Staff Report
Request For Decision

TO: Special Committee of the Whole – July 17, 2025

AUTHOR: Remko Rosenboom, General Manager, Infrastructure Services

SUBJECT: **WATER SUPPLY CAPACITY: UPDATED OBJECTIVES AND SCENARIO ANALYSIS**

OVERVIEW

The purpose of this report is to seek Board direction on water supply objectives in anticipation of an updated draft Water Strategy, and to provide an updated strategic water supply expansion scenario analysis. This report requests Board decision to accept, reject, or provide alternate direction with respect to staff's recommendations as presented below.

Recommendation(s):

THAT the following water supply objectives be incorporated in the draft 2025-2035 Water Strategy and presented at a future Committee meeting:

1) **the water supply capacity for all systems is such that an average monthly residential water demand of 750 litres per connection can be guaranteed during an extended dry summer (May 1 – November 31) with only Stage 1 or Stage 2 Water Conservation Regulations being implemented;**

2) **the emergency water supply capacity for the water systems is based on a residential demand of 350 litres per residential connection;**

3) **the water supply capacity is adequate to ensure regulatory compliance related to the Environmental Flow Needs (EFN) requirements for Chapman Creek and Soames Creek.**

BACKGROUND

At the January 13, 2025 Finance Committee meeting, staff presented a report titled Strategic Water Supply Expansion Scenarios Analysis. The purpose of that report was to provide a status update on each of the water supply expansion projects that the Sunshine Coast Regional District (SCRD) is working on, and to assess when and how they - individually and combined - could contribute to improving the current water supply situation for the Chapman Water System.

Since this report was published new information on some of these projects was presented to the Board, including the results of the most recent test well drilling program, the Gray Creek hydrological feasibility study, the emergency Siphon Systems at Chapman Lake and Edwards Lake, and the Lower Crown Reservoir.

The draft 2025-2035 Water Strategy (Water Strategy) as presented to the Board on March 24, 2024, had no specific water objectives included. Going forward, including such objectives would confirm the service levels the SCRD is aiming for in terms of supply capacity, and assist in guiding the design requirements of the supporting infrastructure.

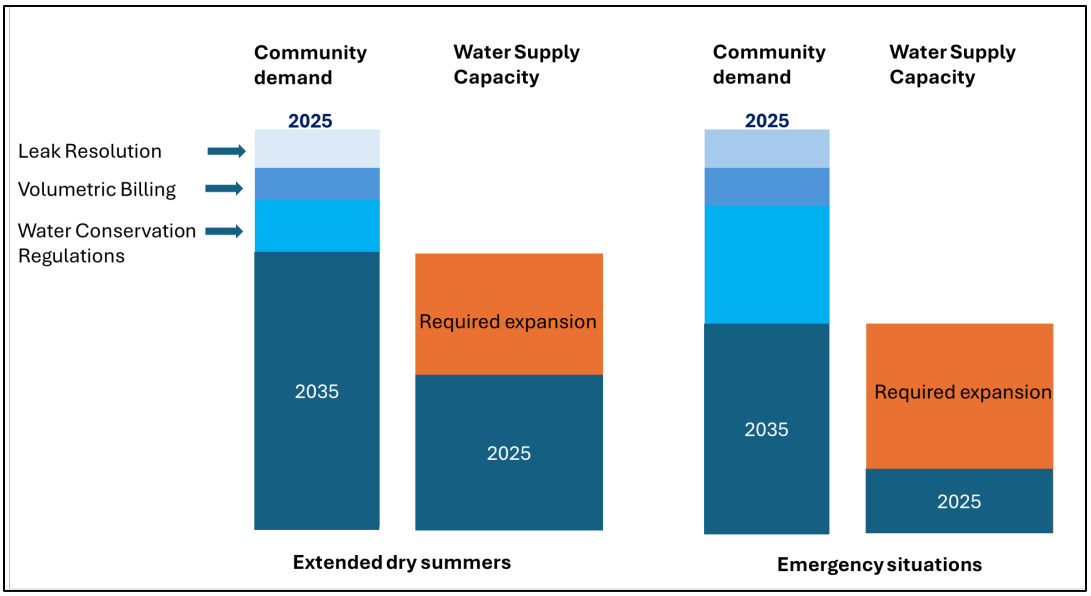
The following draft objectives were used for the analysis presented in the above-mentioned staff report:

1. Ensuring a sufficient water supply if there was a period with very minimal rain between May 1 and November 31.
2. Ensuring a basic water supply to all users in case of an emergency situation where Chapman Creek can no longer be used as a source and/or the Chapman Water Treatment Plant has failed.
3. Ensuring regulatory compliance for the full duration related to the Environmental Flow Needs (EFN) requirements for Chapman Creek.

For this analysis an average annual growth rate of 2% was assumed.

The relation between these two objectives and how they could hypothetically be achieved is presented in Figure 1.

Figure 1: Note this graph is not based on actual data from any of the SCRD's water systems.



DISCUSSION

Water Supply Objectives

Effective water objectives need to be specific and quantified to guide decision making and operations. Staff have conducted additional analyses and reviews and have now developed updated draft water objectives for the Board's consideration. Water supply objectives are currently proposed based only on the residential demand, and not on commercial and institutional water demand, as residential water demand is the primary driver in determining water supply capacity and the proposed objectives will provide sufficient guidance to staff to design such infrastructure. Of particular note, and to be taken into consideration with respect to the objectives, is that the SCRD has EFN requirements included in its water licences for both Chapman Creek and Soames Creek. For Chapman Creek they are 200 litres per second, and for Soames Creek, they vary between 15.5 and 22.7 litres per second depending on the time of year.

Additional water supply objectives are expected to be introduced later based on updated and expanded data analysis.

Recommended Objectives

1. Ensure that the water supply capacity is able to meet the community demand if there was a period with very minimal rain between May 1 and November 31, and Water Conservation Regulations are in place comparable with the current Stage 2.

This objective would provide guidance on the design of the water supply capacity required and any associated infrastructure, and inform the minimum water supply capacity each water system would require to be operational during the period between May 1 and November 31.

This water objective is an average residential water demand objective used for the design of infrastructure. Staff would be able to confirm the amount of additional water supply capacity required in each water system.

This objective could be met by a combination of increasing the water supply capacity and more efficient use of water. It's therefore important to note that more efficient use of water is a key pillar of the Water Strategy and the water efficiency messaging included in the most recent "Get Ready for Summer" campaign will, therefore, stay unchanged.

Figure 2 presents the average monthly residential water demand for the period of 2019-2023 based on the water meter data available during that period.

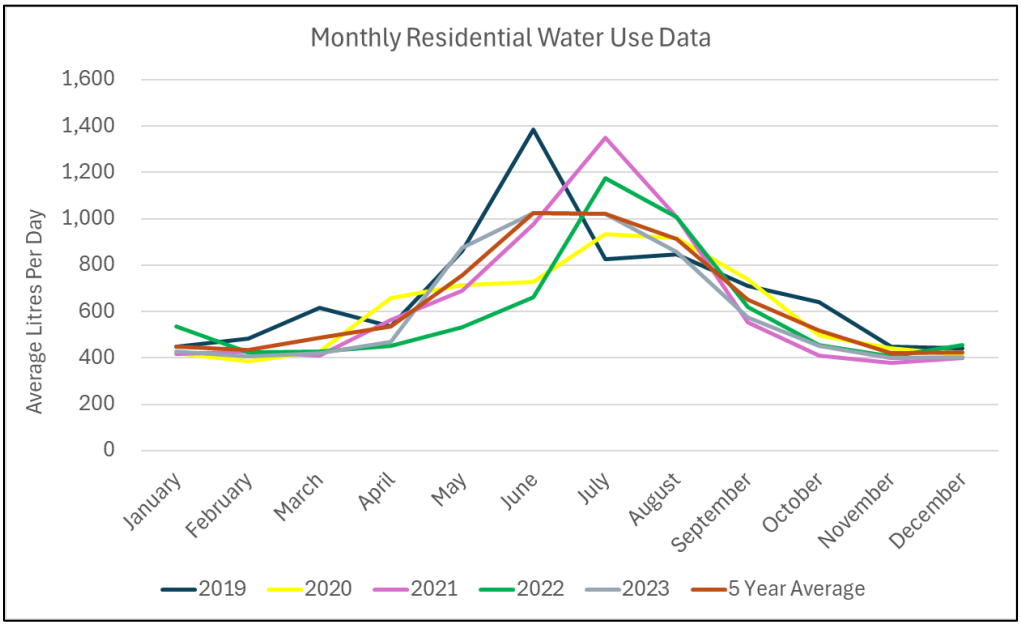


Figure 2: Average monthly water residential use for 2019-2023 period.

It is anticipated that the introduction of volumetric billing and ongoing resolution of leaks on private properties and within the SCRD's distribution systems could result in a reduction in demand of between 20% and 30% compared to 2023.

During the core summer months (July - August), with predominantly only Stage 1 Water Conservation Regulations in place, the average monthly residential demand spiked to 1,200 litres per connection in July 2022, and 1,350 litres per connection during 2021. The financial, technical, and operational implications of expanding the water supply capacity to sustain such a high demand during an extended dry summer are very substantial. It is therefore not recommended to set a water supply objective for the summer months based on only Stage 1 Water Conservation Regulations being in place.

During months when Stage 2 Water Conservation Regulations were in effect in the Chapman Water System the average monthly residential demand for all systems combined did not exceed 1,000 litres per connection during the core summer months (July - August).

As previously stated, the reduction in water demand due to efficiency measures are expected to be between 20% and 30%. It is therefore likely that if capacity increased to meet an average monthly residential demand of 750 litres per connection there would be no need to implement other Water Conservation Regulations beyond those of Stage 2.

An objective below the average monthly 750 litres per connection is not realistic to be achieved within the next 5 years by the implementation of the volumetric billing and leak resolution programs as currently intended and only Stage 2 Water Conservation Regulations. A substantially lower objective can only be achieved during extreme dry

summer by implementing Stage 4 Water Conservation Regulation for most of the summer.

While implementing such a target would still have substantial financial, technical and operational implications, the scenario analysis included in this report indicate that there are several options to meet this objective with the water supply expansion projects currently considered.

Staff therefore recommend the Water Strategy include the objective that the water supply capacity for all systems reflect an average monthly residential use of 750 litres per connection during an extended dry summer, and with only Stage 1 or Stage 2 Water Conservation Regulations being implemented.

Staff recommend reviewing this Water Supply Objective in 2030 as the effectiveness of the Volumetric Billing Program and leak resolution should then be apparent.

This objective would be used to design the water supply capacity for each of the water systems. For some systems the current supply capacity might already exceed this objective, while for others, additional supply capacity would need to be created.

While the SCRD intends to increase the water supply capacity for the Eastbourne Water System with the current water supply expansion project for that system, achieving this target might not be technically feasible or desired by the system users. Further engagement with those users would be required to confirm the desired summer water supply capacity for that system.

2. Ensure that the water supply capacity is sufficient to provide a basic amount of water to all water system users in emergency circumstances.

This objective would provide guidance to the design of the water supply capacity required and any associated infrastructure. If the primary water source is out of commission as the result of an emergency event, this objective would inform the minimum water supply capacity that would need to be available in a water system.

Emergency situations, such as a natural disaster or major incident that could result in one or more water supply sources to be out of commission, could include earthquakes, storms, pollution of water sources, or equipment failure. Addressing the implications of such a situation could take a substantial amount of time and, given the size of most of the SCRD water systems, alternative means of water supply via the SCRD's water distribution system should be considered as the only viable means of providing a basic water supply to the users. The draft Water Strategy includes actions to complete a risk assessment of critical infrastructure and subsequently update the emergency response plans for all water systems.

An analysis was conducted to establish a base residential use for all SCRD water systems during emergency situations. During the winter months of the period 2019-2023 the average monthly residential demand was usually just above 400 litres per connection. During emergency situations the community should be able to reduce that demand further - supported by additional water use restrictions, enforcement, and communication. Therefore, the recommended emergency water supply capacity for the water systems is based on a demand of 350 litres per residential connection. This objective could be reevaluated in 2030 after several years of water meter data being available from all connections on the water systems. Of particular relevance is that the average winter use by currently unmetered users (i.e. the District of Sechelt) is expected to be higher than current available data considered, due to a higher number of people per household within these unmetered areas.

As the population during the winter months is lower than during other times of the year, this implies that during periods with an increased population on the coast, the actual available water supply to each residential connection would be lower.

For some of the smaller water systems, achieving this objective might not be realistic, including for Egmont, Cove Cay, and Eastbourne. In these cases, the water distribution system might not be the only viable way of providing water to the residential users for an extended period, and alternative objectives are to be confirmed during the implementation of the Water Strategy.

3. Ensuring regulatory compliance for the full duration related to the Environmental Flow Needs (EFN) requirements.

The SCRD has EFN requirements included in its Water Licences for both Chapman Creek and Soames Creek. For Chapman Creek they are 200 litres per second and for Soames Creek they vary between 15.5 and 22.7 litres per second depending on the time of the year. The technical implications of these requirements is that besides the community demand, the design of the infrastructure and the operations of these water sources would also need consider the flows required to meet these EFN requirements.

In Summary

The figure below depicts the above proposed water supply objectives 1 and 2 with the 2019-2023 residential water demand date presented in Figure 2.

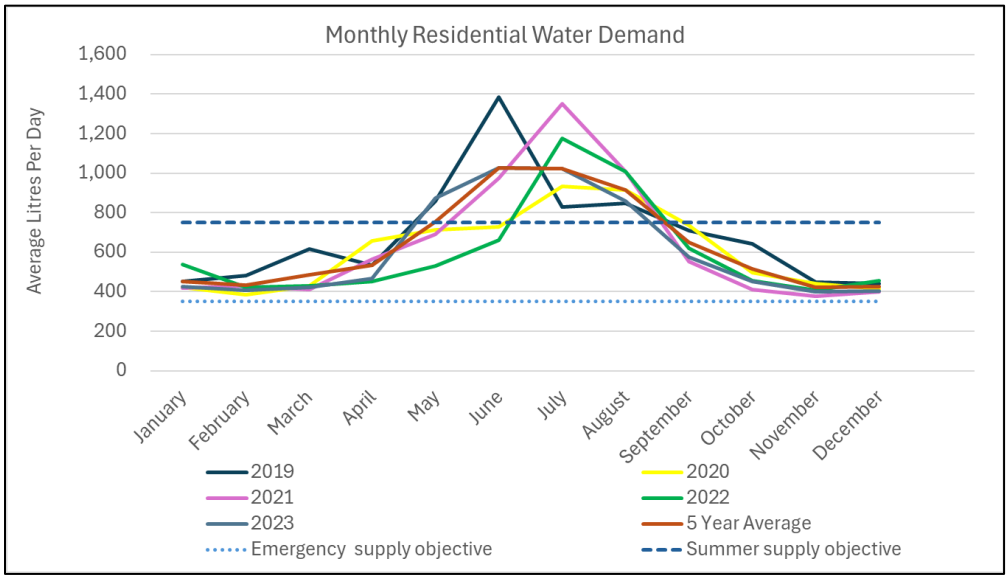


Figure 3: Average monthly water residential use for 2019-2023 period with proposed water supply objectives.

Water Supply Scenario Analysis

Attachment A provides a detailed status update of all the current SCRD initiatives focused on improving the water supply for the Chapman Water System.

Staff used the same Water Supply and Water Demand Model as in the original scenario analysis to assess the degree to which each combination of the water supply expansion projects listed in Attachment A could contribute to achieving the water supply objectives outlined above.

Using this model, staff analyzed which combination of water supply sources would result in meeting the water supply objectives as described above. Each combination of new supply sources that would meet these objectives is considered a scenario. Table 1 lists the scenarios (combinations of water supply sources) that would meet these water supply objectives.

The following should be noted regarding the analyses conducted:

1. The analysis contemplates a 10-year time horizon of 2035 as this is the term set out in the draft Water Strategy.
2. This analysis has been completed with a conservative water efficiency gain of 20% from 2031 onwards, resulting from the continuation of the leak resolution program and the implementation of volumetric billing. Should these initiatives be significantly efficient it could result in a 30% reduction of residential water demand.
3. The storage capacity for the Lower Crown Raw Water Reservoir used in this analysis is updated to 900,000 m^3. The Lower Crown Raw Water Reservoir's functionality as an emergency water supply source for Chapman Creek is dependent on whether the Chapman Creek Water Treatment Plant is also impacted by an emergency. If the

treatment plant is not impacted, the Lower Crown Raw Water Reservoir could be used as an emergency water source for a period of several days, and up to a month, depending how much water is stored in it at the time of the emergency.

4. The development of the Sechelt | shíshálh Hospital well site is included. Phase 1 would result in an additional capacity of 74 l/s, and Phase 2 could result in an additional capacity of 113 l/s.
5. The estimated combined annual additional operating cost per cubic meter for the additional water supply sources are categorized as follows:
    i. Low $0.00 - $0.50
    ii. Moderate $0.50 - $1.00
    iii. High $1.00 - $1.50
    iv. Very High >$1.50
6. The estimated combined development costs for the SCRD associated with these projects are categorized as follows:
    i. Low $0M - $5M
    ii. Moderate $5M - $10M
    iii. High $10M - $15M
    iv. Very High $15M - $20M

Table 1: Feasible water supply expansion scenarios for target year 2035 (superscripts are referring to the comments above).

	Scenario A	**Scenario B**	**Scenario C**	**Scenario D**	**Scenario E**	**Scenario F**	**Scenario G**	**Scenario H**
Siphon Systems					X	X	X	X
EFN-Optimization	X	X	X	X	X	X	X	X
Leak Resolution[2]	X	X	X	X	X	X	X	X
Volumetric Billing[2]	X	X	X	X	X	X	X	X
Langdale Wellfield	X		X		X		X	
Lower Crown Raw Water Reservoir[3]	X	X			X	X		
Hospital Wellfield – Phase 1[5]		X	X	X		X	X	X
Hospital Wellfield – Phase 2[5]				X		(X)	(X)	X

Table 2 presents how each of these scenarios could result in water supply objectives being met, an indication of the combined operating and capital costs associated with each scenario, as well as the potential timeline for respective implementation.

Table 2: Implications of water supply expansion scenario analysis for target year 2035.

	Scenario A	**Scenario B**	**Scenario C**	**Scenario D**	**Scenario E**	**Scenario F**	**Scenario G**	**Scenario H**
Summer Water Supply Objective	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-round Redundancy Objective	Yes/No[3]	Yes/No[3]	Yes	Yes	Yes/No[3]	Yes/No[3]	Yes	Yes
EFN-Requirement Objective	No	No	No	No	Yes	Yes	Yes	Yes
Combined Operating Costs[6]	Very High	High	Moderate	Low/ Moderate	Very High	High	Moderate	Low/ Moderate
Combined Development Costs[7]	High	Moderate	Very High	Moderate	High	Moderate	Very High	Moderate
All Sources Could be Operational By	2028	2028	2028	2028-2030	2028	2028	2028	2028-2030

The primary findings of this analysis are:

1. During a six-month drought period the EFN requirements for Chapman Creek can only be adhered to by using both syphon systems at Edwards Lake and Chapman Lake.
2. There are four scenarios to meet all the draft water supply objectives as illustrated above. Three of these scenarios could be fully implemented by 2028 at the earliest. Scenario H could be fully implemented as soon as 2030.
3. Each of the water supply sources still have several critical dependencies that could result in certain scenarios being no longer feasible. The primary dependencies are listed in the following table:

	Critical Dependency	**Anticipated Timeline**
Langdale Wellfield	Electoral assents process on funding for construction phase	2025
	Land-ownership wellfield	2026
	Support by Sḵwx̱wú7mesh Nation	2026
	Water Licence	2026
Lower Crown Raw Water Reservoir	Agreements shíshálh Nation – SCRD and associated electoral assent process	2025 or 2026
	Water Licence Amendment	2026
Sechelt | shíshálh Hospital Wellfield Phase 1	Funding confirmation for remaining feasibility components	2026
	Land-use agreement wellfield	2026
	Support by shíshálh Nation	2026
	Water Licence	2026
	Funding confirmation for design and construction phase	2027

OPTION 1 – Include proposed Water Supply Objectives in Water Strategy

This option would have staff include the water supply objectives as proposed in this report in an updated Water Strategy to be presented to the Board at a future Committee meeting.

Financial and Organizational Considerations

Including these objectives in the Water Strategy will not have any financial or organizational implications. Each of the projects required for the implementation of these objectives have implications that are or will be confirmed as part of associated staff reports, as well as with the future Water Infrastructure Master Plan and Water Efficiency Plan.

Staff Recommendation

Staff recommend this option. Should the Committee choose to go with Option 1, a recommendation could be considered as provided in the Overview section on page one of this report.

OPTION 2 – Undertake further analysis

This option would have the Board provide specific guidance to staff on the particulars of the water supply objectives to be included in the Water Strategy.

Financial and Organizational Considerations

The financial and organizational implications of this option are dependent on the nature of the direction provided to staff to update the water supply objectives.

Staff Recommendation

Staff do not recommend this option. Should the Committee choose to go with Option 2, a recommendation could be considered as follows:

> THAT staff present updated Water Supply Objectives to the Board that consider the following:
>
> 1. (*Board to fill in guidance to staff)*

FINANCIAL AND ORGANIZATIONAL IMPLICATIONS

Including objectives in the Water Strategy will not have any financial or organizational implications. The detailed implications related to implementation of these objectives are, or will be, confirmed as part of staff reports associated with these projects and a future Water Infrastructure Master Plan and Water Efficiency Plan.

STRATEGIC PLAN AND RELATED POLICIES

This staff report is aligned with the Board's service delivery focus area of Water Stewardship: Continue to explore, enhance, and develop groundwater and surface water sources.

TIMELINE

Based on the direction received by the Board, staff intend to present an updated draft Water Strategy in Q3 or Q4 2025 for the Board's consideration.

CONCLUSION

For water supply objectives to be effective in guiding the SCRD's decision making and operations they need to be specific and quantified. Staff have conducted additional analyses and review and are presenting updated draft water supply objectives for the Board's consideration.

Staff updated the analysis to determine which combination of currently considered water supply projects can achieve the objectives presented in this report.

Attachments:

Attachment A – SCRD's Current Water Supply Expansion Initiatives Status Update

Reviewed by:			
Manager		Finance	
GM		Legislative	X-S. Reid
CAO	X-T. Perreault	Other	

ATTACHMENT A

Sunshine Coast Regional District's Current Water Supply Expansion Initiatives Status Update

Langdale Wellfield

The Board received a comprehensive status update on the Langdale Wellfield Project at the December 12, 2024, Committee of the Whole meeting. During the 2025 Budget Process the Board approved a funding proposal for the final design and construction of this wellfield. The Electoral Approval Process associated with the required long-term loan is scheduled for early fall 2025. The anticipated production capacity of the Langdale Well would be between 50 and 70 litres per second. Permitting and discussions on the land ownership for the terminal for this project are underway and besides the confirmation of funding for the construction phase, there are no substantial potential showstoppers identified for this project.

Project phase	Additional water supplies extended drought (m3)	Development cost ($M)	Operating costs		Earliest completion date	Critical dependencies
			Low	High		
Detailed design	950,000	18.1 (of which 4.9 grant funded)	High	High	2028	Permitting, land ownership wellfield site, funding confirmation

Emergency Siphon Systems at Edwards and Chapman Lakes

Applications to keep the emergency siphon systems at Edwards and Chapman Lakes in place until early October 2025 have been submitted. Additional provincial permits are required for their actual use in 2025 in the years following.

Project phase	Additional water supply extended drought (m3)	Development cost ($M)	Operating costs	Earliest completion date	Critical dependencies
Implementation phase	1,500,000	0	Low	2026	Support from shíshálh Nation and Province

Optimization of the Chapman Creek Environmental Flow Needs (EFN) requirement

The Ministry of Water, Land and Resource Stewardship is expected to support the implementation of a lower EFN during the early summer months of 2026 and 2027 pending the completion of an Adaptive Management Plan and Monitoring Plan in collaboration with the shíshálh Nation and approval from the Department of Fisheries and Oceans. Based on the data collected over this two-year period the Ministry will decide if the EFN requirement for Chapman Creek will be permanently amended.

Project phase	**Additional water supply extended drought (m3)**	**Development cost ($M)**	**Operating costs**	**Earliest completion date**	**Critical dependencies**
Implementation phase	Up to 260,000	0.2-0.4	minimal	2026	Support from shíshálh Nation and, DFO and Province is required for permanent implementation of optimized EFN post 2027

Lower Crown Raw Water Reservoir

The funding for the construction of the Lower Crown Raw Water Reservoir has been confirmed. There is ongoing collaboration between the shíshálh Nation and the SCRD on aspects of the design and operating implications. Legal agreements between the parties and associated electoral approval processes are also essential for the project. Only the currently confirmed development costs for the SCRD associated with this reservoir are presented.

Project phase	**Additional water supply extended drought (m3)**		**Development cost ($M)**		**Operating costs**		**Earliest completion date**	**Critical dependencies**
	Low	**High**	**Low**	**High**	**Low**	**High**		
Detailed design	900,000	1,000,000	0.5	TBC	High	Very high	June 1, 2027	Agreements between SCRD and shíshálh Nation and associated electoral approval process

Sechelt | shíshálh Hospital Wellfield

At the April 10, 2025, Committee of the Whole meeting the results of the drilling and testing of five test wells in the Sechelt area were presented. Subsequently the Board directed staff to further engage with the shíshálh Nation and Vancouver Health and conduct further assessments to confirm the feasibility of Phase 1 of the development of this wellfield.

Project phase	**Additional water supply extended drought (m3)**		**Development Cost ($M)**		**Operating costs**		**Earliest completion date**	**Critical dependencies**
	Low	**High**	**Low**	**High**	**Low**	**High**		
Advanced feasibility study	1,150,000	3,000,000	6	10	Low	Low	2028-2030	Support from shíshálh Nation, VCH, technical feasibility, permitting, and funding confirmation

Volumetric Billing

The implementation of volumetric billing is currently scheduled to be completed by January 1, 2027. The current implementation approach is start with only a small percentage of the rates being dependant on the actual usage and increase this overtime. It could take three to five years for the impact of volumetric billing on the water supply to materialize.

Project phase	**Additional water supply extended drought (m3)**		**Development cost ($M)**	**Operating costs**		**Earliest completion date**	**Critical dependencies**
	Low	**High**		**Low**	**High**		
Development phase	345,000	515,000	Minimal	Low	Low	January 1, 2027	Confirmation of new rate structure and updating Bylaw No. 422

Leak Resolution

Leak resolution is ongoing and evolving regarding leaks on private properties and on SCRD infrastructure. Completion of amendments to *Water Rates and Regulations Bylaw No. 422* in 2025 could further strengthen and clarify our ability to address leaks on private properties.

Project phase	Additional water supply extended drought (m3)		Development cost ($M)		Operating costs		Earliest completion date	Critical dependencies
	Low	High	Low	High	Low	High		
Implementation phase	345,000	515,000	Minimal	Minimal	Low	Low	Ongoing	Updating Bylaw No. 422

Optimization of Water Supply with Town of Gibsons

Conversations to date regarding opportunities to optimize the water exchange between the Chapman Water System and the Town of Gibsons water system are primarily focussed on providing mutual support in emergency circumstances.

The Aquifer 560 Agreement also enables the Town to provide a maximum of 1,500 m3 per day (or a lower amount to avoid exceeding their annual authorized amounts under their Water Licences) to the SCRD when an Emergency Operations Centre (EOC) is activated. The current rate for this is $2.72 per m3 and is confirmed annually.

Project phase	Additional water supply extended drought (m3)		Development cost ($M)		Operating costs		Earliest completion date	Critical dependencies
	Low	High	Low	High	Low	High		
Implementation phase	0	1,500 per day	N/A	N/A	0	Very high	Ongoing	EOC activation

Given that this supply source can only be activated in emergency situations when an EOC is activated, and only could result in a relatively small volume, it has been excluded from the water supply scenario analysis for extended drought situations until this work has progressed.