

DATE OF MEETING FEBRUARY 16, 2022

AUTHORED BY MIKE SQUIRE, MANAGER, WATER RESOURCES

SUBJECT ROCK CITY ROAD WATER SUPPLY PIPELINE RISK REDUCTION

OVERVIEW

Purpose of Report

To provide Council an opportunity to reduce the seismic risk to the water supply line along Rock City Road.

Recommendation

That the Finance and Audit Committee recommend that Council direct Staff to install joint restraints on the Rock City Road water supply line and add a project to 2022 for \$350,000 funded from the Water Reserve to complete the work.

BACKGROUND

The water supply to the north end of the City of Nanaimo (City) is supplied through a large pipeline that travels along Rock City Road and then to Lost Lake Reservoir. The pipeline provides a critical supply link, and there is currently no redundant system that can efficiently operate as a backup during summer peak water demands.

There is currently an active private development at 3500 Rock City Road. The development is required, as part of their private work, to construct utilities and road works along Rock City Road. During the installation of the infrastructure along Rock City Road, the City has become aware of an existing weak section of ground just north of Ocean Pearle Terrace, adjacent to a wetland. The developer's geotechnical engineer completed an analysis that highlights both ground settlement and seismic risks.

The seismic review of the road stability containing the water supply pipeline, showed it is at risk of failure during a modest earthquake. The pipeline was constructed in 1995 with traditional bell/hub joints that could come apart if the soil around the pipeline moves, as is predicted.

There are long term plans to construct an additional water supply pipeline to the north end, along Rutherford Road. That new pipe line is currently scheduled for construction in 2026/2027. Once the new pipeline is operational, it would provide important redundancy for the supply line along Rock City Road.

DISCUSSION

The level of risk to the pipeline along Rock City Road is greater than would be expected of an asset of that importance. Although there is an active development, they are not required to mitigate this broader existing risk. To mitigate the risk, it is proposed to install joint restraints along the existing pipeline through the section with the poor soil conditions. Adding those restraints would help the pipeline avoid coming apart during a moderate seismic event. The best opportunity to install the joint restraints, is in the next several months prior to the proposed adjacent development completing all road works along Rock City Road.

Although a new redundant pipeline is planned to be added in the future that would lessen the risk, the pipeline along Rock City Road is expected to remain in service for many years, and the risk reduction benefit would still be important. The location of the proposed improvement is shown on Appendix A. |

FINANCIAL CONSIDERATIONS

The cost of risk mitigation is anticipated to be between \$200,000 and \$350,000 based on initial cost estimates. The projected balance in the Water Reserve is sufficient to fund the required work.

OPTIONS

1. That the Finance and Audit Committee recommend that Council direct Staff to install joint restraints on the Rock City Road water supply line and add a project to 2022 for \$350,000 funded from the Water Reserve to complete the work.
 - Adding the joint restraints will lessen the risk to the critical water supply pipeline during a seismic event.
 - Adding joint restraints after a pipeline is already installed is challenging and will require careful excavation. There isn't a disadvantage in adding the joint restraints, as it is more of a risk reduction initiative that requires resources.
 - The cost of the risk mitigation is expected to be between \$200,000 and \$350,000 that would be taken from the Water Reserve, leaving less funding available for other needs.
 - Financial Implications: The 2022 – 2026 Financial Plan will be amended for final to include the project.
2. That Council provide alternative direction. |

SUMMARY POINTS

- There is a section of Rock City Road north of Ocean Pearle that is seismically vulnerable.
- The water supply line along Rock City Road could be seriously damaged during a seismic event.
- To mitigate the risk to the water supply line, joint restraints can be retrofitted.

Appendix A – Rock City Rd Site Area

Submitted by:

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Concurrence by:

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Bill Sims
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Director, Finance |