Division 2 of Part 11 of the *Local Government Act*,
 - b) by the imposition of a parcel tax imposed under sections 386 and 388 of the *Local Government Act*,
 - c) by the imposition of fees and other charges that may be fixed by separate bylaw; and
 - d) by revenues received by way of agreement, enterprise, gift, grant, or otherwise;

(c) By replacing section 5, Maximum Requisition, in its entirety with:

- 5. The maximum amount that may be requisitioned under section 339(1)(e) of the *Local Government Act* for the annual cost of the local service will be **NIL**.

- 2. This bylaw may be cited for all purposes as "Water Supply Local Service Area Establishment Bylaw No. 1, 1997, Amendment Bylaw No. 3, 2023".

READ A FIRST TIME THIS	th	day of	20__
READ A SECOND TIME THIS	th	day of	20__
READ A THIRD TIME THIS	th	day of	20__
APPROVED BY TWO-THIRDS OF PARTICIPANTS THIS	th	day of	20__
APPROVED BY THE INSPECTOR OF MUNICIPALITIES THIS	th	day of	20__
ADOPTED THIS	th	day of	20__

CHAIR

CORPORATE OFFICER



Making a difference...together

BYLAW NO. 2537

**WATER SUPPLY LOCAL SERVICE AREA
ESTABLISHMENT BYLAW NO. 1, 1997**

**Consolidated for Public Convenience
(This bylaw is for reference purposes only)**

ORIGINALLY ADOPTED NOVEMBER 12, 1997
(Consolidated with Amending Bylaw 3372, [4541](#))

For reference to original bylaws or further details, please contact the Capital Regional District,
Legislative Services Department, 625 Fisgard St., PO Box 1000, Victoria BC V8W 2S6
T: 250.360.3127, F: 250.360.3130, Email: legserv@crd.bc.ca, Web: www.crd.bc.ca

CAPITAL REGIONAL DISTRICT

BYLAW NO. 2537

A BYLAW TO ESTABLISH A WATER SUPPLY LOCAL SERVICE IN THE REGIONAL DISTRICT EXCEPT LANGFORD ELECTORAL AREA, THE GULF ISLANDS AND THE DISTRICT OF HIGHLANDS

WHEREAS

- A. Section 2 of the *Capital Region Water Supply and Sooke Hills Protection Act*, S.B.C. Chap. 5 (the "Act") requires the Capital Regional District, on or before a date specified by Regulation, to adopt for the Water Supply Local Service established under subsection (1) of that Act, a bylaw that meets all the requirements for a bylaw under section 806(1) and (2) of the *Municipal Act*, and includes all or part of each of the initial participating areas;
- B. The approval of the Minister of Municipal Affairs to the bylaw is required under section 2(3) of the Act;
- C. Section 807(1)(b) and (2) of the *Municipal Act* requiring assent of the electors or consent on their behalf, does not apply to this bylaw;
- D. This bylaw is deemed to be a Service Establishment Bylaw under the *Municipal Act*, and Part 24 of the *Municipal Act* applies to the service established under this bylaw, except where the Act and the Regulations under it prevail.

NOW, THEREFORE, the Regional Board of the Capital Regional District in open meeting assembled enacts as follows:

Local Service

1. A water supply local service is established in the participating areas. The service established and operated includes acquiring, supplying, and distributing drinking water from any source or sources for the use of the inhabitants of the Capital Regional District for all purposes, and without limiting the foregoing, includes:
- 1.—
- a) providing high-quality water for current and future users of the water supply service;
 - b) conserving the water supply and managing the water supply area's environment in cooperation with local governments, first nations, the government, and the public;
 - c) managing, acquiring and disposing of land, facilities, and equipment including leasing, maintenance, construction, deactivation, and rehabilitation of roads, drainage structures, bridges, facilities, and other real and personal property associated with the service;

- d) managing plant and animal invasive species and other biosecurity risks to source water quality, and engaging in wildlife management activities for those species posing a risk to water quality;
- e) erection, construction, operation, and maintenance of ~~monitoring, communication,~~ conveyance, treatment, scientific, wildfire, wildlife, and security infrastructure and works;
- f) engaging in forest ~~and ecological~~ management activities ~~and treatments~~ that aid in ~~managing forest fuels,~~ maintaining or improving, forest health, forest resilience, biodiversity, or wildlife habitat, including the disposal of logs or other by-products resulting from these activities;
- g) engaging in surveillance and security including patrolling by ground and air; and
- h) engaging in wildfire suppression and wildfire management activities.

(Bylaw 4541)

Boundaries

2. The boundaries of the water supply local service area are contiguous with the boundaries of the participating areas listed in section 3.

Participating Areas

3. The following are the participating areas in the local service established by this bylaw:

City of Victoria
 District of Oak Bay
 District of Saanich
 Township of Esquimalt
 District of Central Saanich
 Town of Sidney
 District of North Saanich
 Town of View Royal
 City of Colwood
 City of Langford
 District of Metchosin
 District of Sooke
 District of Highlands
 Juan de Fuca Electoral Area

(Bylaw 3372)

Cost Recovery

4. The annual costs for the water supply local service, net of grants and other revenues, shall be recovered by one or more of the following:
 - a) by property value taxes imposed in accordance with Division 2 of Part 11 of the Local Government Act~~by the requisition of money under section 823(1) of the *Municipal Act* to~~

~~be collected by a property value tax to be levied and collected under section 825(1) of the Municipal Act, or;~~

a) —

b) by the imposition of a parcel tax imposed under sections ~~825(2)~~ 386 and 388 of the ~~Municipal Act~~ Local Government Act; and

c) by the imposition of fees and other charges that may be fixed by separate bylaw; and

~~e)d)~~ by revenues received by way of agreement, enterprise, gift, grant, or otherwise;

(Bylaw 4541)

Maximum Requisition

5. The maximum amount that may be requisitioned under section ~~846(4)~~ 339(1)(e) of the ~~Municipal Act~~ Local Government Act for the annual cost of the local service will be **NIL**.

Citation

6. This Bylaw may be cited as "Water Supply Local Service Area Establishment Bylaw No. 1, 1997".

READ A FIRST TIME THIS	10th	day of	September	1997
READ A SECOND TIME THIS	10th	day of	September	1997
READ A THIRD TIME THIS	10th	day of	September	1997
APPROVED BY THE MINISTER OF MUNICIPAL AFFAIRS THIS	23rd	day of	October	1997
ADOPTED THIS	12th	day of	November	1997

Geoff Young
Chairperson

Carmen Thiel
Secretary

FILED WITH THE INSPECTOR OF MUNICIPALITIES THIS	14th	DAY OF	November	1997
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**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, APRIL 19, 2023**

SUBJECT **Potential Impacts of Climate Change on Regional Water Supply Operations**

ISSUE SUMMARY

To provide the Regional Water Supply Commission an update on the impact that climate change has on Capital Regional District (CRD) Regional Water Supply operations and the ability to provide water to Greater Victoria.

BACKGROUND

At its January 20, 2021 meeting, the Regional Water Supply Commission directed staff to bring forward a report outlining the current and potential future impacts of climate change on Regional Water Supply operations and the CRD's ability to provide water to the region. A report was presented March 17, 2021 with the Commission further directing staff to provide an update every two years.

Across the organization, the CRD is working to adapt to the changing climate across its service areas by identifying vulnerabilities and strategies to improve how we anticipate, respond to and recover from both extreme weather events and the gradual changes occurring over time. This commitment is embedded in the CRD's 2021 Climate Action Strategy, various plans and corporate procedures. As new science and global climate projections advance, the CRD will continue to undertake analysis to understand climate changes and their impacts and adjust responses accordingly. This will be supported through an update to the Pacific Climate Impact Consortium's 2017 Downscaled Climate Projections for the Capital Region, in late 2023.

At a departmental level, staff have been considering the impact of climate change on many aspects of the Regional Water Supply Service for some time. The CRD Regional Water Supply Master Plan approved by the Commission in 2022 considers the impacts of climate change, with regards to recommendations for new infrastructure to meet future water demands and potential water quality risks. This report summarizes the current knowledge, understanding and expected or potential impacts of climate change on Regional Water Supply now and into the future; and provides planning and actions that are being taken to mitigate anticipated climate change risks.

Details of current and potential climate change impacts are outlined in Appendix A.

CONCLUSION

Staff have been monitoring the Regional Water Supply System for the effects of climate change and impacts on operations. To date there has been no impact on the ability to provide bulk and retail drinking water related to climate change. Regional Water Supply plans consider climate change risks, and designs and operations implement adaptation initiatives and actions to prepare the Regional Water Supply System for anticipated future impacts from climate change.

Most importantly for water supply, current climate change models downscaled for the CRD project a net increase in total annual precipitation by 2050, though summer drought conditions are expected to occur more frequently and for longer periods.

Continued investment in the Regional Water Supply capital plan to fund the necessary studies, plans and infrastructure upgrades are key to adapting to the projected impacts of climate change and continuing to provide an adequate supply of high-quality drinking water to the region for the long term.

RECOMMENDATION

There is no recommendation, the report is for information only.

Submitted by:	Annette Constabel, M.Sc., RPF., Senior Manager, Watershed Protection
Submitted by:	Joseph Marr, P.Eng., Acting Senior Manager, Infrastructure Engineering
Submitted by:	Shayne Irg, P.Eng., Senior Manager, Water Infrastructure Operations
Submitted by:	Glenn Harris, Ph.D., RPBio., Senior Manager, Environmental Protection
Concurrence:	Ian Jesney, P. Eng., Acting General Manager, Integrated Water Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

ATTACHMENT(S)

Appendix A: Current and Potential Climate Change Impacts

Current and Potential Climate Change Impacts

What Change in Climate is Expected?

There has been no significant change to the predicted climate change modelling specific to the Capital Regional District¹, which forecasts the following:

- An increase in rainfall in fall, winter and spring; and a decrease in rainfall in summer – with a projected 5 % net increase in total annual precipitation.
- Major rainfall events in the fall and winter will be more intense, longer in duration, and more frequent.
- Winter snowfall will become less frequent over time, but in the short term there may be more frequent heavy snowfalls and rain on snow events.
- Temperatures will be higher throughout the year; there will be hotter summers and less days with freezing in winter.
- There may be multiple consecutive years with more extreme climate events (such as long hot, dry summers or winter storms).
- Increased variability of climate within and between years. Despite a warming trend, there will still be summers that are cooler and wetter and winters that are colder with snow.

Air temperatures (both average and highs) are expected to reach levels higher than what has been experienced in the past 100 years. However annual precipitation is expected to remain within the range of variability experienced in the last century with a slow upward trend. This is an important climate change factor from a water supply perspective and provides the region much more certainty and optimism for water supply than predicted for many other jurisdictions, such as those dependent on snowpack.

The magnitude of these projected changes within and between years will be influenced by:

- Variation in 'teleconnections' that affect climate in the Pacific such as the El Nino/Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO).
- Changes in the path and stability of the jet stream which may bring continental weather conditions to the coast more frequently or for longer duration, which would lead to periods of unusually cold or hot weather.

There is considerable uncertainty on the effect of these large-scale phenomena with a changing climate.

¹ Based on 2017 projections from the Pacific Climate Impacts Consortium (University of Victoria) downscaled to the CRD based on averaged projections of 12 global climate models using two greenhouse gas emission scenarios for the periods 2041 – 2070 and 2071 – 2100.

CURRENT CLIMATE CHANGE IMPACTSImpact on Water Supply

It is difficult to show that climate change is already having a direct impact on water operations. To date climate change has not affected the CRD's ability to operate the Regional Water Supply (RWS) Service and provide drinking water to the region. There have been no RWS service disruptions or water quality advisories that are directly linked to climate or weather. Water main breaks have caused localized water service disruption and there have been spikes in algal communities that have affected taste and odour, but no more than has been experienced in the past and likely less than was experienced prior to raising of Sooke Lake dam.

Sooke Lake Reservoir Water Storage

The raising of Sooke Lake Dam in 2002-2003 allowed for an almost doubling of stored water in Sooke Lake Reservoir. The Reservoir reached its new full storage capacity in 2006 and since then has failed to fill only once, in 2009.² This along with a decreasing trend in total RWS water consumption that has only recently seen upward movement again, has meant that Sooke Lake Reservoir has only depleted to an average low of 182.4 metres or 68 % of full capacity in the last ten years (Figure 1).

Recent demand projections from the RWS 2022 Master Plan indicate that Sooke Lake Reservoir will be at its capacity by 2045 with increased population and the conservative assumption of little change in per capita consumption. The RWS 2022 Master Plan recommends CRD start planning for diversion of the Leech River in 2032 with the Leech River additional water source to be in service by 2042.

² Sooke Lake Reservoir has a total volume of 160.32 million m³ of which 92.70 million m³ are available for water supply. Available storage is the volume of water that can flow into the water supply intake via gravity.

Current and Potential Climate Change Impacts

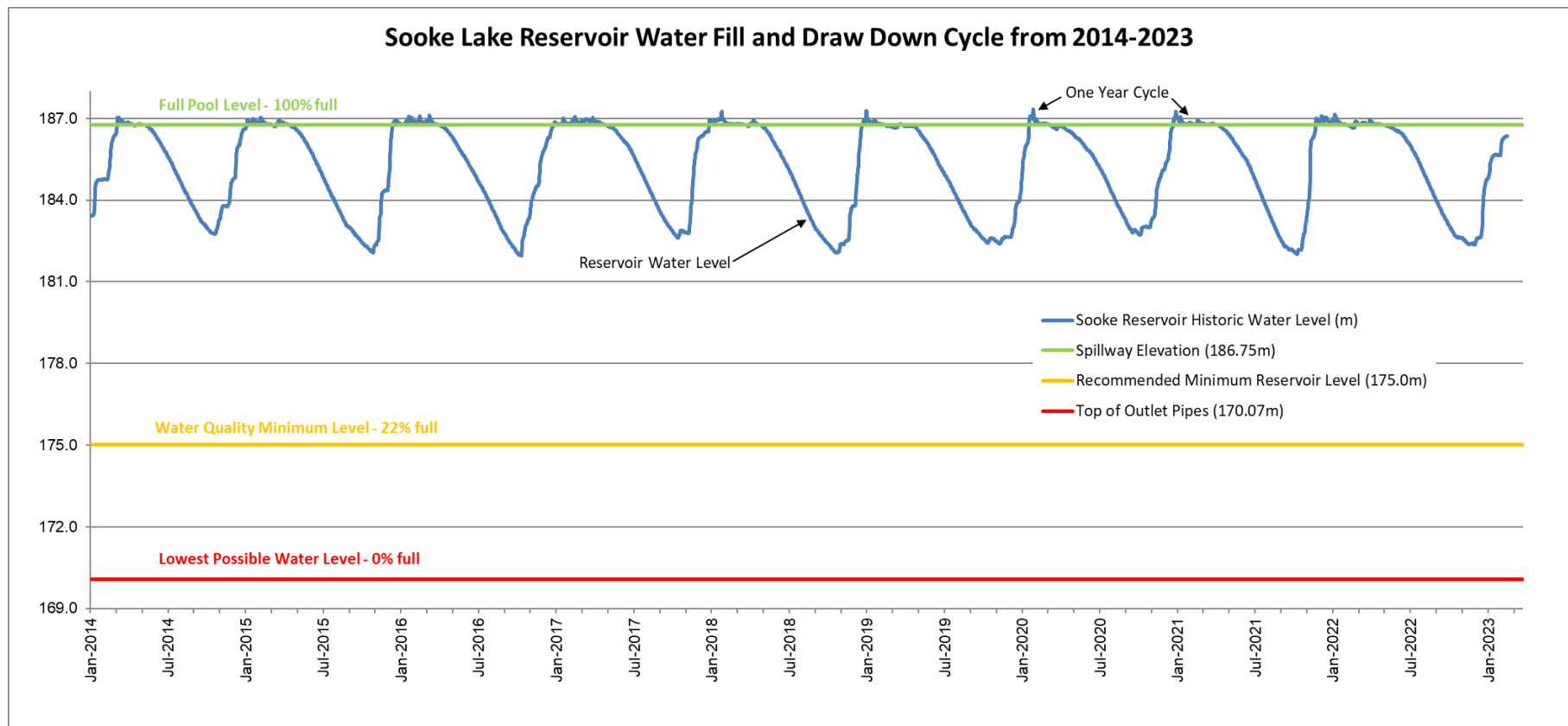


Figure 1. The green line indicates reservoir full pool (100 %), the red line indicates the lowest level of water intake possible (0 %) and the yellow line indicates a minimum recommended level to maintain drinking water quality (22 %). N.B. The upper metres of the reservoir hold more water volume due to its natural valley shape.

Current and Potential Climate Change Impacts

Total Precipitation

Downscaled climate change models for the CRD predict more precipitation over a long-term trend with greater and more frequent extremes. The average annual precipitation for the Sooke watershed that supplies Sooke Lake Reservoir does not appear to show a long-term trend since 1896. The 30 year rolling average at times shows an increase, at times a decrease, or a steady state (Figure 2). The number of unusually wet years (above the blue line) and unusually dry years (below the yellow line) over the last 127 years is nearly equal, with on average three years out of ten with unusual wet or dry total annual precipitation. Related to Sooke Lake Reservoir water supply, back-to-back years of unusually low precipitation that did not fill the reservoir would be a concern. The Sooke Lake Reservoir stores sufficient supply to withstand an individual year of low precipitation.

Current and Potential Climate Change Impacts

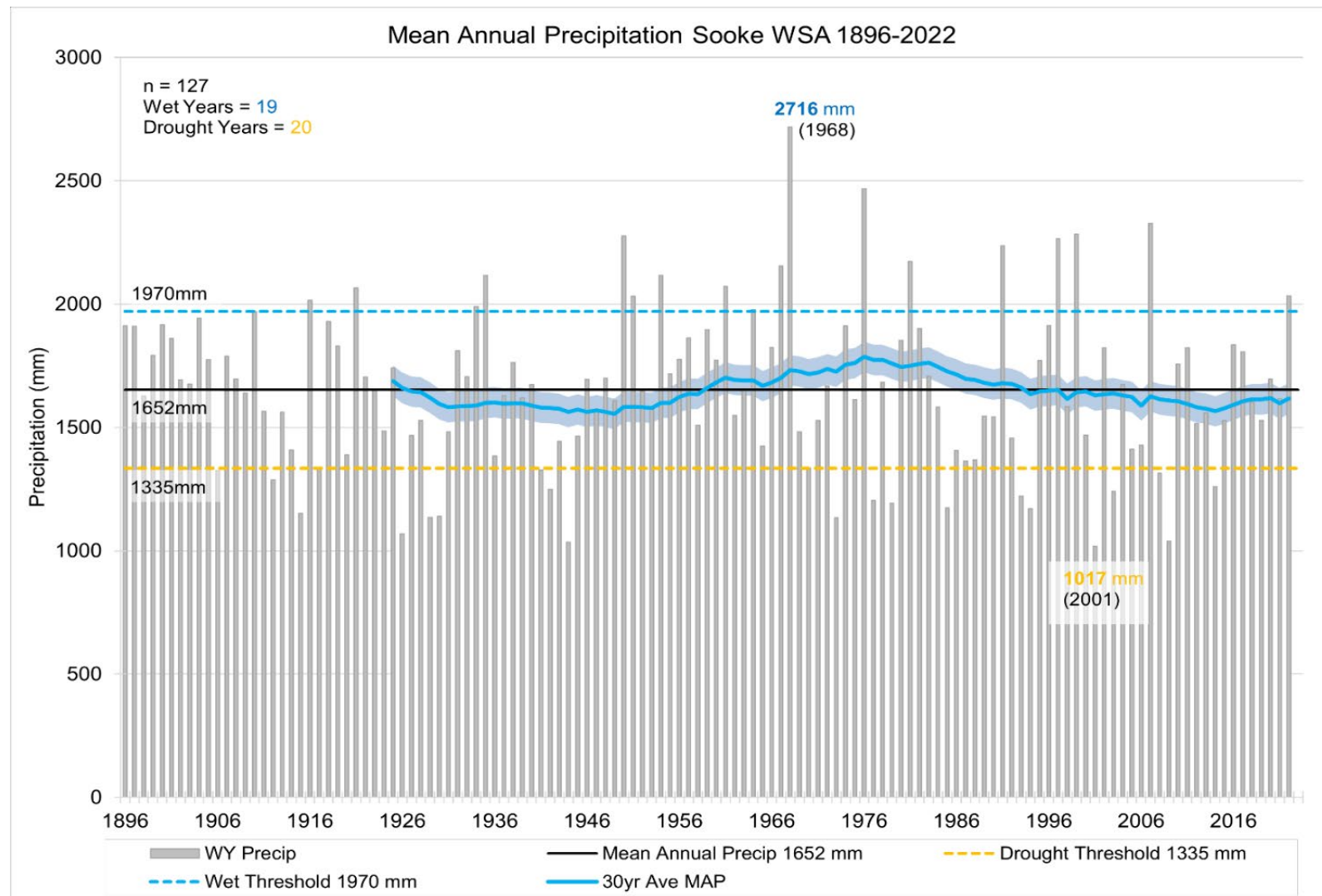


Figure 2. The black line shows the average annual precipitation over the last 127 years at the Sooke Lake Dam weather station. The dashed blue line indicates the threshold for an unusually wet year, and the yellow line indicates the threshold for an unusually dry year, compared to the long term average. Also shown are the years of highest and lowest annual precipitation and the 30 year rolling average trend.

Current and Potential Climate Change Impacts

Impact on the Greater Victoria Water Supply Area (GVWSA)

The GVWSA has rocky terrain, coarse textured soils and is a forest ecosystem that is the watershed or basin for precipitation, which naturally holds, filters and drains the water into the rivers and lakes/reservoirs that supply the source water for the RWS system. Impacts to the natural ecosystem that change the ability and rate of holding, filtering and draining water have the potential to impact source water quality. The ecosystem has resilience and is naturally dynamic (ever changing and responding to changes), but ecosystems can also reach thresholds where the amount of change exceeds the ability of the system to adapt or absorb the changes within its normal range of variation; resulting in an ecosystem with reduced function. Examples of changes that alter ecosystem function include landscape scale wildfires and landscape scale harvesting, that change hydrology and water quality for decades before recovering to a new level of function. The extent and frequency of natural disturbances such as wildfire are influenced by weather and therefore climate change.

Both naturally and through past planting of harvested stands, Douglas-fir dominates the forests of the GVWSA. Sediment core research near Sooke Lake Reservoir shows that this species has been a prominent part of the forest for 11,700 years, including 8,000 to 10,000 years before present when the climate was thought to be 1 - 2 °C warmer and drier than present, forests were more open and wildfire was more common on the landscape.³ Predicted biogeoclimatic (BEC) shifts as a result of climate change point to an upward shift in the Coastal Douglas-fir BEC zone and a shift within the Coastal Western Hemlock BEC zone from the Moist Maritime to the Very Dry Maritime variants.⁴ These climate-based shifts in the natural forest environment of the GVWSA continue to support Douglas-fir dominated forests as an appropriate and major forest type.

Overall vegetation biomass and carbon storage are projected to continue to increase (in the absence of wildfire) due to the cessation of commercial timber harvesting in 1993 though with increased tree mortality due to competition for moisture.^{5,6}

Summer Dry Period Duration and Frequency

Downscaled climate change models for the CRD predict longer and more frequent summer dry periods. The length and frequency of extended summer drought is important to the health and resilience of the forests, flora and fauna that support Regional Water Supply water quality. The 30 year rolling average of the number of consecutive days when precipitation is less than 4 mm shows a general decrease from the 1950's to 1990's, but then an increase to 2022 (Figure 3). Notably the three longest dry periods in the record all occurred in the last 11 years, along with two notably short dry periods, which indicates a recent uptick in the number of more extreme summer dry periods. Established trees and vegetation tend to stagnate or dieback but survive one season of adverse growing conditions (drought) but could succumb from drought or other forest insects and diseases after successive or repeated adverse growing seasons.

³ Brown KJ, Hebda NJR, Schoups G, Conder N, Smith KAP and Trofymow JA (2019). Long-term climate, vegetation and fire regime change in a managed municipal water supply area, British Columbia, Canada. *The Holocene* Vol. 29(9): 1411-1424.

⁴ A comparison of the current provincial mapping of biogeoclimatic subzone variants in the Greater Victoria Water Supply Area with a projection of the potential change in the distribution of these variants under a warmer and drier future global climate model scenario - based on the work of Hamann and Wang (2006). Potential effects of climate change on ecosystem and tree species distribution in British Columbia. *Ecology* 87: 2773-2786.

⁵ Smiley BP, Trofymow JA and Niemann KO (2016). Spatially-explicit reconstruction of 100 years of forest land use and disturbance on a coastal British Columbia Douglas-fir-dominated landscape: implications for future watershed-scale carbon stock recovery. *Appl Geog* 74: 109-122.

⁶ Trofymow JA, Hember R, Smiley B and Kurz W (2016). Potential climate-change impacts on future forests and carbon budget of the Greater Victoria Water Supply Area Sooke Lake Watershed. Research Report submitted to the Capital Regional District.

Current and Potential Climate Change Impacts

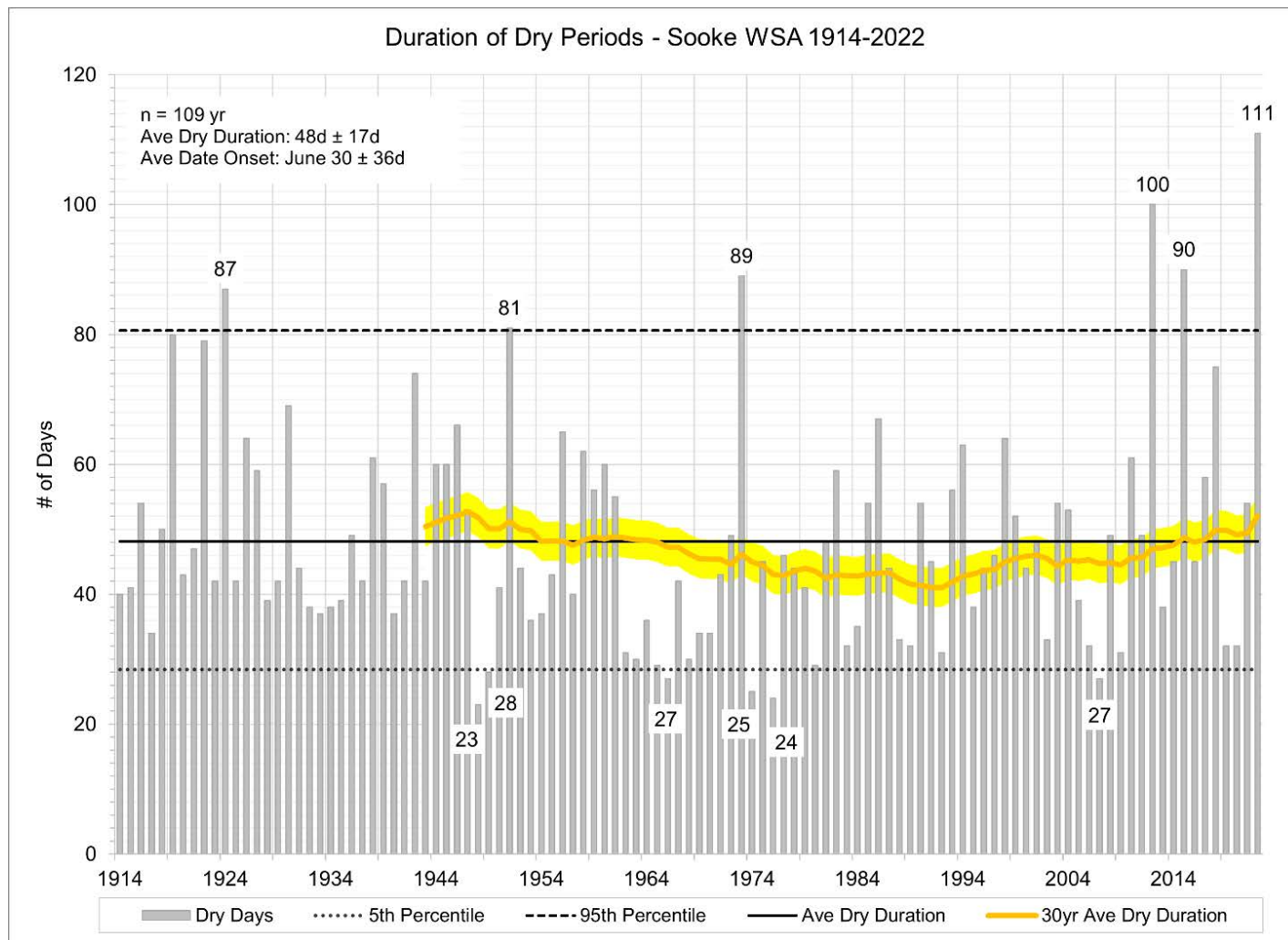


Figure 3. The maximum number of consecutive days per year with no or minimal (< 4 mm) precipitation (dry period). The average dry period per year over the 109 year record is 48 days (solid black line). The dashed line indicates a threshold for unusually long dry periods and the dotted line for unusually short dry periods.
GVWSA Forest (Tree Species) and Wildlife Health

Current and Potential Climate Change Impacts

Starting in approximately 2010, mortality of lodgepole pine growing on the dry rocky hilltops in the GVWSA has been evident. As of 2017, this had affected 340 hectares (ha) collectively of the 20,605 ha GVWSA. It is likely that tree mortality was triggered by drought stress periods compounded by insects that are attracted to stressed, dying trees. Ongoing assessments of the aerial imagery captured every two years for the GVWSA indicate the area affected and number of lodgepole pine dying continues to slowly expand. However, based on ground visits to these sites, only about 10-20% of the trees at these sites are impacted and the pine and Douglas-fir growing on the best sites on these hilltops appear to be healthy and growing well.

The extremely dry spring and early summer of 2018 illustrate the importance of timing of moisture availability as key beyond the duration of the dry season. By September 2018 approximately 170 ha in the Sooke and Goldstream watersheds were identified where mature western red cedar exhibited greater than usual summer foliage dieback and the production of a large 'distress crop' of cones. The moisture stress during the 2018 growing period is also thought to have increased the number of trees dying that year from Douglas-fir beetle attack, root disease and white pine blister rust; and suspected to have caused increased mortality into 2019 from fir engraver beetle and white pine blister rust (Figure 4).

The areas where trees were observed to be dying dropped considerably in the annual aerial overview surveys in 2020 to 2022 (Figure 4). These surveys also indicated that the mature western red cedar stressed by drought in 2018 recovered. Interestingly, we have not seen significant effect of the June "heatdome" event of 2021 in terms of tree mortality. Forest health effects associated with the extended dry period in the fall of 2022 will likely show up in the next aerial overview survey to be carried out in July 2023.

While an increase in forest health impacts attributed to climate change (specifically the timing and duration of dry periods) have been observed; these impacts remain minor in nature.

There have been no observed effects of climate change on fish and wildlife species in the GVWSA. These species are well adapted to summer moisture deficits, but any increase in these conditions will likely create additional stress for species relying on small water bodies, wetlands, and pools in streams that will dry more quickly.

Current and Potential Climate Change Impacts

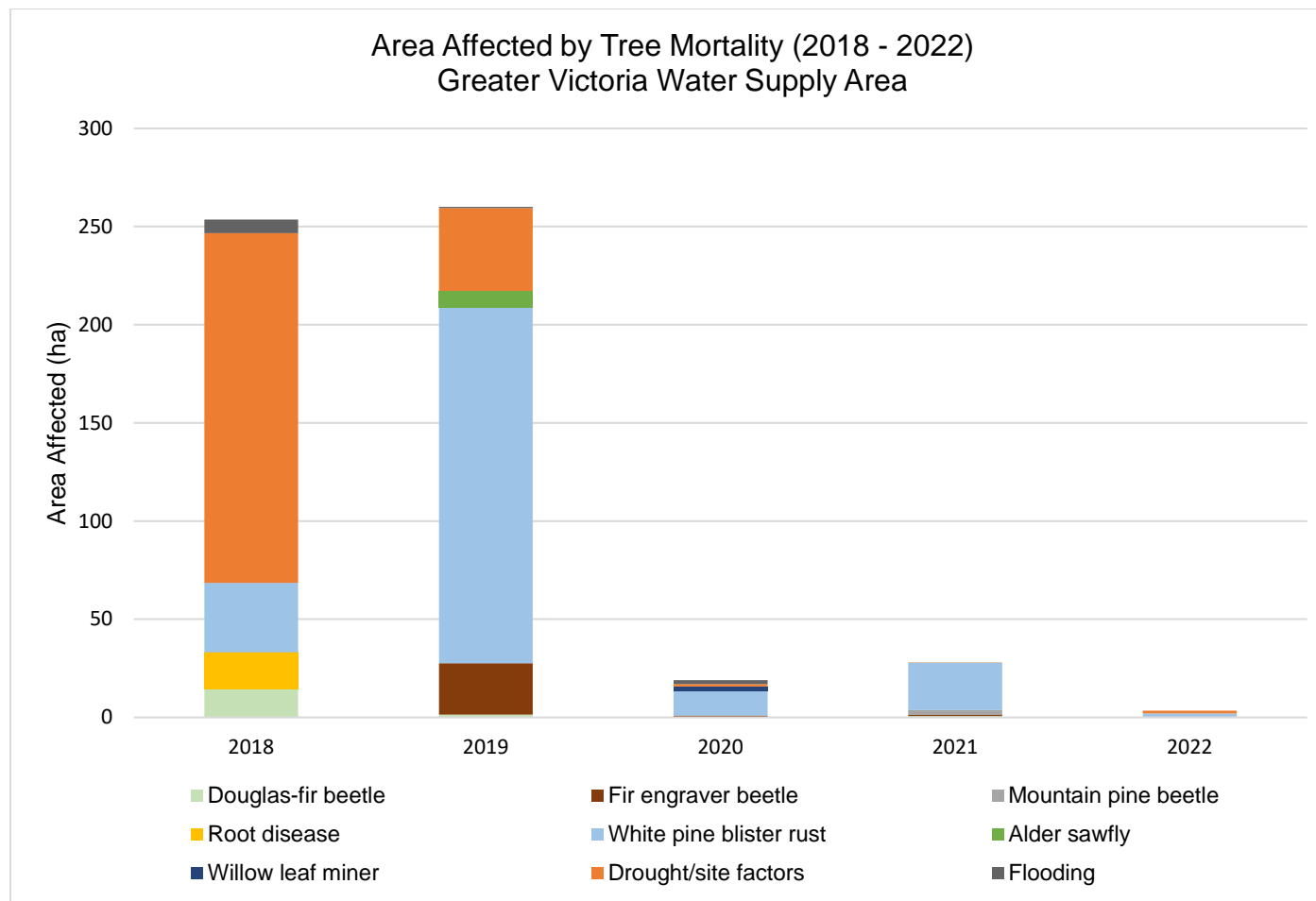


Figure 4. The area affected by forest insects, diseases, drought and flooding based on annual aerial overview surveys to monitor forest health. Follow up ground surveys are carried out where needed to confirm the species and/or conditions contributing to tree mortality. Tree mortality from flooding can be due to more intense long duration rainfall that overfills small waterbodies or beaver activity in wetlands.

Current and Potential Climate Change Impacts

Wildfire

The projected climate change increases in temperature and summer dry periods have increased the duration and magnitude of wildfire risk. Modelling associated with a wildfire risk assessment for the GVWSA indicated that Fire Weather Index⁷ (FWI) values above 28 have the potential to result in quickly spreading wildfires that are difficult to suppress and have the potential to affect large areas.⁸ The trend indicates an increase of 20 high risk days over the last 27 years with some years of notably long periods of high risk (Figure 5).

⁷ Fire Weather Index (a fire intensity metric based on the cumulative fire season weather effect of precipitation and fuel dryness, relative humidity, windspeed and air temperature).

⁸ Perrakis D, Stohmann R and Taylor S. (2019). Wildfire risk analysis for the CRD Greater Victoria Water Supply Area. Canadian Forest Service Report PFC-CRD-09.

Current and Potential Climate Change Impacts

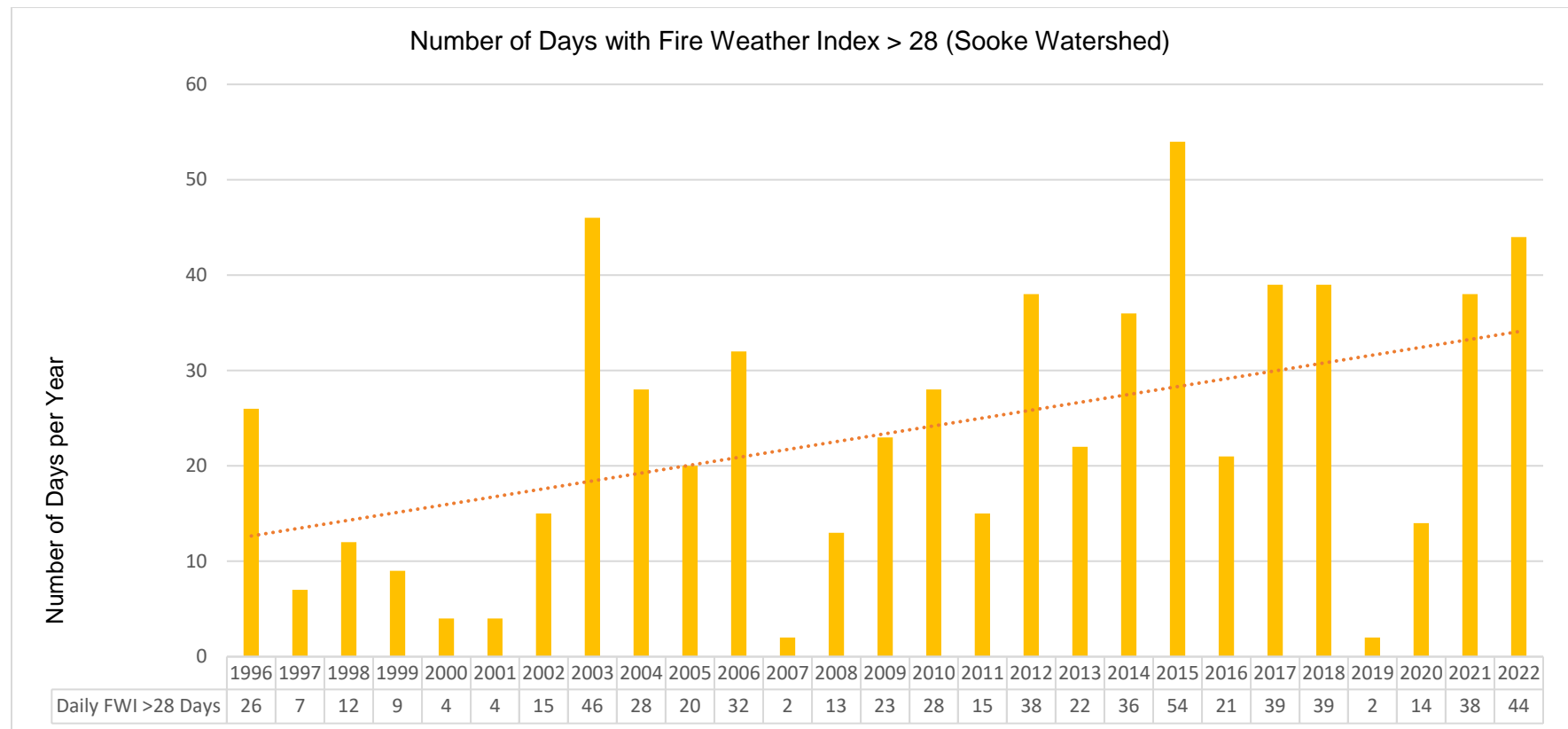


Figure 5. Sooke watershed number of days per year with Fire Weather Index (FWI) above 28 between 1996 and 2022.

Current and Potential Climate Change Impacts

Impact on Aquatic Ecology in Sooke Lake Reservoir

The aquatic ecology in Sooke Lake Reservoir and other waterbodies in the GVWSA represent their own ecosystems that have a direct impact on source water quality. In general, increased water temperature is more likely to lead to algal production and potentially to a shift in algae species distribution, however the availability of key nutrients is also an important and limiting factor to algal growth. Figure 6 shows the average annual water temperature and number of days of elevated raw water temperature in the period before (1991 – 2005) and after the raising and filling of Sooke Lake Reservoir (2006 onwards). Average annual water temperature decreased slightly but the number of days of temperature exceedance (above Canadian Drinking Water Guidelines) reduced markedly with the increase in water volume and water depth with dam expansion.

In terms of water taste and odour (Figure 7) there is no ongoing correlation in the last ten years between annual taste and odour values and water temperature. There has been an increase in the number of days with elevated raw water taste and odour between 2018 and 2021, however in 2022 it dropped again to previous levels along with a drop in air and water temperature. Algal species population dynamics within aquatic ecosystems remain complex and not easily predicted by water temperature alone.

In terms of current climate change impacts including water temperature, available monitoring data indicate stable trends in critical water quality parameters and no trends or shifts outside of typical variation have been noted in aquatic ecology. Species populations in all trophic levels seem to remain unchanged in distribution and density to the degree they have been monitored and studied to date. It appears that the natural buffering capacity of the well-established and stable aquatic ecosystems in the source water reservoirs has so far been able to absorb climate change impacts. Additional monitoring efforts and studies are planned to specifically look at trends and impacts that are expected as a result of climate change, in particular from rising temperatures and increased storm intensity.

Current and Potential Climate Change Impacts

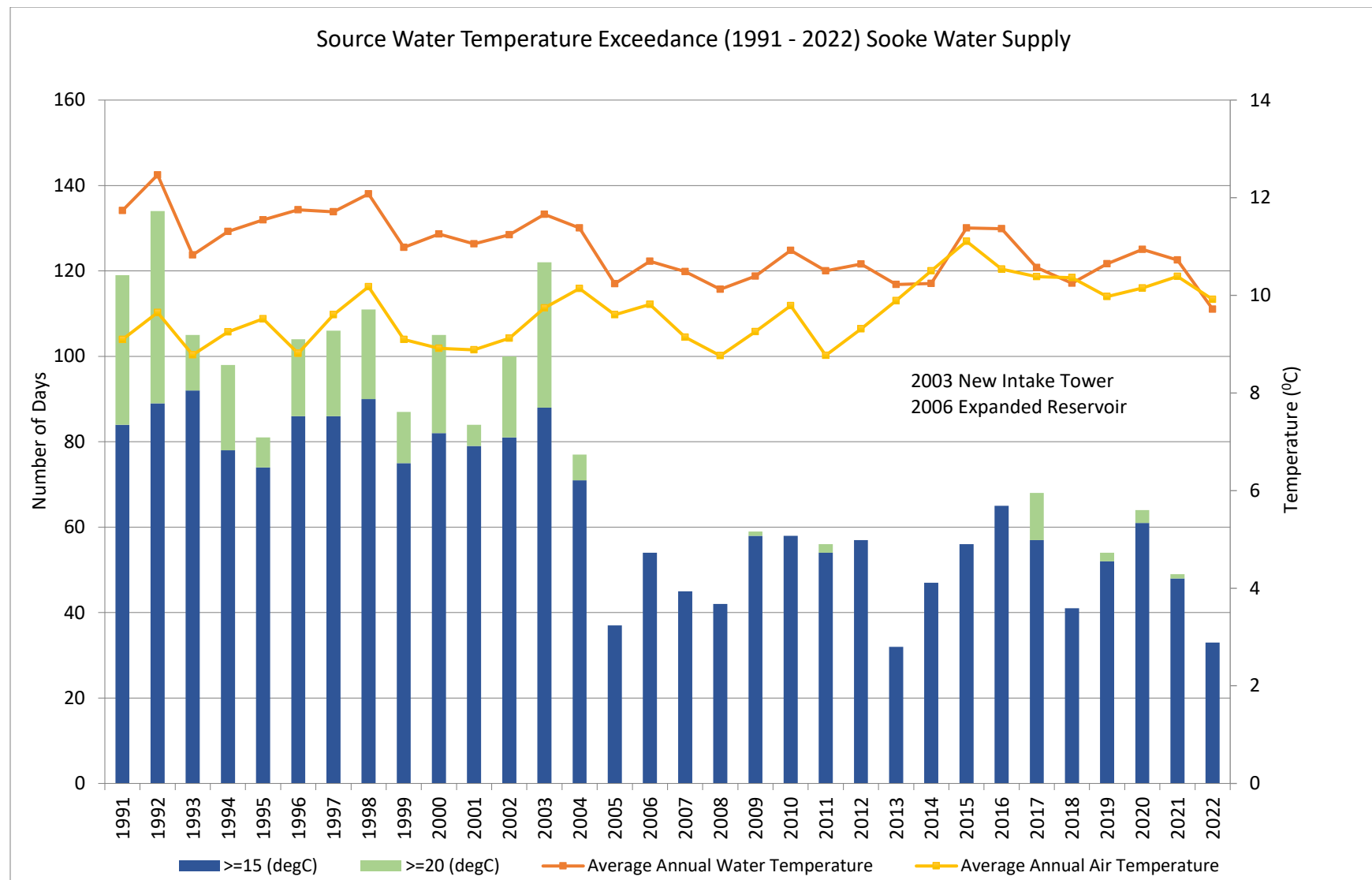


Figure 6: Number of days water temperature exceeded 15°C and 20°C at the Goldstream Water Treatment Facility between 1991 and 2022, before and after Sooke Lake Reservoir expansion, with annual air and water temperature for reference.

Current and Potential Climate Change Impacts

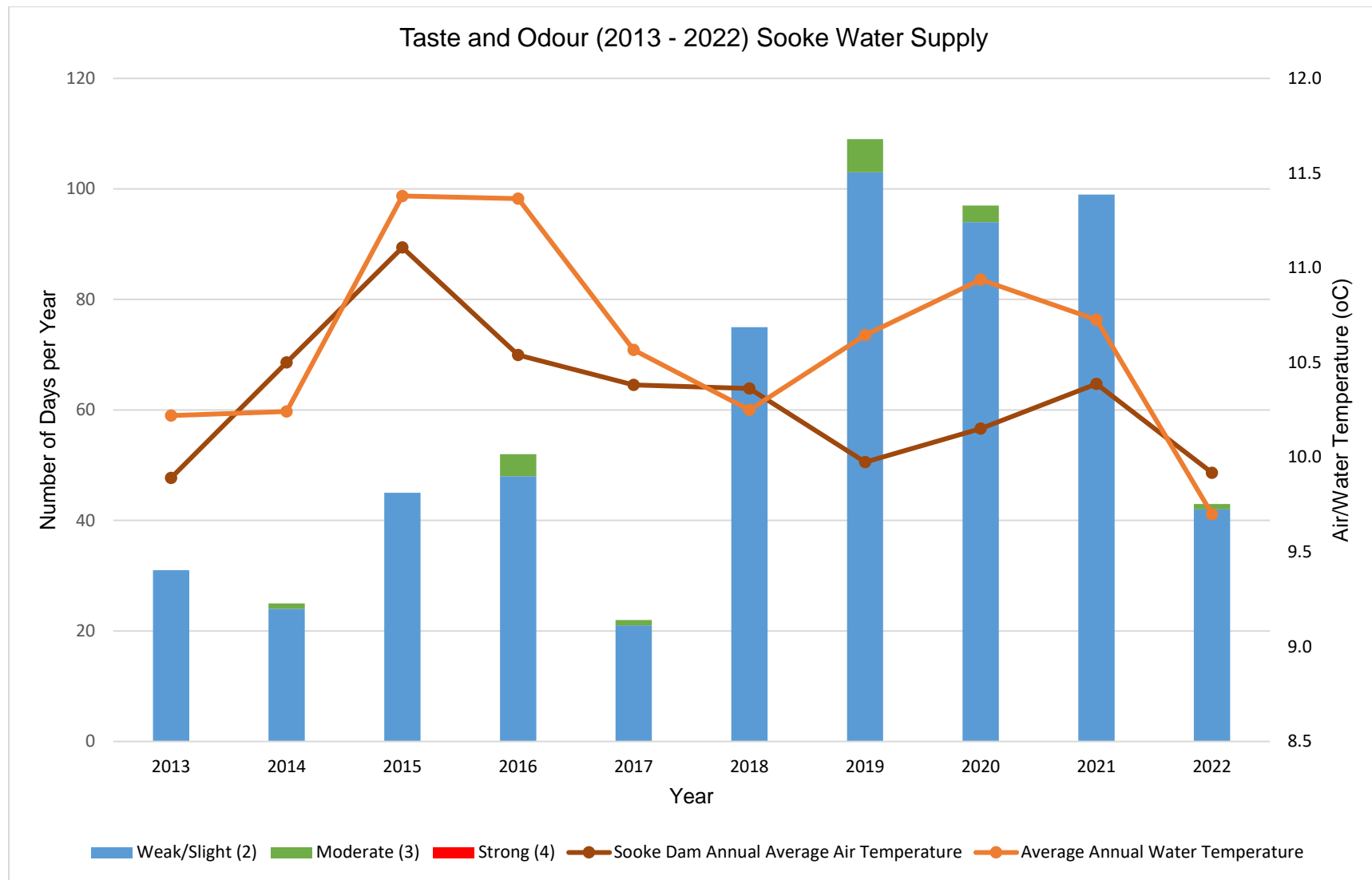


Figure 7: Taste and odour of source water entering Goldstream Water Disinfection Facility from 2013 to 2022. Depicted are the number of days per year when taste and odour values were detectable from weak to strong. Annual air and water temperature are provided for reference.

Current and Potential Climate Change Impacts

POTENTIAL FUTURE IMPACTS

There are two main climate change factors that have the ability to impact the Regional Water Supply Service and its ability to provide drinking water to the region in the future 1) increased storms; and 2) increased temperature and summer drought. The way that these climate change factors could impact regional water supply and operations are summarized below.

Impact on the Ability to Supply High Quality Drinking Water

1. Increased number and severity of storms causing increased risk of:

- Inputs of sediment, organic material, and associated nutrients carried into water supply reservoirs by streams and adjacent slope failures that could impact disinfection processes at water treatment plants, affecting water quality or chemical dosing.
- Elevated levels of nutrients in source water increasing the potential for algal blooms that could cause water taste & odour issues or cyanotoxin production.
- Turbidity issues in the Goldstream River and Japan Gulch Reservoir that would cause water quality concerns during periods when the water system is on the backup/emergency Goldstream Water Supply.⁹

2. Increased temperature and summer drought causing increased risk of:

- Increased turbidity, organic material and nutrients suspended in source water from storms after larger summer drawdowns. Major wildfire in the GVWSA that would negatively affect water quality in supply reservoirs for a short or longer term.
- High drinking water temperatures that further exceed and prolong non-compliance with Canadian Drinking Water Guidelines and increase customer water quality complaints.
- Change in microbial population distribution in supply reservoirs to more and new harmful algal and bacteria species (e.g. cyanobacteria) with potential toxin production and/or taste & odour impacts.
- Low oxygen levels at the bottom of the reservoir, which could result in nutrients transferring from sediments into the water column triggering algal blooms; and/or metal compound releases from sediments leading to impacts on water quality.
- Fish or other aquatic species die-offs due to lack of oxygen or algal toxins.
- Higher evaporation and higher water demand leading to lower reservoir levels in summer with higher water temperatures which could result in stronger and longer algal events and overall decreased raw water quality due to increased bio-chemical activity.
- Water quality impacts from invasive species as a result of a shift in the food web, leading to higher nutrient concentrations with effects on algal events, turbidity, lower oxygen levels and altered water chemistry.

Impact on Water Treatment and RWS Control Centre

1. Increased number and severity of storms causing increased risk and/or cost from:

⁹ The switch to the Goldstream Water Supply System carefully considers the potential for precipitation during the switchover period to minimize the potential for turbidity issues.

Current and Potential Climate Change Impacts

- Increase in the number of multi day events that elevate the amount of inorganic and organic material or pathogen load in water entering water treatment facilities, requiring higher dosing and use of chlorine and ammonia disinfectant chemicals; an increased risk of harmful disinfection byproducts; increased taste & odour complaints due to increased chlorine.
 - Fluctuations in turbidity levels associated with storm events require additional monitoring and additional treatment processes such as filtration.
 - Power outages require more frequent operation on backup power and backup generators not sufficient to power treatment during maximum demand periods.
 - Potential disruption of delivery of disinfection chemicals from Vancouver.
2. Increased temperature and summer drought causing increased risk and/or cost from:
- Higher peak demands and daily variation in water use during summer which challenges existing disinfection infrastructure, increases wear and tear on infrastructure, and may create more turbidity in the supply system requiring more disinfection chemicals.
 - Higher demands may require additional storage facilities throughout the system.
 - Increased disinfection demand due to higher pathogen and particle load as a result of low reservoir levels and warmer water temperatures.
 - Higher potential of having to treat cyanotoxins due to cyanobacteria blooms.

Impact on the Water Transmission System

1. Increased number and severity of storms causing increased risk and/or cost from:
- Slope movement or failures in vulnerable areas that contain underground transmission mains (e.g., near Goldstream Water Treatment Plant).
 - Additional complications and delays in water main installation and repair projects in the winter months.
 - Increased maintenance of strainers and screens upstream of valves and in other parts of the system due to higher sediment load.
 - Increase in the accumulation of sediment in water storage reservoirs in the transmission and downstream distribution systems.
2. Increased temperature and summer drought causing increased risk and/or cost from:
- Biological re-growth in the transmission system requiring flushing, higher dosing and other operational response.
 - Need for re-chloramination near the ends of the system.
 - Inorganic and organic material from increased reservoir drawdowns which could affect filters used by customers.

Impact on the Greater Victoria Water Supply Area

1. Increased number and severity of storm events causing:
- a) increased damage of:
- Water supply infrastructure from high wind, heavy precipitation, downed trees and

Current and Potential Climate Change Impacts

powerlines, rough and rapidly changing water conditions.

- Radio systems that transmit data from SCADA, weather stations, water level sensors and security cameras.
- Roads and drainage structures from flooding, slope failures, erosion and woody debris.

b) increased cost from:

- Large areas of downed trees that require reforestation.
- Increased woody debris removal from reservoirs.
- Larger drainage structures and bridges that are required to manage increased flows.
- Maintaining road access (storm damage and snowfall)
- More frequent rainfall shutdowns causing delays

c) system concerns:

- Increased turbidity issues in the Goldstream River and Japan Gulch Reservoir that would prevent the use of the secondary Goldstream Water System in case of inspection, and repairs or emergency on the primary Sooke Water System.

2. Increased temperature and summer drought resulting in increased risk and/or cost from:

- Fire starts resulting in a landscape level wildfire that threatens water quality and water treatability.
- Decreased tree and forest stand resilience and increased mortality from drought stress, forest insects and diseases. Risk of forest ecosystem changes resulting in reduced source water quality.
- Greater drawdowns in summer, more rapid reservoir rise in winter leading to increased sedimentation, turbidity and the potential to impact earthen dams.
- More GVWSA wildfires that require increased effort and expense to prevent and control.
- Extended periods of extreme fire conditions with operational constraints that limit active work periods to maintain and upgrade infrastructure and the GVWSA.
- Possible need for forest species conversion with reforestation of climate adapted tree species or stock.
- New or increased incursion of invasive species adapted to warmer drier conditions that require effort and expense to curb or remove.
- Increased dead or damaged trees that must be assessed and removed or modified to meet BC WorkSafe requirements for the safety of facilities, infrastructure, work sites, and road use.
- Atmospheric carbon dioxide fertilization effect could cause vegetation to grow more quickly requiring more resources devoted to brushing around infrastructure including dams.
- Potential for earlier bird nesting and a longer nesting period that will constrain some operational field projects and activities during that period.

Current and Potential Climate Change Impacts

Mitigating Factors to the Impacts of Climate Change

It is important to note that the potential impacts listed above have been identified for the purposes of risk assessment and evaluation. Potential increases in the probability and consequences of these events do not necessarily translate into major impacts to the water supply or operations. There are many uncertainties about the potential rate of change and scale and magnitude of such impacts.

A number of programs, initiatives and factors in managing the Regional Water Supply System reduce the vulnerability to the impacts of climate change summarized in the tables above. They include the following:

Water Supply

- The Regional Water Supply 2022 Master Plan is complete which considers projections for water demand, water sources limitations and opportunities, climate change issues, transmission system risks and resiliencies, treatment risk, resiliency and future regulatory environment, seismic risks and resilience; and planned orderly infrastructure changes for the RWS for the next 30 years.
- A Supply System Risk and Resilience Study is complete which identifies system risks including those related to climate change.
- A Deep Northern Intake, Transmission and Treatment Study is complete which addresses the potential to utilize the North Basin of Sooke Lake Reservoir to reduce summer water temperature and the potential for algal blooms to affect water taste and odour, and increase the amount and redundancy of water available to the supply system.
- The ability of the deeper north basin of Sooke Lake Reservoir, as well as the sills between the basins in the reservoir, to buffer the effects of turbidity in stream inflows during storm events and minimize turbidity at the southern water intake.
- The potential to supplement Sooke Lake Reservoir with water from the Leech River watershed.
- The collection of data in support of a future circulation model for Sooke Lake Reservoir to better understand the effect of water temperature, inflows, seasonal factors and circulation on reservoir water quality over seasons and across the depth and extent of Sooke Lake Reservoir.
- Continuous improvements in wildfire prevention, preparedness, detection, suppression, post-wildfire rehabilitation capability and forest fuel management.
- The drainage structure replacement program in the GVWSA that is steadily replacing the carrying capacity of culverts and bridges to meet higher peak flows anticipated from climate change.
- The ongoing monitoring and assessment of water use in the Regional Water Supply System and how this may change in the future as a way to set demand management priorities.
- Continued improvements in water efficiency, campaigns to encourage summer water conservation, goals and a general declining trend in per capita water use.
- Hydrologic modelling and the commitment to update the RWS Master Plan every 5 years to ensure the capacity of the water supply system is adequate for meeting future water demand.
- Regular reviews and adjustments of the water quality monitoring program to identify and monitor impact of climate change on water quality.
- The ongoing monitoring of forest health and research focused on assessing the potential for insect and disease issues to affect forests in a changing climate.

Current and Potential Climate Change Impacts

- Research partnerships examining the potential effects of climate change on forests and wildfire in the GVWSA and the potential for active forest management to reduce risk.
- The ongoing CRD dam safety program continues to consider climate change including the impacts on the Probable Maximum Precipitation and Probable Maximum Flood calculations and their potential effects on existing works (e.g. spillway capacity) and reservoir operating rules.

Operations

- A Drinking Water Safety plan has been developed that identifies potential vulnerabilities in the regional water supply system that relate to weather events; and initiatives to mitigate the vulnerabilities are identified and scheduled for completion.
- Increased and improved monitoring of precipitation and stream flow is being undertaken to better forecast and understand the effects of major precipitation events and prepare the system for these events.
- A risk management approach to any changeover to the Goldstream Water Supply System that carefully considers weather forecasts to reduce the chance of spikes in turbidity entering the water treatment facilities.
- Rainfall shutdown and erosion control requirements for all work in the GVWSA; water quality protection plans required for all projects in or near source water.
- An increase in the capacity of the water disinfection process to accommodate greater future water demand.
- An increased focus on preventative maintenance in the water supply system.
- The ongoing danger tree assessment and removal program around infrastructure and facilities.



Capital Regional District

HOTSHEET AND ACTION LIST

Saanich Peninsula Water Commission

Thursday, March 16, 2023

9:30 AM

Meeting Room
Sidney Community Safety Building
2245 Oakville Ave.
Victoria, BC

The following is a quick snapshot of the FINAL Saanich Peninsula Water Commission decisions made at the meeting. The minutes will represent the official record of the meeting. A name has been identified beside each item for further action and follow-up.

3. ADOPTION OF MINUTES

That the minutes of the January 19, 2023 meeting be adopted.

CARRIED

7. COMMISSION BUSINESS

THE FOLLOWING REPORTS WERE RECEIVED FOR INFORMATION

- 7.1 Saanich Peninsula Water Service Projects and Initiatives Update
- 7.2 Summary of Recommendations from Other Water Commissions
- 7.3 Water Watch Report

Actions:

- The Chair requested a timeline reference showing where projects are being delayed, i.e. staffing, consulting, material delays etc.

I. Jesney



Capital Regional District

HOTSHEET AND ACTION LIST

Juan de Fuca Water Distribution Commission

Tuesday, March 7, 2023

12 PM

Goldstream Meeting Room
479 Island Highway
Victoria, BC

The following is a quick snapshot of the FINAL Juan de Fuca Water Distribution Commission decisions made at the meeting. The minutes will represent the official record of the meeting. A name has been identified beside each item for further action and follow-up.

3. ADOPTION OF MINUTES

That the minutes of the January 3, 2023 meeting be adopted.

CARRIED

7. COMMISSION BUSINESS

The following reports were received for information:

- 7.1. Juan de Fuca Water Distribution Service Capital Projects Update
- 7.2. Summary of Recommendations from Other Water Commissions
- 7.3. Water Watch Report

CAPITAL REGIONAL DISTRICT - INTEGRATED WATER SERVICES**Water Watch**

Issued April 11, 2023

Water Supply System Summary:**1. Useable Volume in Storage:**

Reservoir	April 30 5 Year Ave		April 30/22		April 9/23		% Existing Full Storage
	ML	MIG	ML	MIG	ML	MIG	
Sooke	91,888	20,215	92,727	20,400	92,727	20,400	100.0%
Goldstream	8,200	1,804	9,825	2,162	9,906	2,179	99.9%
Total	100,087	22,019	102,552	22,561	102,633	22,579	100.0%

2. Average Daily Demand:

For the month of April	105.2 MLD	23.14 MIGD
For week ending April 09, 2023	105.8 MLD	23.28 MIGD
Max. day April 2023, to date:	108.4 MLD	23.85 MIGD

3. Average 5 Year Daily Demand for April

Average (2018 - 2022)	114.1 MLD ¹	25.11 MIGD ²
-----------------------	------------------------	-------------------------

¹MLD = Million Litres Per Day ²MIGD = Million Imperial Gallons Per Day**4. Rainfall April:**

Average (1914 - 2022):	88.8 mm
Actual Rainfall to Date	38.4 mm (43% of monthly average)

5. Rainfall: Sep 1- Apr 9

Average (1914 - 2022):	1,445.4 mm
2022/2023	930.0 mm (64% of average)

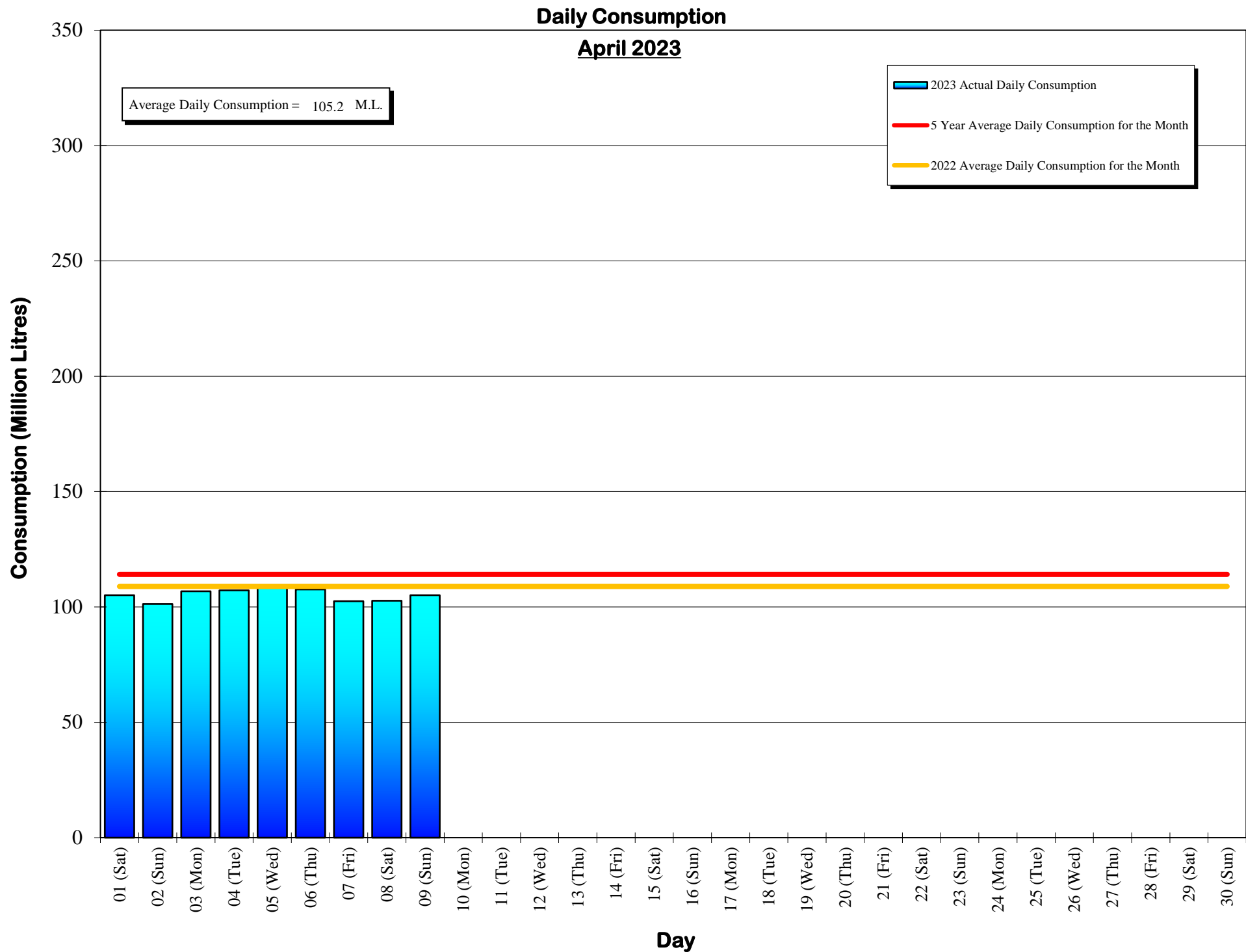
6. Water Conservation Action Required:

If each of us saves a little, together we can save a lot.
Visit our website at www.crd.bc.ca/water for more information.

If you require further information, please contact:

Ian Jesney, P. Eng.
Acting General Manager, CRD - Integrated Water Services
or
Glenn Harris, Ph D., RPBio
Senior Manager - Environmental Protection

Capital Regional District Integrated Water Services
479 Island Highway
Victoria, BC V9B 1H7
(250) 474-9600



Daily Consumptions: - April 2023

Date	Total Consumption		Air Temperature @ Japan Gulch		Weather Conditions	Precipitation @ Sooke Res.: 12:00am to 12:00am			
	(ML) ^{1.}		(MIG) ^{2.}			High (°C)	Low (°C)	Rainfall (mm)	Snowfall ^{3.} (mm)
01 (Sat)	105.1		23.1	7	2	Cloudy / P. Sunny / Showers	7.6	0.0	7.6
02 (Sun)	101.3	<=Min	22.3	7	1	Cloudy / Showers	7.1	0.0	7.1
03 (Mon)	106.8		23.5	10	1	Cloudy / Showers	0.3	0.0	0.3
04 (Tue)	107.2		23.6	9	-1	Cloudy / P. Sunny / Flurries	0.3	10.1	1.3
05 (Wed)	108.4	<=Max	23.8	10	0	Cloudy	0.0	0.0	0.0
06 (Thu)	107.6		23.7	10	5	Cloudy / Showers	1.0	0.0	1.0
07 (Fri)	102.5		22.6	13	6	Sunny / P. Cloudy / Showers	1.0	0.0	1.0
08 (Sat)	102.7		22.6	9	5	Cloudy / Showers	1.8	0.0	1.8
09 (Sun)	105.1		23.1	11	5	Cloudy / Rain	18.3	0.0	18.3
10 (Mon)									
11 (Tue)									
12 (Wed)									
13 (Thu)									
14 (Fri)									
15 (Sat)									
16 (Sun)									
17 (Mon)									
18 (Tue)									
19 (Wed)									
20 (Thu)									
21 (Fri)									
22 (Sat)									
23 (Sun)									
24 (Mon)									
25 (Tue)									
26 (Wed)									
27 (Thu)									
28 (Fri)									
29 (Sat)									
30 (Sun)									
TOTAL	946.7 ML		208.3 MIG				37.4	10	38.4
MAX	108.4		23.85	13	6		18.3	10	18.3
AVG	105.2		23.14	9.6	2.7		4.2	1	4.3
MIN	101.3		22.28	7	-1		0.0	0	0.0

1. ML = Million Litres

2. MIG = Million Imperial Gallons

3. 10% of snow depth applied to rainfall figures for snow to water equivalent.

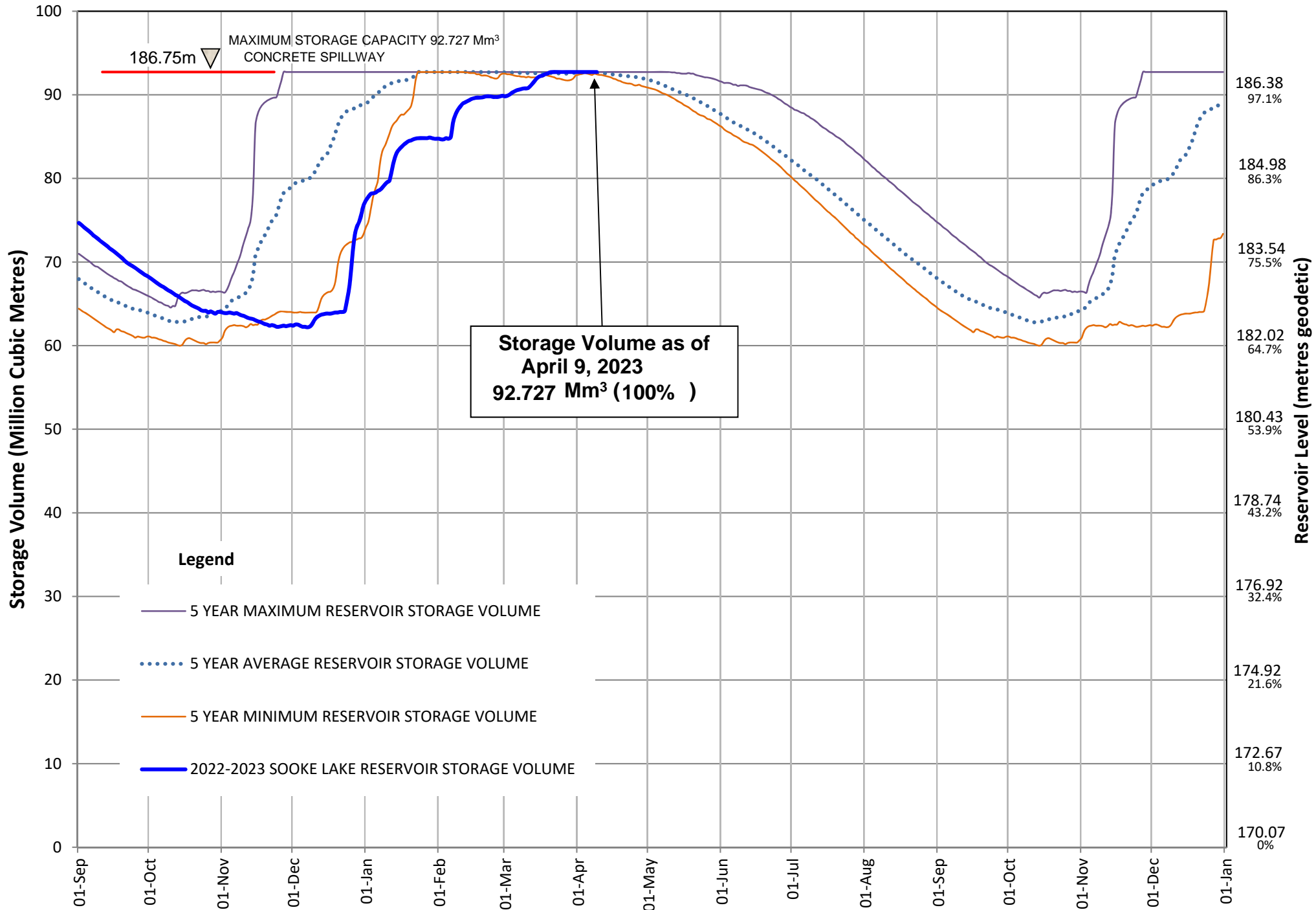
Average Rainfall for April (1914-2022)	88.8 mm
Actual Rainfall: April	38.4 mm
% of Average	43%
Average Rainfall (1914-2022): Sept 01 - Apr 09	1,445.4 mm
Actual Rainfall (2022/23): Sept 01 - Apr 09	930.0 mm
% of Average	64%

Number days with precip. 0.2 or more
8

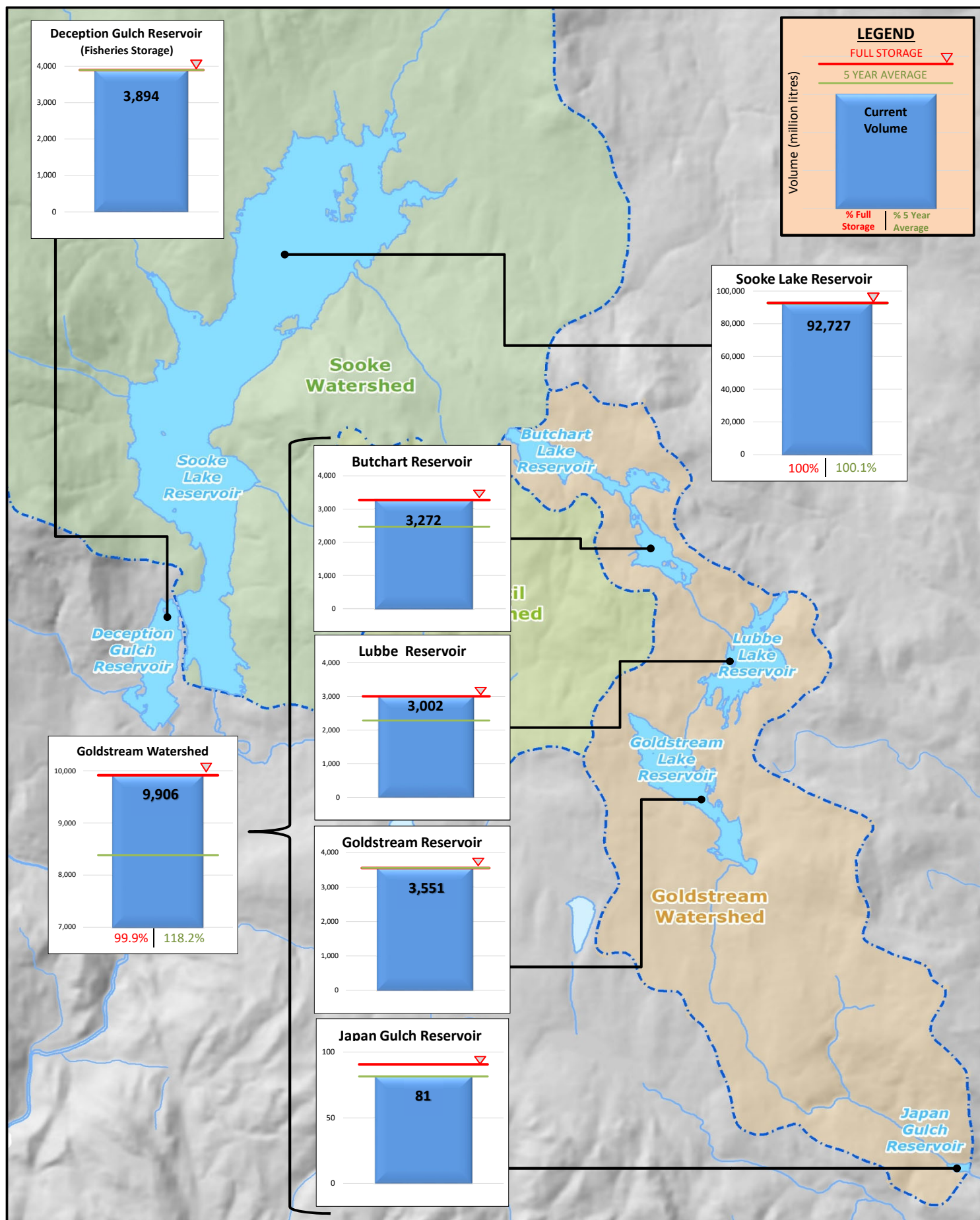
Water spilled at Sooke Reservoir to date (since Sept. 1) = 0.38 Billion Imperial Gallons
= 1.70 Billion Litres

SOOKE LAKE RESERVOIR STORAGE SUMMARY

2022 / 2023

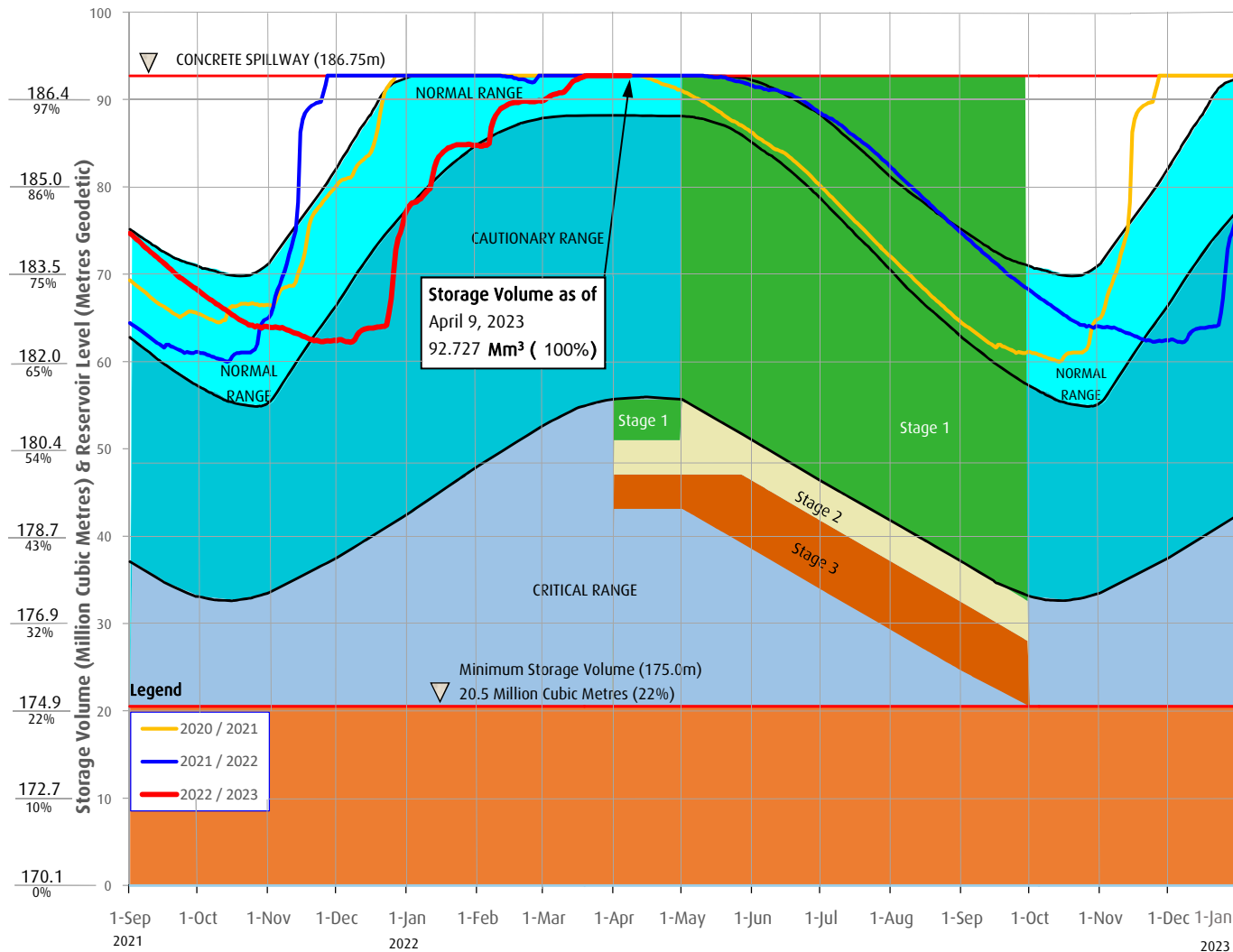


Useable Reservoir Volumes in Storage for April 09, 2023



Sooke Lake Reservoir Storage Level

Water Supply Management Plan



FAQs

How are water restriction stages determined?

Several factors are considered when determining water use restriction stages, including,

1. Time of year and typical seasonal water demand trends;
2. Precipitation and temperature conditions and forecasts;
3. Storage levels and storage volumes of water reservoirs (Sooke Lake Reservoir and the Goldstream Reservoirs) and draw down rates;
4. Stream flows and inflows into Sooke Lake Reservoir;
5. Water usage, recent consumption and trends; and customer compliance with restriction;
6. Water supply system performance.

The Regional Water Supply Commission will consider the above factors in making a determination to implement stage 2 or 3 restrictions, under the Water Conservation Bylaw.

At any time of the year and regardless of the water use restriction storage, customers are encouraged to limit discretionary water use in order to maximize the amount of water in the Regional Water Supply System Reservoirs available for nondiscretionary potable water use.

Stage 1 is normally initiated every year from May 1 to September 30 to manage outdoor use during the summer months. During this time, lawn watering is permitted twice a week at different times for even and odd numbered addresses.

Stage 2 is initiated when it is determined that there is an acute water supply shortage. During this time, lawn water is permitted once a week at different times for even and odd numbered addresses.

Stage 3 is initiated when it is determined that there is a severe water supply shortage. During this time, lawn watering is not permitted. Other outdoor water use activities are restricted as well.

For more information, visit www.crd.bc.ca/drinkingwater

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