Innovation. Integrity. Employee-Owned.

Water Use Planning & Management Study

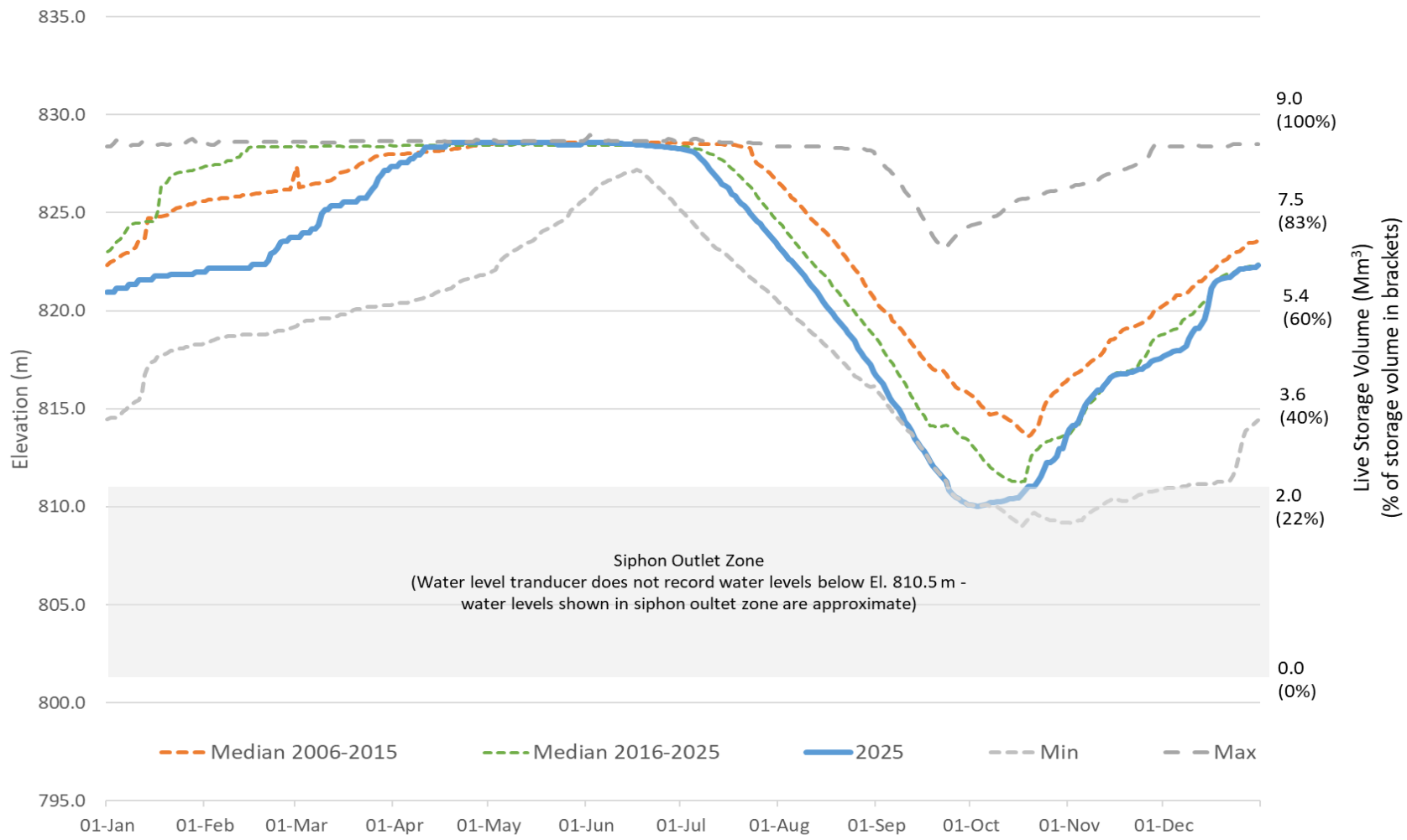
City of Parksville Council Meeting

February 2, 2026

Agenda

- Why is the study important now?
- Project goals
- Phase 1 task review
- Summary of recommended actions
- Next steps – Phase 2

Why is the study important now?



Phase 1 Project Goals as per RFP

PROJECT GOALS

Phase 1 of the project is to undertake a comprehensive assessment of the City's and ERWS's potable water sources, capacity needed to meet future demands, storage feasibility options, additional conservation measures, and hydro power generation options.

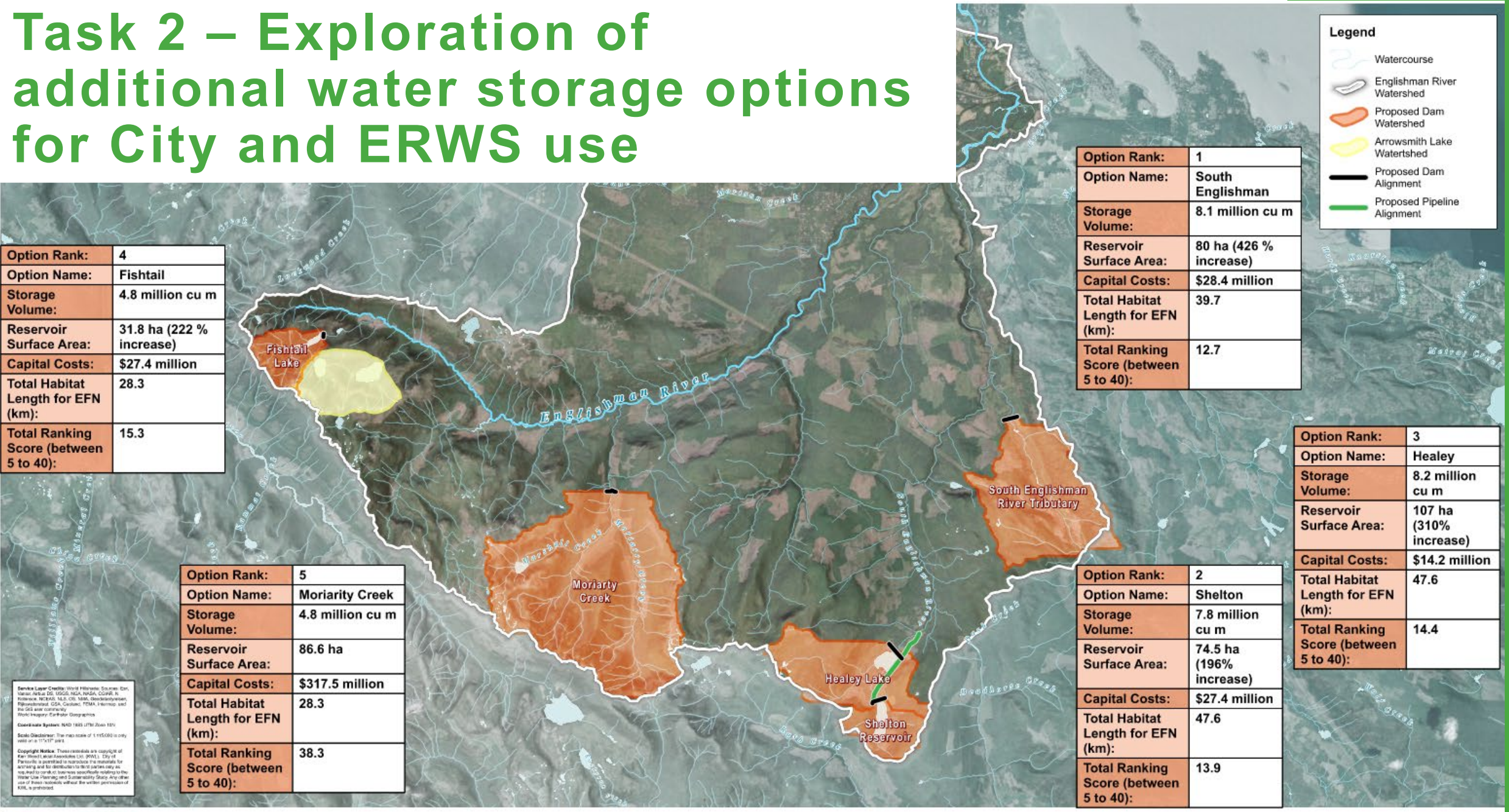
This project will identify and make recommendations to address the resilience of the existing water system, and current/future risks, while considering population growth and the impacts of climate change on Parksville's water system.

Water Supply Reliability = Ability of water systems to meet intended functions under various operating conditions

Task 1 - Review and evaluate current system resiliency and redundancy

- Stage 4 water conservation implemented 4 times in past 5 years
- Arrowsmith Reservoir current reliability at 60%
  (18 out of 30 years on average)
- Preferred target water supply reliability = 97%
  (29 years out of 30 on average)
- Current dam holds 9 Mm^3 – need 2.2 Mm^3 more to meet target reliability (approx. 25% increase)
- Aquifer 216 City groundwater use is 22 – 35 % below annual licensed withdrawal volume limit (withdrawal in operation period near maximum)
- Aquifer 216 health identified to be under “high stress”

Task 2 – Exploration of additional water storage options for City and ERWS use



Option Rank:	4
Option Name:	Fishtail
Storage Volume:	4.8 million cu m
Reservoir Surface Area:	31.8 ha (222 % increase)
Capital Costs:	$27.4 million
Total Habitat Length for EFN (km):	28.3
Total Ranking Score (between 5 to 40):	15.3

Option Rank:	1
Option Name:	South Englishman
Storage Volume:	8.1 million cu m
Reservoir Surface Area:	80 ha (426 % increase)
Capital Costs:	$28.4 million
Total Habitat Length for EFN (km):	39.7
Total Ranking Score (between 5 to 40):	12.7

Option Rank:	3
Option Name:	Healey
Storage Volume:	8.2 million cu m
Reservoir Surface Area:	107 ha (310% increase)
Capital Costs:	$14.2 million
Total Habitat Length for EFN (km):	47.6
Total Ranking Score (between 5 to 40):	14.4

Option Rank:	5
Option Name:	Moriarity Creek
Storage Volume:	4.8 million cu m
Reservoir Surface Area:	86.6 ha
Capital Costs:	$317.5 million
Total Habitat Length for EFN (km):	28.3
Total Ranking Score (between 5 to 40):	38.3

Option Rank:	2
Option Name:	Shelton
Storage Volume:	7.8 million cu m
Reservoir Surface Area:	74.5 ha (196% increase)
Capital Costs:	$27.4 million
Total Habitat Length for EFN (km):	47.6
Total Ranking Score (between 5 to 40):	13.9

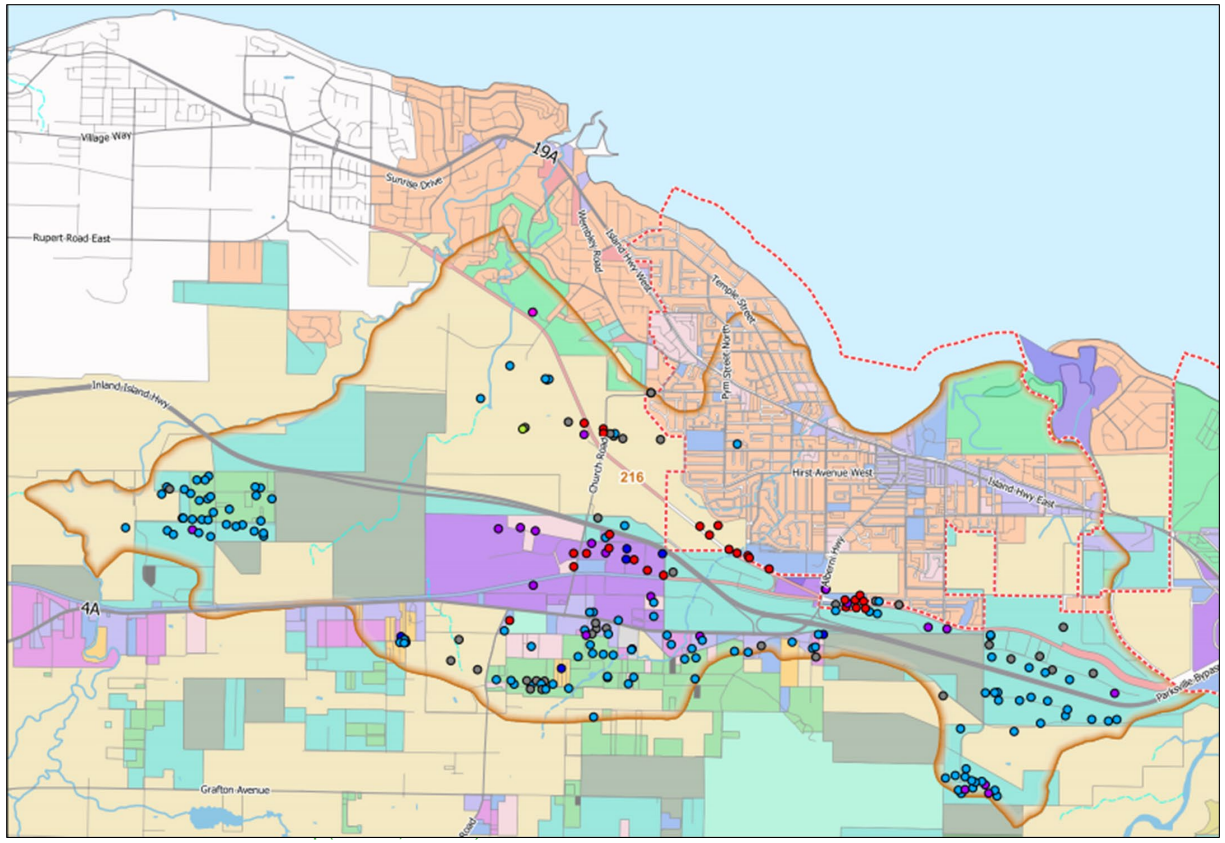
Project No. 2248.018
Date January 2026
Scale 1:115,000
0 1 2 4 km

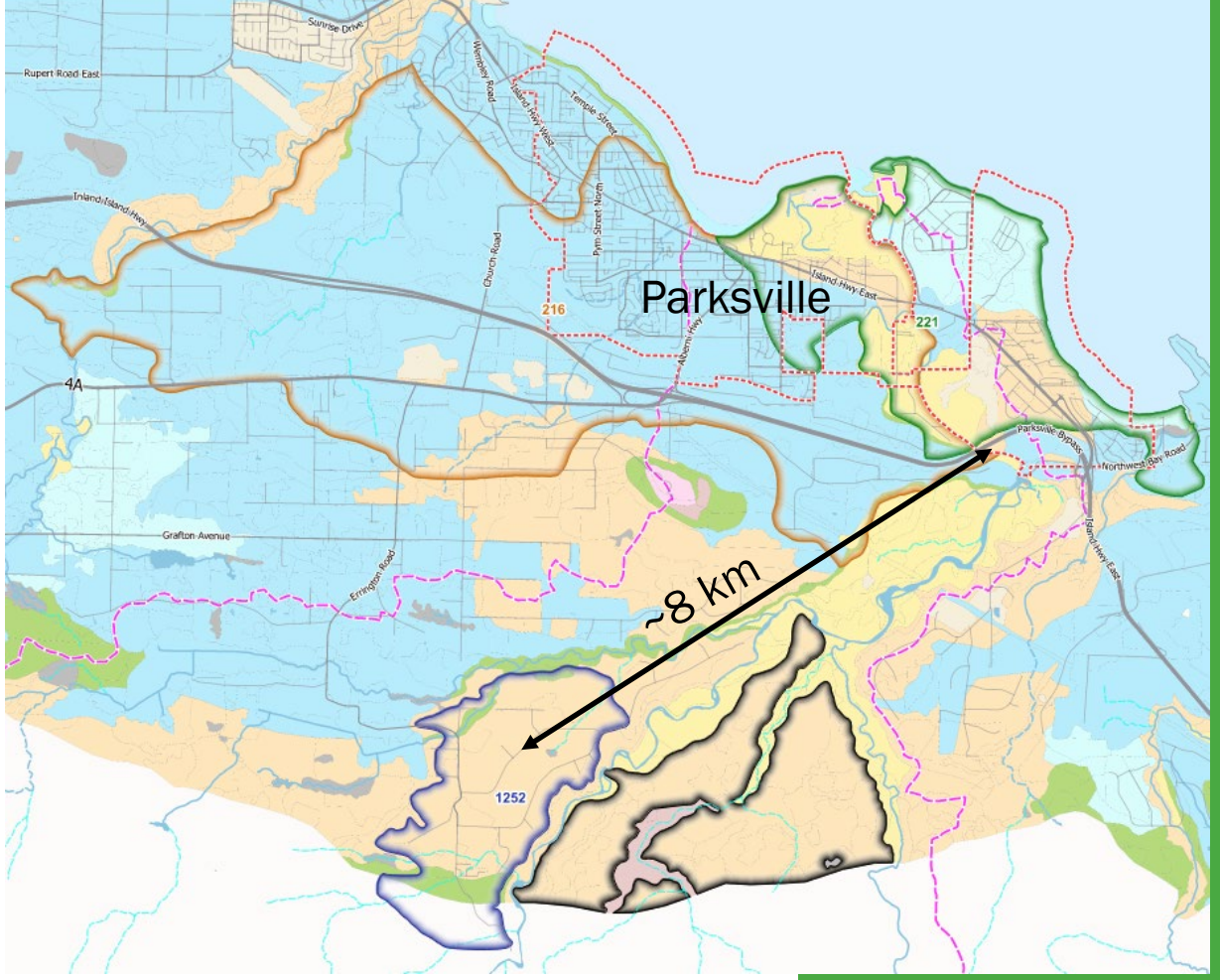
Water Supply Options Overview

Figure 7-11

Task 2 – Exploration of additional water storage options for City and ERWS use

Aquifer 216 – Existing Use





New Groundwater Source Options:

- Aquifer 221 within Parksville's municipal boundary
- Aquifer 1252 located 10 km south of Parksville
- Unmapped aquifer in the South Englishman River sub-watershed.

Task 3 – Exploration of power generation possibilities

Arrowsmith Reservoir

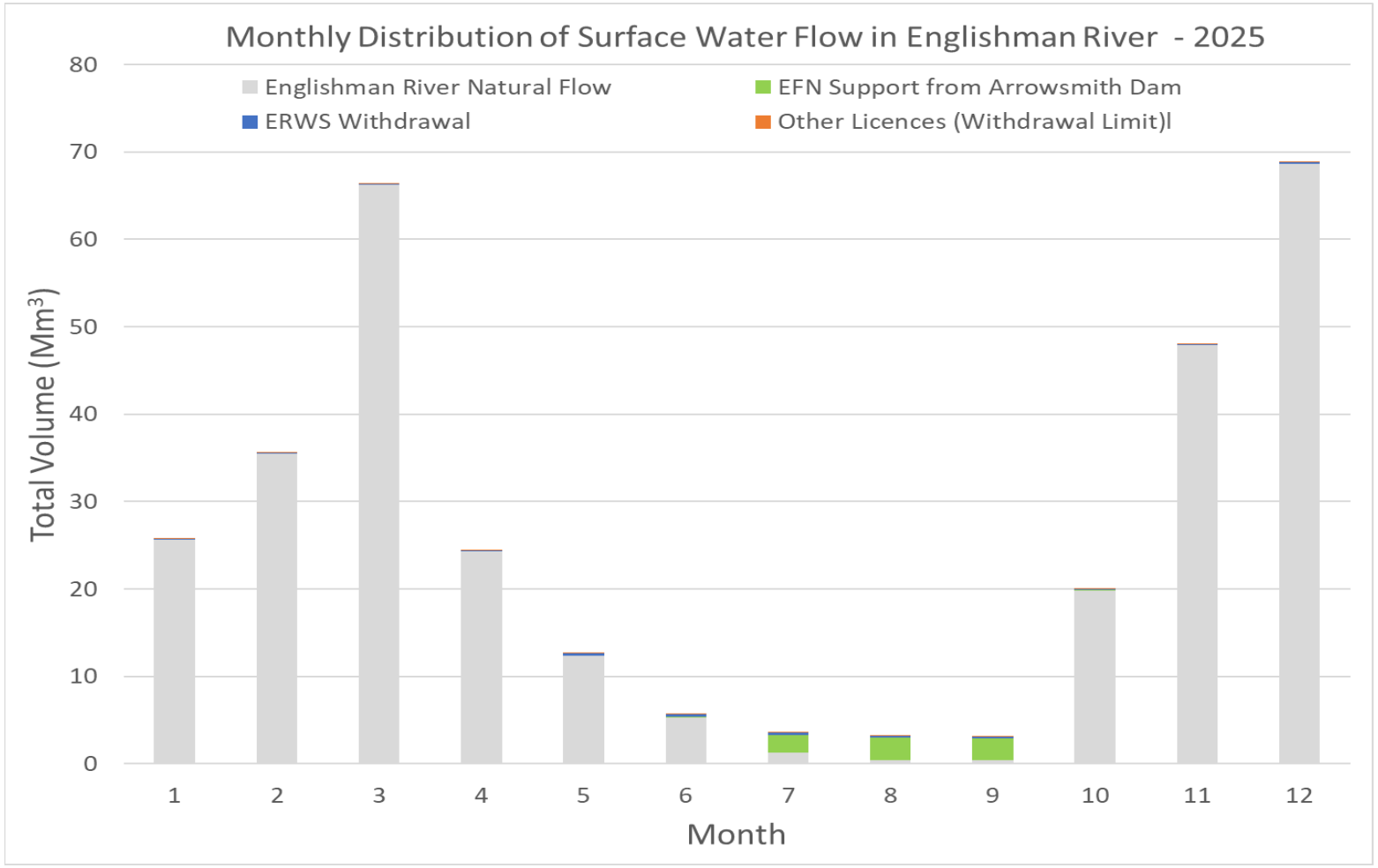
- Hydroelectric power generation not economical due to initial capital cost and long length of transmission power line
- Power generation only available during Operating Period from June to October which is not when BC Hydro needs it
- Hydropower project would provide access to lower 2 Mm^3 and increase reliability of the siphon

Hydroelectric power generation at other sites in Englishman River Watershed deemed not economically feasible

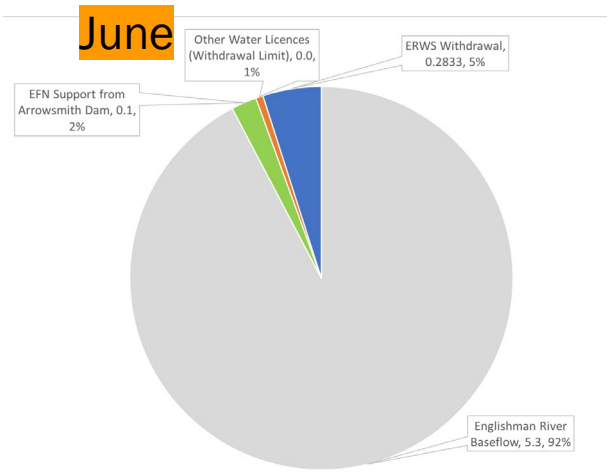
Solar Power

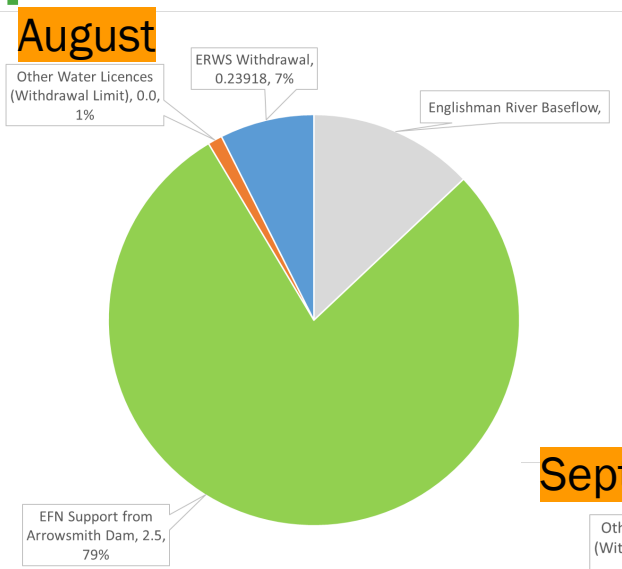
- Reviewed solar power potential at water facilities is viable but recommended to be part of a larger City-wide facility review to be economical

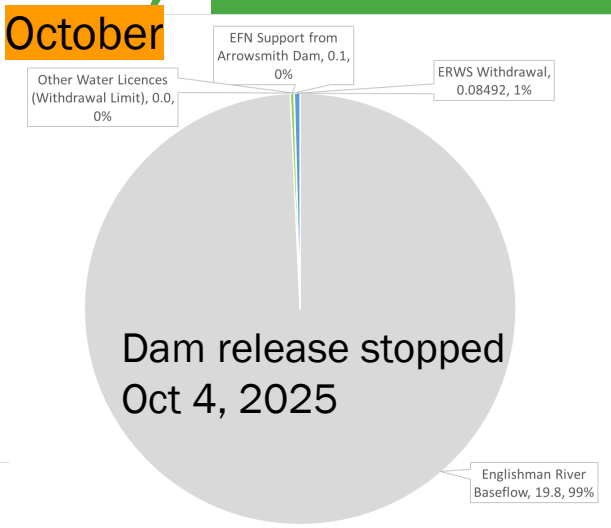
Task 4 – Definition of existing water capacity in relation to current City and ERWS needs and Environmental Flow Needs

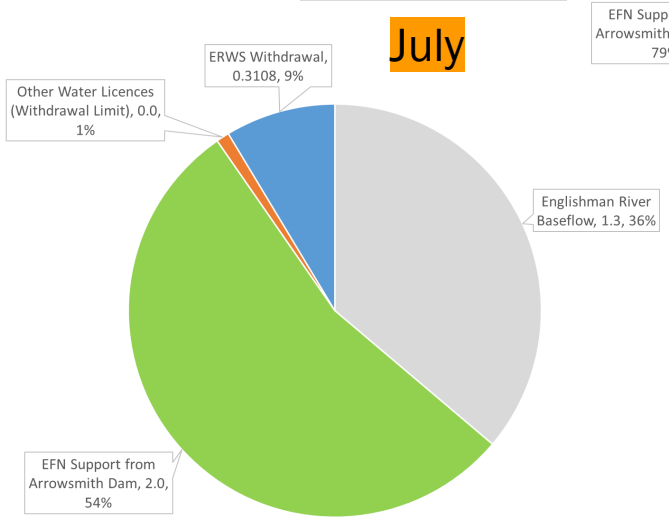


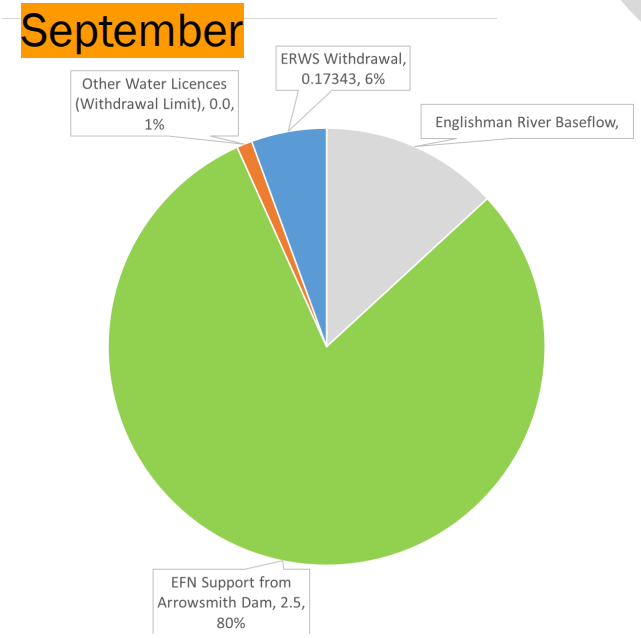
Total Volume of Surface Water in Englishman River during the Operation Season 2025 (Mm3)











Englishman River Baseflow
EFN Support from Arrowsmith Dam
Other Water Licences (Withdrawal Limit)
ERWS Withdrawal

Task 5 – Projections of climate change and effects on water supply considering population growth, reservoir condition and aquifer health

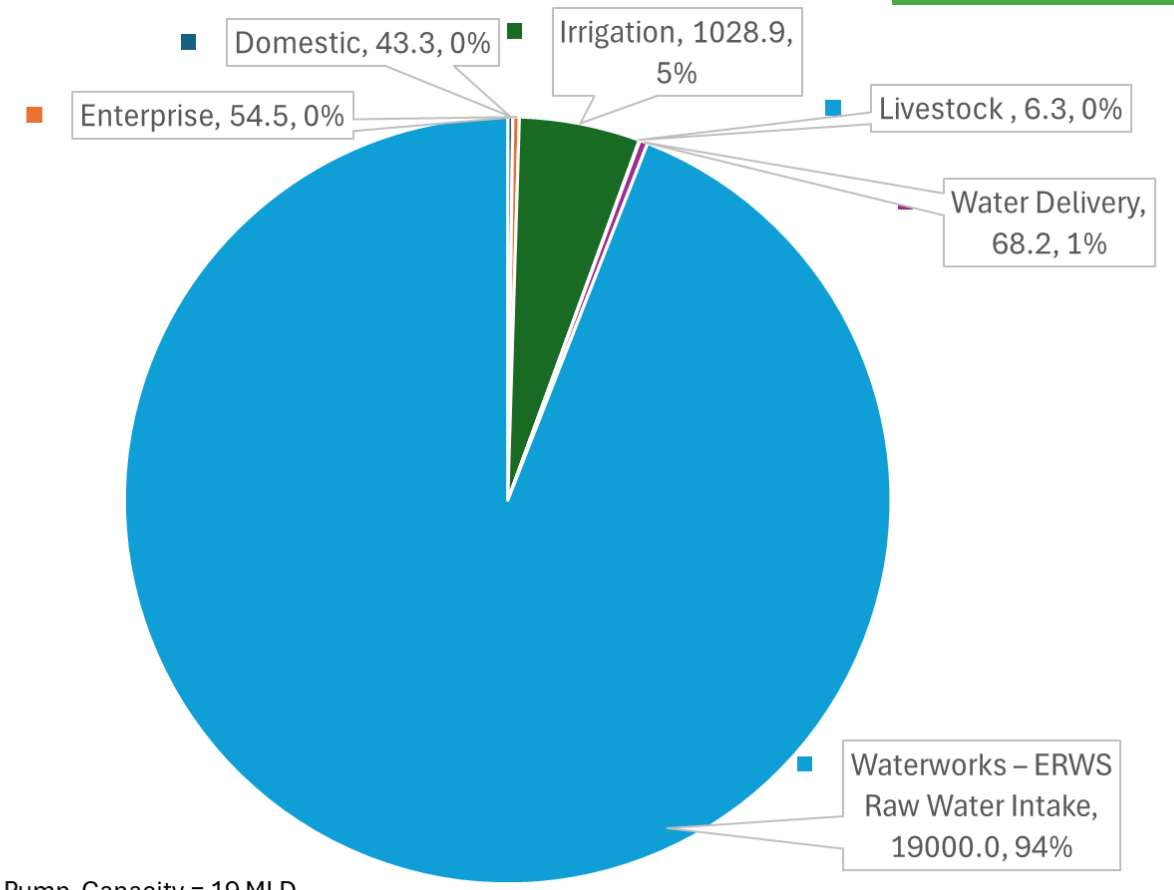
Table 7-1: Water Supply System Historical and Projected Reliability and Maximum Storage Deficit

Scenario	Baseline (1980-2010)			2020s (2010-2039)			2050s (2041-2070)			2080s (2071-2100)		
	Reliability (# out of 30 years)	Reliability (%)	Max. Annual Volume Deficit (Mm^3)	Reliability (# out of 30 years)	Reliability (%)	Max. Annual Volume Deficit (Mm^3)	Reliability (# out of 30 years)	Reliability (%)	Max. Annual Volume Deficit (Mm^3)	Reliability (# out of 30 years)	Reliability (%)	Max. Annual Volume Deficit (Mm^3)
Status Quo (Ground Water Withdrawal at Current 2025 Rate)	21	70%	1.9	18 (14 to 22)	60% (47% to 73%)	2.2 (1.2 to 5.5)	11 (2 to 15)	37% (7% to 50%)	4.0 (3.3 to 5.9)	10 (1 to 18)	33% (3% to 60%)	4.9 (1.5 to 6.4)
Status Quo (Ground Water Withdrawal at Licence Maximum)	22	73%	1.5	20 (14 to 24)	67% (47% to 80%)	2.0 (1.0 to 5.2)	13 (3 to 15)	43% (10% to 50%)	3.7 (3.0 to 5.6)	12 (2 to 19)	38% (7% to 63%)	4.7 (1.2 to 6.1)

Task 6 - Identify surface water licences that withdraw from Englishman River and may impact river base flow

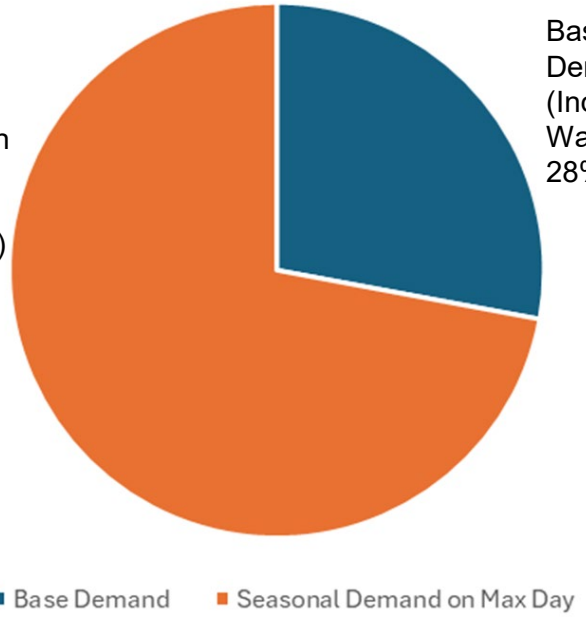
- AWS provides the majority (94%) of the licensed daily withdrawal limit
- Irrigation is the second largest (approx. 5%) licensed withdrawal limit between April 1 to Sept 30 (most of the licences on Shelley Creek)

Daily Surface Water Allowable Withdrawals (m^3/day)



Note:
ERWS Intake Pump Capacity = 19 MLD
Other uses = Average Daily Licenced withdrawal limit

Task 7 – Review water demand projections for ERWS and the City



Year	Parksville (m^3/day)						
	BD	ADD			MDD		
		Low	Best Estimate	High	Low	Best Estimate	High
2024	4,170		5,880			11,940	
2030s	4,400		6,190			14,230	
2050s	4,940	7,260	7,430	7,710	15,620	17,220	19,590
2070s	6,570	9,080	9,350	9,940	20,220	22,110	24,270

Year	Nanoose Bay Peninsula WSA (m^3/day)						
	BD	ADD			MDD		
		Low	Best Estimate	High	Low	Best Estimate	High
2024	1,190		1,970			4,580	
2030s	1,880		2,800			6,660	
2050s	2,480	3,610	3,690	3,840	7,470	8,230	9,370
2070s	2,510	3,730	3,840	4,140	8,720	9,630	10,580

Year	TOTAL (m^3/day)						
	BD	ADD			MDD		
		Low	Best Estimate	High	Low	Best Estimate	High
2024	5,360		7,850			16,520	
2030s	6,280		8,990			20,890	
2050s	7,420	10,870	11,120	11,550	23,090	25,450	28,970
2070s	9,080	12,810	13,200	14,070	28,940	31,740	34,860

Task 8 – Review current water utility operations costs and current financial management system with respect to cost recovery in context of most recent utility master plans

- COP Water annual asset renewal funding gap $2.4M (as per 2024 Infrastructure Report Card).
  Asset Management Plans to be completed for AWS & ERWS
- ERWS & AWS Asset Renewal was reviewed and to be further refined in Phase 2
- Total annual funding gap to be determined and addressed with information from this study

Task 9 - Review existing and additional water conservation efforts as they relate to deferment of required upgrades to water supply system

10-year Water Demand Management Strategy + Groundwater Optimization

- Prevent a reduction of surface water supply reliability
- Reduce reliance on ERWS for community water supply in drought cycles
- Defer need for increasing capacities of treatment and pumping facilities
- Allow time for design and construction of new source

Timing for ERWS Water Treatment Plant and Pump Station upgrades to be reviewed

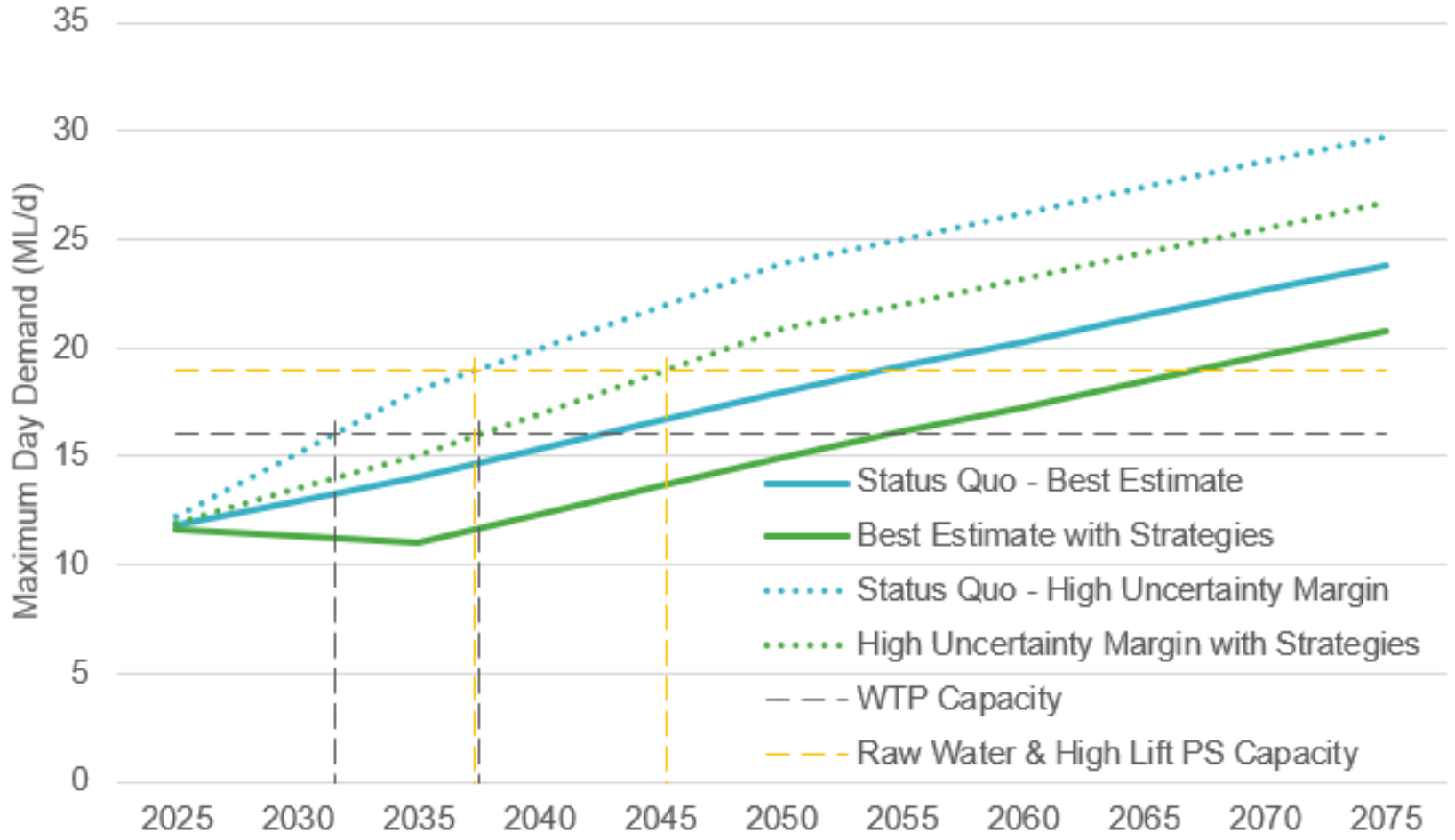


Figure 10-1: ERWS Maximum Day Demand Forecast with Capacity Upgrade Timing

Task 10 – Provide information about the study to external collaborators to educate and support transparency

- Executive summary to be public-facing document
- Prepare information pamphlets and website material
- Open house information sessions to share findings
- Parksville provides water conservation education and outreach programs, and is a participant in RDN's Drinking Water & Watershed Protection Program (DWWPP)

Task 11 - Review current regulations and existing studies/reports

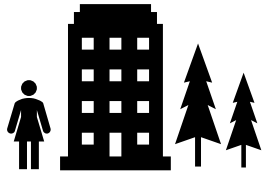
- A detailed review of prior studies and reports was completed
- Current regulations include:
  - BC Water Sustainability Act
  - Drinking Water Protection Act and Regulation
  - Provincial and Federal Fisheries Acts
  - Local Government Act and Community Charter
  - Canadian Drinking Water Guidelines
- Environmental Flow Need (EFN) flows required under the Provisional Operating Rule
- RDN's DWWPP

How Much Water Do We Use?

4-person household
100 m^2 irrigated yard

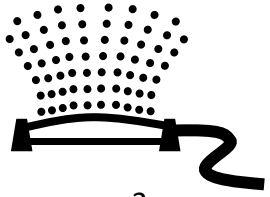
400 m^3/year

1-person apartment unit
no irrigation



90 m^3/year

Lawn sprinkler left on
overnight



10 m^3

4-person household
100 m^2 irrigated yard
Efficient fixtures and appliances

250 m^3/year

2 person household
4,000 m^2 (1 acre) irrigated yard

1,400 m^3/year

Small vacant house
0.1 L/s undetected leak

3,100 m^3/year

Summary of Recommended Actions

Groundwater

- Complete model analysis to further optimize current groundwater withdrawals (i.e. Springwood and Railway Station) and increase supply in summer months, and maintain Aquifer 216 health
- Investigate new groundwater sources (hydrogeological study & modelling)
- Continue monitoring RDN's progress on Aquifer Storage & Recovery (ASR) initiatives

Surface Water

- Conduct engineering and environmental feasibility assessment of new surface water source/storage options
- Undertake structured decision-making process for options
- Continue engagement with regulators and First Nations for refinement of EFN requirements

Next Steps

- Staff will evaluate findings from Phase 1 report and obtain Council feedback
- Staff will refine scope of work for Phase 2 (further analysis on feasibility, costs, and timelines to implement recommended actions)
- Staff will bring Phase 2 scope of work to Council & ERWS Board for review and implementation