

SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

TO: Committee of the Whole – December 12, 2024

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SUBJECT: **COST RISK ASSESSMENT AND VALUE ENGINEERING REPORT (CRAVE):
LANGDALE WELL FIELD WELL DEVELOPMENT – PHASE 3, ROUND 2**

RECOMMENDATION(S)

- 1) **THAT the report titled Cost Risk Assessment and Value Engineering Report (CRAVE) Analysis Report: Langdale Well Field Well Development – Phase 3, Round 2 be received for information;**
 - 2) **AND THAT a 2025 budget proposal be presented at the 2025 Round 2 budget meetings for the construction phase of the Langdale Well Field project with the option of blending with a watermain alignment along North/Chamberlin Road.**
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BACKGROUND

The Sunshine Coast Regional District (SCRD) has experienced critical water shortages during recent summers, exacerbated by climate change. Since 2017 the SCRD has undertaken several projects to explore the development of new groundwater sources. This resulted in the completion of the development of the Church Road Well Field in 2023. In 2020 several test wells were drilled to confirm the potential for the development of more well fields. The site next to the current Langdale well was confirmed as the most feasible location for the development of a new field. This well field would consist of two new primary sized production wells drilled near Langdale Ferry Terminal, yielding 13.3 L/s (Well 1) and 56.8 L/s (Well 2), with a third well planned as a mechanical backup.

At the January 25, 2024, Regular Board meeting, the results of the preliminary design were presented, including an associated costs estimate of \$22.75 million. The following resolution was passed.

019/24 Recommendation No. 4 *Results Groundwater Investigation Phase 3 – Round 2 – Langdale Wellfield Development*

THAT the report titled Results Groundwater Investigation Phase 3 - Round 2 – Langdale Wellfield Development be received for information;

AND THAT the SCRD proceed with the final design and engineering to support construction of the Langdale Wellfield.

As part of the 2024 budget process, the Board decided to not support the inclusion of the construction phase of the project in the 2024-2028 Financial Plan.

The purpose of this report is to provide the results of a study undertaken to further optimize the design for this well field in advance of 2025 Round 2 deliberations.

DISCUSSION

The preliminary design as presented to the Board in early January 2024 included the construction of a new treatment plant at the top of the Langdale Bypass to meet Canadian Drinking Water Quality standards for iron and manganese. This design would result in costs for the completion of this well field of \$22.75 million. The costs for the treatment plant was one of the major cost drivers for this design.

In response to the Board's January 2024 decision to delay the construction phase of the project, staff initiated a Cost Risk Assessment and Value Engineering (CRAVE) analysis of several alternatives to evaluate the cost/benefit design alternatives for the well production capacity, pump design, transmission main alignment, and associated water treatment requirements.

The study was conducted in October and November 2024. The primary objectives of the CRAVE study were to:

- Verify or improve upon the various concepts for the project.
- Identify high risk areas in delivering the project.
- Improve the value of the project alternatives through innovative measures aimed at improving performance while reducing costs of the project.
- Perform a cost risk assessment on both the baseline design and the Value Engineering (VE) recommendations.

Options Analysis

The CRAVE study evaluated several alignment options based on performance criterion such as long and short term operation and maintenance costs, lifecycle cost, environmental and archaeological impact, system compatibility, and overall construction costs.

Attachment A shows images of aerial overviews of the assessed options. A more detailed description of the options considered can be found in the consultant's report included in Attachment B.

The complete evaluation process and results are contained in Attachment B.

Based on this analysis, staff are presenting two options for the Boards consideration. Both options do not include the construction of a water treatment plant and rely on the dilution, blending, of the water from the Langdale Wellfield with water from the Church Rd Wellfield to meet the Canadian Drinking Water Quality standards.

If Church Rd Well Field is offline and the Langdale Well Field is required to be put online, sufficient blending of the Langdale water with that of other sources at the Reed Road pump station is required to ensure that the Canadian Drinking Water Quality aesthetic standards for iron and manganese can be achieved at all times. If that is not the case, users could experience the development of a removable brownish ring in their toilet bowls and a public notice would need to be issued. This notice would advise the public of the potential aesthetic issues and the nature of the change.

If at some point it is desired to treat the water to reduce the dependency of the blending with water from the Church Road Well Field, or the production capacity of the Langdale Wellfield is increased, such treatment could be added. This could happen at the site originally considered for a water treatment plant at Stewart Road or at the Reed Road pumpstation. Both options presented below include upgrades to the Roberts Creek pump station to maximize the distribution of the water towards the Sechelt area.

Option 1: Blending and North Rd/Chamberlin Road watermain alignment (recommended option)

As the costs associated with the development of the well field itself are the same in most of the scenarios, the main driver for costs is the alignment of new watermains. Due to overlap of this option with future planned work on watermains, this option presents an easier connection into existing systems and opportunities for overall potential cost savings for the SCR. Operationally this option also has a lower complexity and permitting risks compared to some of the other options.

Option 2: Blending and Langdale Bypass watermain alignment

Compared to Option 1 this option requires larger pumps at the well field to pump the water up the Langdale Bypass. The alignment along the Langdale Bypass corridor could also result in greater permitting complexity and increased impact to the community. Discussions with the Ministry of Transportation Infrastructure to confirm their requirements for constructing a water main along the Langdale Bypass are ongoing and could increase the overall project costs.

Permitting and First Nation engagement

Staff have already engaged with the shíshálh Nation and Skwxwú7mesh Nation. Feedback has been positive with the only remaining concern being the waste stream produced by treatment if the SCRd was to proceed with that option.

The Skwxwú7mesh Nation has graciously provided an approved translation of the project name and staff are recommending that the project be renamed to differentiate it from the existing Langdale well for both heritage and clarity reasons. The approved translation is “Ch’kw’elhp Well Field” and if the project was to proceed, “Ch’kw’elhp Water Treatment Plant”.

For both of the presented options, the following approvals and permits are required:

- Groundwater License (in progress).
- Approval from Skwxwú7mesh Nation (in progress).
- Environmental Assessment Office Notification (complete).
- Ministry of Transportation and Infrastructure Approval (in progress).
- Construction and Operational Permits from Vancouver Coastal Health.
- Land Use and Property Agreements with BC Ferries (in progress).

Land agreements with BC Ferries are identified as the highest risk factor due to the need for easements and a property transfer near the Langdale Terminal which is a very complex process.

The Crown Land Tenure Application that has been submitted for the originally considered water treatment site at Stewart Road. It is suggested this process be continued to allow for the potential of a reservoir facility to be constructed, or a future treatment plant if it is deemed necessary for either Langdale well field or other future sources.

FINANCIAL IMPLICATIONS

The recommended option (Option 1) has an estimated cost of \$17.1 million. This would allow for the design, engineering, property acquisition, administration, and construction of a new well pump station and building, reservoir works, and raw and potable water mains. A 30% contingency allowance is included in these estimates.

The costs of Option 2 is currently estimated at \$18.7 million and could increase based on construction and paving requirements for the watermain installation along the Langdale Bypass.

Pending Board support for the recommended option, staff will update the Langdale Well Field Budget Proposal for consideration during the January Round 2, 2025 budget process, including funding options.

Additional staffing and resources will be required to operate and maintain the new infrastructure. If the Board includes this project in the 2025 budget, staff will advance the detailed design, operational requirements, and update capital and operational cost estimates.

TIMELINE FOR NEXT STEPS

Based on the direction received from the Board, staff will update the Round 2 Budget proposal for the construction phase of this project, including funding options. Staff will also present a report with the financial and legal implications associated with these funding options, including a possible electoral assent process to secure a long-term loan.

Pending the approval of this budget proposal, staff will start preparing the tender documents for the final design, permitting, and construction management.

The actual construction of the Langdale Well Field is anticipated to start in the second half of 2026 at the earliest and the commissioning is expected to be completed in 2028.

Staff are preparing a report to be presented at the 2025 Round 2 budget deliberations that will provide a status update on all current water supply and water efficiency projects including a comparison of benefits, timelines and costs.

COMMUNICATIONS STRATEGY

Information will be shared via local media, corporate newsletters, social media, and the SCRD website. More information will be provided to property owners near the proposed well fields, and the proposed watermains and infrastructure. Regular updates will be posted to the projects Let's Talk page for community to view.

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.

CONCLUSION

In January 2024 the Board was presented with an initial design for this well field. As the first step of the details design phase for this project, staff initiated a Cost Risk Assessment and Value Engineering (CRAVE) analysis of several alternatives to evaluate the cost/benefit for the well production capacity, pump design, transmission main alignment, and associated water treatment requirements. Besides the original concept, several other options to address the water quality and water main alignments were considered in this analysis.

A series of ten performance characteristics was developed, weighted, and rated against the five alternative options, resulting in the best alternative option being identified as the blending of the water at the Read Rd pumpstation with a watermain alignment along North/Chamberlin Road (Option BA-3).

This option delivers the best value by balancing cost, risks, performance, and long-term goals. Staff recommend proceeding with design, permitting, and a report on the legal and financial implications and funding options.

Attachment A - Aerial overviews of the assessed options

Attachment B - Report OnSite Engineering Ltd. Cost Risk Assessment and Value Engineering Langdale Well Field

Reviewed by:			
Manager		Finance	X- A. Taylor
GM		Legislative	
CAO/CFO	X-T. Perreault	Risk Management	X- V. Cropp

ATTACHMENT A

Aerial overviews of the assessed options

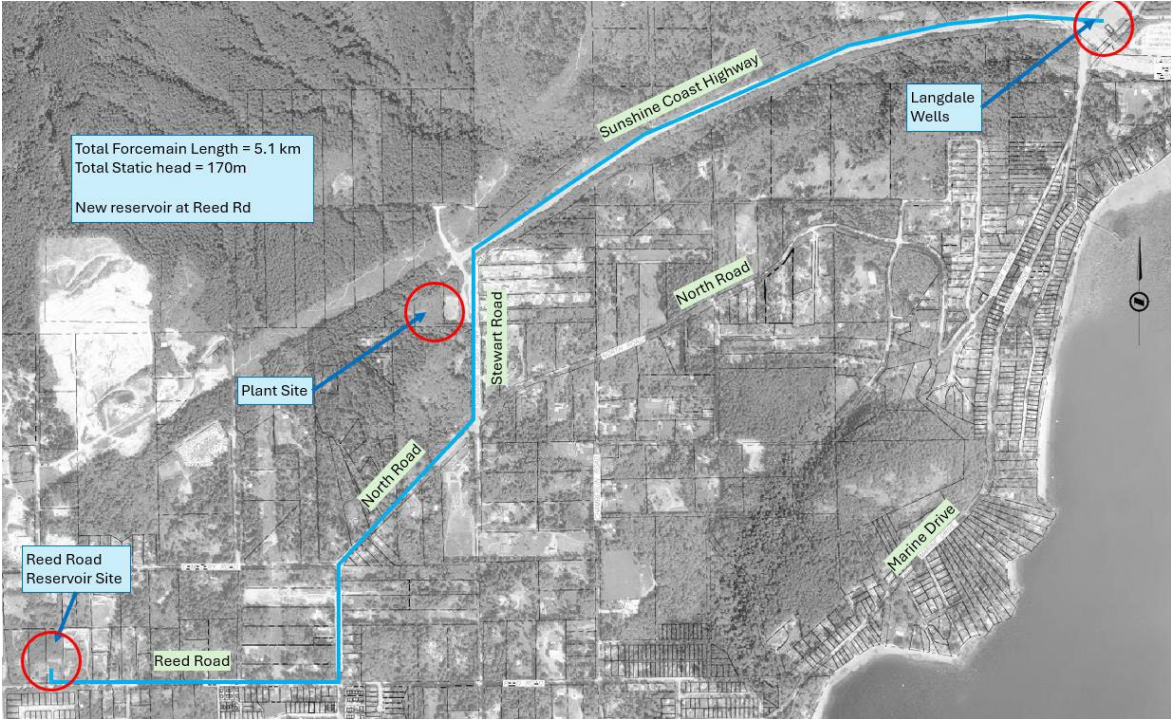


Figure 1- Alternative 1 – BA-1 Langdale to Reed Reservoir via Langdale Bypass

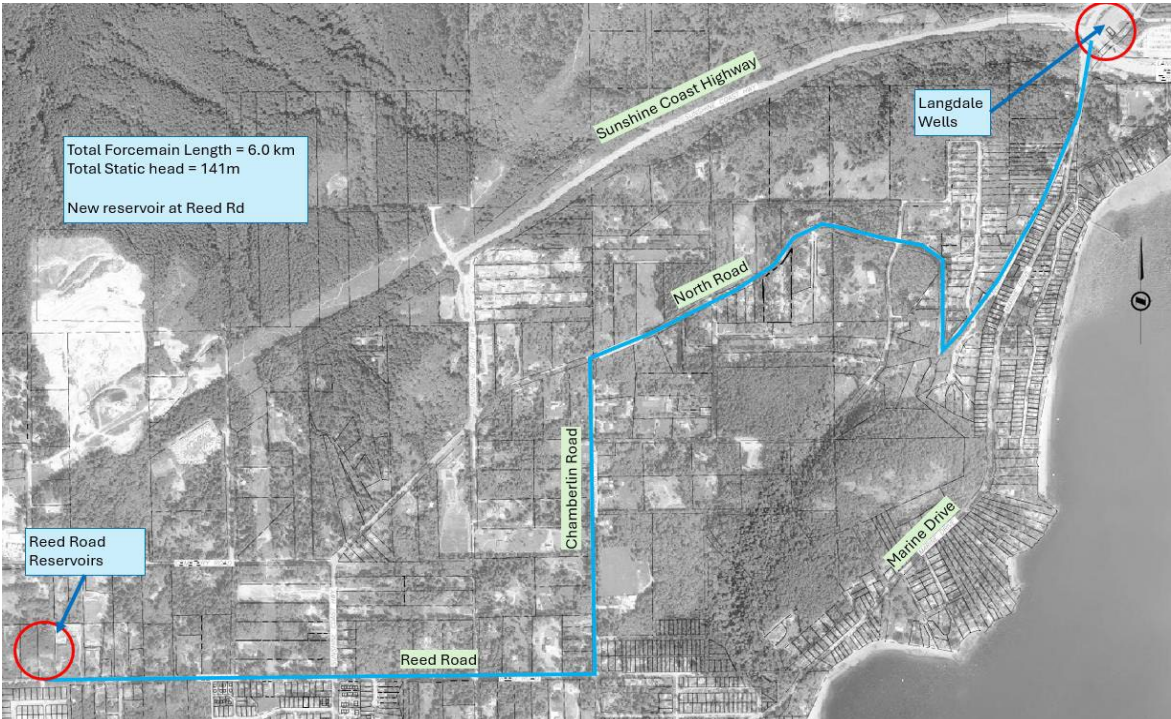


Figure 2 - Alternative 2 – BA-3 Langdale to Reed Reservoir via North/Chamberlin/Reed Rd

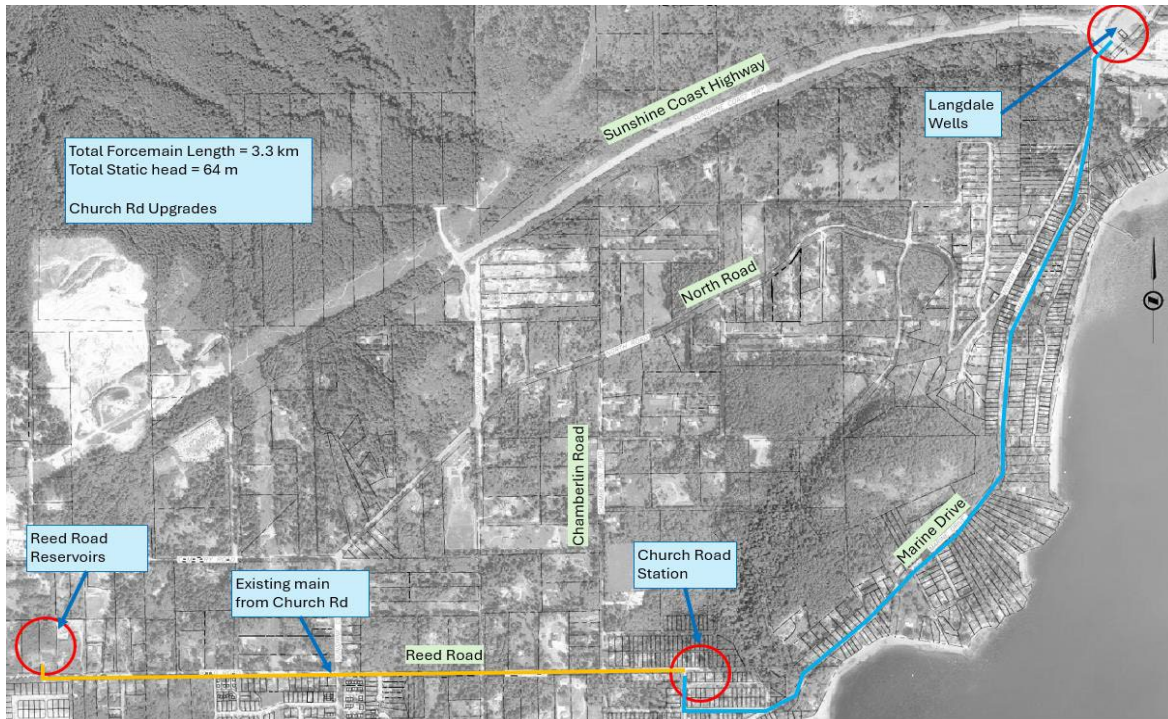


Figure 3 - Alternative 3 – BA-6 Langdale to Church Rd via Marine Dr

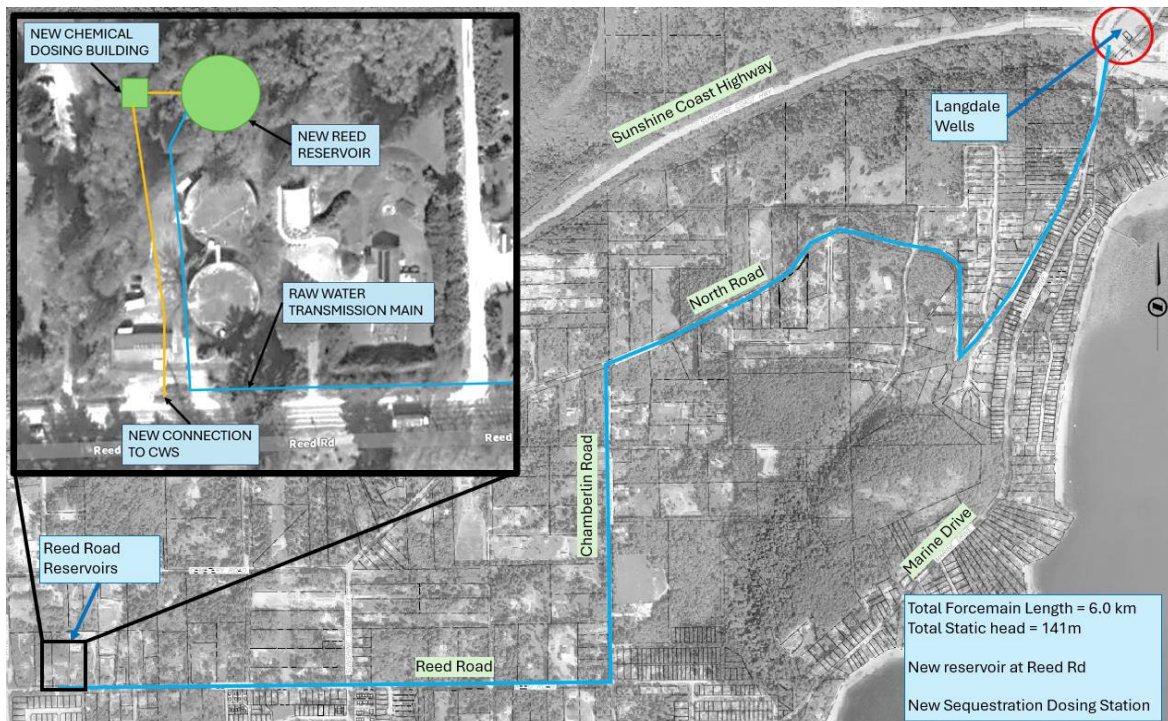


Figure 4 - Alternative 4 – S-1 Langdale to Reed Road via North and Chamberlin Roads

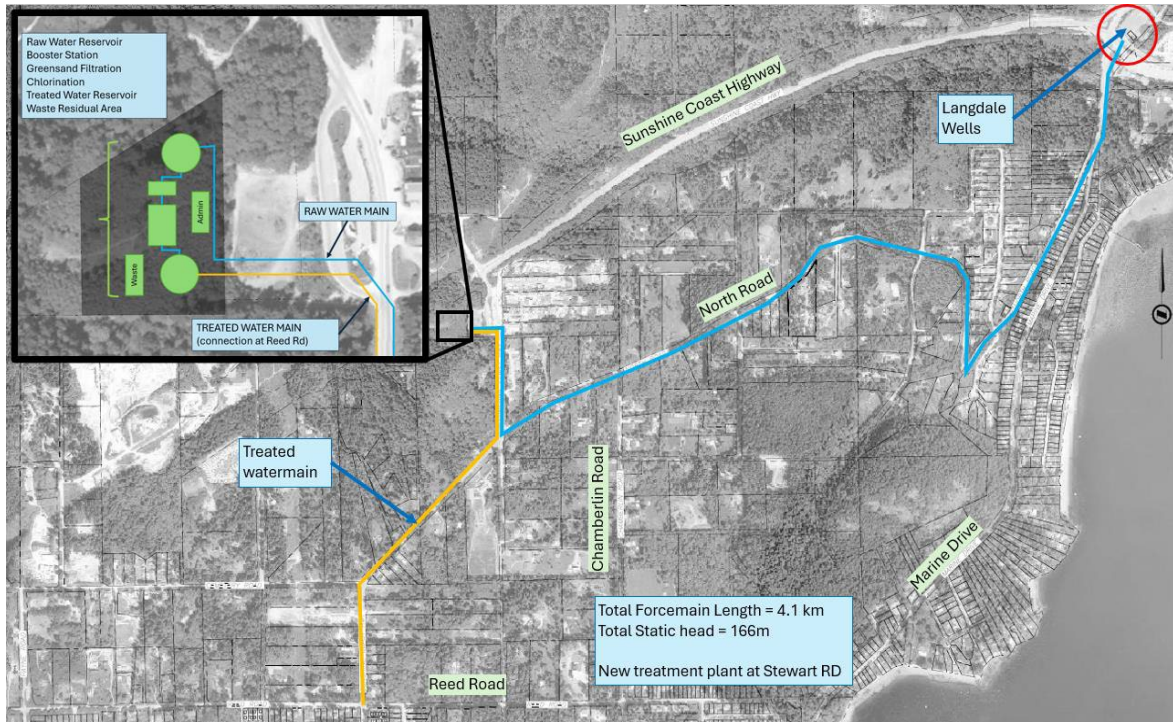


Figure 5 - Alternative 5 - T-2 Langdale to Stewart Rd Plant via North Rd