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FERNWOOD AND HIGHLAND WATER SERVICE COMMISSION
Notice of Special Meeting on **Thursday, April 6, 2023** at **12:30 PM**
Creekside Meeting Room, 108-121 McPhillips Avenue, Salt Spring Island, BC

Gary Holman Laura Travelbea Brian Travelbea (r) Carollin Wentworth

Zoom Link:
https://us06web.zoom.us/j/85847288967?pwd=YlZJZ1pvVlRKR0s4WENROUR6U2l1QT09

AGENDA

1. **Territorial Acknowledgement / Call Meeting to Order**

2. **Election of the Chair**

3. **Approval of Agenda** 1

4. **Reports**

   4.1 Replacement of Upper Reservoir for Highland Fernwood Water System – Design Option Update & Funding Source 2-6

   That the Highland Fernwood Water Service Commission recommend the Capital Regional District proceed with detailed design for the Upper Reservoir and pursue a Twin, 45 m3, welded, carbon steel tanks with epoxy coating with a total project budget of $70,000 funded from surplus funds from completed capital projects.

   4.2 Request Additional Funds to Complete the Highland Fernwood Water Intake Project 7-9

   That the Highland Fernwood Water Service Commission recommends to the Capital Regional District Board that the Highland Fernwood 2023 Five-Year Capital Plan be amended to increase the Highland Fernwood Intake Project budget by an additional $53,000 from $147,000 to $200,000, to be funded $43,000 from Community Works Funds and $10,000 from Capital Reserves.

5. **Next Meeting – Thursday, June 8, 2023 at 12:30PM in the Creekside Meeting Room (CRD Office) #108-121 McPhillips Avenue, Salt Spring Island, BC V8K 2T6**

6. **Adjournment**

To ensure quorum, advise Shayla Burnham 250 537 4448 if you cannot attend.
EXEC-1295039085-3000

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REPORT TO HIGHLAND FERNWOOD WATER SERVICE COMMISSION
MEETING OF THURSDAY, APRIL 06, 2023

SUBJECT **REPLACEMENT OF UPPER RESERVOIR FOR HIGHLAND FERNWOOD WATER SYSTEM – DESIGN OPTION UPDATE & FUNDING SOURCE**

ISSUE SUMMARY

To update the Highland Fernwood Water Service Commission on the options for the replacement of the Upper Reservoir and to identify the funding source to complete detailed design.

BACKGROUND

The Upper Reservoir for the Highland Fernwood water system has required replacement for several years and has had to be repaired several times over this period to fix leaks. In 2020, preliminary designs were completed with various options for the reservoir(s) including; one 91 cubic meter (m3) bolted steel tank (epoxy coated), twin 45 m3 tanks (Cross Linked Polyethylene (XLPE), carbon steel or stainless steel options) and one 445 m3 bolted steel tank (epoxy coated) sized for firefighting capacity. Material of construction for the tanks included bolted steel, stainless steel and XLPE. Tank internal coatings are specified as epoxy coated or glass fused as well as additives and treatments to the coatings to extend the life of the tanks. The consultant advises that industry has somewhat moved away from using liners in water tanks due to maintenance issues. Indeed, it is the liner that has been leaking in the existing tank. Cathodic protection will be incorporated into the design where appropriate.

A capital project was initially created in 2020 to fund the conceptual and detailed design for the upper reservoir (CE.360.4655). The original design contemplated for the upper reservoir was for a single, 91 m3 reservoir and for reasons stated below, staff are now recommending twin 45 m3 tanks. This will require additional engineering and design for a new/revised foundation as well as additional interconnecting piping and valves. Additional staff time is also required to manage the project.

Staff intend to proceed with and complete the detailed design for the upper reservoir to have a construction ready project for 2024 as planned in the 2023-2027 Capital Plan. As part of detailed design, a Class B estimate for construction will be created which will inform any required changes to the Capital Plan.

ALTERNATIVES

Tank Options

Alternative 1 – Twin 45 m3 welded carbon steel tanks with epoxy coating

The twin tank configuration provides advantages for operational and maintenance issues as compared to a single tank. During a cleaning operation, crews would only be required to turn some valves to allow servicing of the “off duty” tank while the other tank continues to provide continuous water supply to the community. The capital cost of the twin 45 m3 welded carbon steel tanks ($810,000) is comparable to, although slightly less, than the single tank (91 m3)

configuration ($870,000). The tanks would be welded construction and fabricated off-site for ease and expediency of installation.

Alternative 2 – Twin 45 m3 bolted carbon steel tanks with epoxy coating

The twin tank configuration provides advantages for operational and maintenance issues as compared to a single tank. During a cleaning operation, crews would only be required to turn some valves to allow servicing of the "off duty" tank while the other tank continues to provide continuous water supply to the community. The capital cost of the twin 45 m3 bolted carbon steel tanks ($1,300,000) in this size is quite high. Bolted tanks are not commonly used for tanks of this size unless there are significant access constraints for a site that preclude lifting a shop fabricated, welded tank in to place.

Alternative 3 – Twin 45 m3 welded carbon steel tanks with glass fused coating

Glass fused internal coating is not available for a welded tank.

Alternative 4 – Twin 45 m3 bolted carbon steel tanks with glass fused coating

Same as for Alternative 2 but with a glass fused internal coating instead of epoxy. The glass fused option would be marginally more expensive ($5,000) than the epoxy option.

Alternative 5 – Single 91 m3 bolted, carbon steel tank with epoxy coating

This alternative would fit roughly in the same footprint and the same location as the existing tank. The single tank configuration creates some operational and maintenance issues as compared to twin tanks. With a single tank, any cleaning operation would require the rental of a temporary tank to maintain water service whereas a twin tank configuration would only require turning some valves to allow servicing of the "off duty" tank while the other tank continues to provide continuous water supply to the community. The capital cost of the single 91 m3 tank ($870,000) is comparable to the twin tank configuration. It is bolted construction so would necessarily be assembled on site.

Alternative 6 – Single 445 m3 bolted steel tank with epoxy coating

The estimated capital cost of this alternative is $1,300,000. The limited footprint available for construction at the site will make installation of this size of tank very challenging. The existing pump house would need to be demolished, relocated, and rebuilt. There would be no further reductions in fire insurance premiums for the residents of Highland / Fernwood as Salt Spring Island Fire Rescue has attained accreditation through the Fire Underwriters Survey (FUS) for their Superior Tender Shuttle Service and this provides for the same premium reductions as if the area was serviced by hydrants supplied from an adequately sized reservoir. Further, although the distribution network is scheduled for replacement starting in 2024, many of the lines feeding the existing hydrants are currently undersized for firefighting capacity.

Alternative 7 – Twin 45 m3 stainless steel tanks

Although stainless steel tanks result in an attractive equivalent annual capital cost, there is limited experience with this material in domestic water systems and there are potential corrosion issues from the chlorides from the sodium hypochlorite which is added to the system for disinfection. Stainless steel was not considered due to the additional care required for the management of chlorides.

Alternative 8 – Twin 45 m3 cross linked polyethylene (XLPE) tanks

Although the XLPE tanks are attractive from a cost perspective and additives can be blended in to the polymer during manufacturing to reduce the effects of UV exposure, this option still has the shortest estimated life, approximately twenty (20) years, and was not considered because of this shorter life expectancy.

Alternative 9 – Request more information from CRD staff

The Commission can receive this report but request further information from CRD staff.

The table below summarizes the options being considered. The costs are from the consultants Class C estimate (+/- 25% to 40%). Note that a discount rate of 4% was used to calculate the equivalent annual capital cost.

Option	Cost	Life Exp.	Equivalent Annual Capital Cost
2 – 45 m3 Carbon Steel Welded, Epoxy	$810,000	30 Years	$46,841
2 – 45 m3 Carbon Steel Bolted, Epoxy	$1,300,000	30 Years	$74,595
2 – 45 m3 Carbon Steel Bolted, Glass Lined	$1,320,000	30 Years	$76,334
1 – 91 m3 Carbon Steel Bolted, Epoxy	$870,000	30 Years	$50,311
1 – 445 m3 Carbon Steel Bolted, Epoxy	$1,300,000	30 Years	$74,595

Budget and Funding

Funding for this work is available from surplus funds from completed legacy projects associated with the Highland Middle Reservoir Repair (CE.360.4651) and Upper Reservoir Repair (CE.360.4655), both from the Highland Water Service (2.620) which was merged with the Highland Fernwood Service (2.621) several years ago. Consolidating remaining funds, as well as any accrued interest, provides a total of approximately $80,000 which is sufficient to complete the detailed design for the Upper Reservoir project.

IMPLICATIONS

Tank Options

Alternative 1 – Twin 45 m3 welded carbon steel tanks with epoxy coating

This alternative is the most attractive from an operational and constructability perspective.

Alternative 2 – Twin 45 m3 bolted carbon steel tanks with epoxy coating

This alternative is cost prohibitive.

Alternative 3 – Twin 45 m3 welded carbon steel tanks with glass fused coating

Glass fused internal coating is not available for a welded tank.

Alternative 4 – Twin 45 m3 bolted carbon steel tanks with glass fused coating

This alternative is cost prohibitive.

Alternative 5 – Single 91 m3 bolted, carbon steel tank with epoxy coating

This alternative is not attractive from an operational suitability perspective so is not a preferred option.

Alternative 6 – Single 445 m3 bolted steel tank with epoxy coating

This alternative is cost prohibitive.

Alternative 7 – Twin 45 m3 stainless steel tanks

This alternative is not attractive from an operational suitability or experience perspective so is not a preferred option.

Alternative 8 – Twin 45 m3 cross linked polyethylene (XLPE) tanks

This alternative is not attractive from a service life expectancy perspective so is not a preferred option.

Alternative 9 – Request more information from CRD staff

Request further information from CRD staff.

Budget and Funding

The table below quantifies the costs to complete and the funds which are available.

Additional Requirements Cost to Complete Detailed Design	**$ Amount**
Detailed Design and Class B Cost Estimate	$51,418
Site Survey	$3,600
Contingency (10% on above)	$5,500
CRD Project Management	$9,482
Total Additional Requirements/Cost to Complete	**$70,000**
Funds Available	**$80,000**

CONCLUSION

Tank Options

Twin, 45 m3, welded, carbon steel tanks with epoxy internal coating provide the best solution from an operational, constructability, industry experience and life cycle cost perspective.

Budget and Funding

There are sufficient funds available to complete the detailed design work required for the project.

RECOMMENDATION

That the Highland Fernwood Water Service Commission recommend the Capital Regional District proceed with detailed design for the Upper Reservoir and pursue a Twin, 45 m3, welded, carbon steel tanks with epoxy coating with a total project budget of $70,000 funded from surplus funds from completed capital projects.

Submitted by:	Dean Olafson, P. Eng., MBA, Engineering Manager, Salt Spring Island
Concurrence:	Karla Campbell, MBA, BPA, Senior Manager, Salt Spring Electoral Area
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer

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REPORT TO HIGHLAND FERNWOOD WATER SERVICE COMMISSION
MEETING OF THURSDAY, APRIL 6, 2023

SUBJECT **Request Additional Funds to Complete the Highland Fernwood Water Intake Project**

ISSUE

To seek additional funds to complete the construction of the Highland Fernwood Water Intake Project.

BACKGROUND

The Highland Fernwood Intake Screen project was first initiated in 2019 to address the following issues.

- To improve intake system performance to prevent fouling and potential fish impingement.
- To improve system capacity to meet peak flow demand.
- To improve access and preclude the need to shut down the raw water pumps during maintenance and repair.

The detailed design for the "onshore" and "offshore" portion are essentially complete. The only work remaining is to gain regulatory approval for the work and the construction of the intake and associated onshore piping. Initial cost estimate for the work was provided by the design consultant in 2020. Following subsequent updated cost estimates in late 2022 it was found that the estimated cost for construction has increased.

ALTERNATIVES

Alternative 1

That the Highland Fernwood Water Service Commission recommends to the Capital Regional District Board that the Highland Fernwood 2023 Five-Year Capital Plan be amended to increase the Highland Fernwood Intake Project budget by an additional $53,000 from $147,000 to $200,000, to be funded $43,000 from Community Works Funds and $10,000 from Capital Reserves.

Alternative 2

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

IMPLICATIONS

If additional funding is not secured, based on the current cost estimates, there will not be sufficient funds to complete construction of the intake in 2023. Construction might not then occur until 2024. Note that this funding request has the express support of Salt Spring Island Electoral Area Director, Gary Holman. The table below quantifies the costs to date, costs to complete and the balance needed to be funded.

	CWF	CRF	Total
Current Project Budget			
Construction	100,000	-	
Design	-	41,250	
Project Management	-	5,750	
Total Project Budget	100,000	47,000	147,000
Costs to Date			
Construction	-	-	
Design	-	27,975	
Project Management	-	12,525	
Total Costs to Date	-	40,500	40,500
Cash on Hand	**100,000**	**6,500**	**106,500**
Estimated Cost to Complete			
Construction (Class A Cost Estimate)	107,280		
Contingency (15%)	16,100		
Construction Consultant Services	19,620		
Third Party Environmental Services		2,000	
Project Management		14,500	
Total Cost to Complete	**143,000**	**16,500**	**159,500**
Additional Funding Required	**43,000**	**10,000**	**53,000**
Original Project Budget			147,000
Additional Funding Required			53,000
Revised Project Budget			**200,000**

The Capital Reserve Fund balance is estimated to be $41, 340 by 2023 year-end after funding the additional $10,000 for this project. It is recommended that reserve fund contributions be increased in future years in aiming to achieve the optimal reserve fund level to ensure long-term prudent and sustainable management of the service delivery.

CONCLUSION

There are currently insufficient funds to complete the construction of the Beddis Intake project. The new intake and associated piping are required to ensure continued efficient operation of the water treatment facility. The project was initiated in 2019 and costs have increased since that time resulting in this request for additional funding. With this additional funding in place and the designs now complete, the project will be ready to execute construction within the environmental window for the protection of marine life.

RECOMMENDATION

That the Highland Fernwood Water Service Commission recommends to the Capital Regional District Board that the Highland Fernwood 2023 Five-Year Capital Plan be amended to increase the Highland Fernwood Intake Project budget by an additional $53,000 from $147,000 to $200,000, to be funded $43,000 from Community Works Funds and $10,000 from Capital Reserves.

Submitted by:	Dean Olafson, P. Eng., MBA, Engineering Manager, Salt Spring Electoral Area
Concurrence:	Karla Campbell, BPA, MBA, Senior Manager, Salt Spring Electoral Area
Concurrence:	Lia Xu, M. Sc., CPA, CGA, Manager, Manager Financial Services
Concurrence:	Ted Robbins, B. Sc., C. Tech., Chief Administrative Officer