STAFF REPORT TO COMMITTEE

DATE OF REPORT	February 9, 2022
MEETING TYPE & DATE	Committee of the Whole of March 23, 2022
FROM:	Environmental Services Division Engineering Services Department
SUBJECT:	Saltair Coastal Slope Stability Assessment
FILE:	5280-30

PURPOSE/INTRODUCTION

The purpose of this report is to present the results of the Saltair Coastal Slope Stability Assessment and approaches to development within hazardous areas.

RECOMMENDED RESOLUTION

That it be recommended to the Board:

1. That the Coastal Slope Stability Assessment prepared by Stantec Consulting Ltd. in association with Palmer in February 2022, be received.
2. That staff report back to the Electoral Area Services Committee on the process for updating the OCP for the Electoral Areas to incorporate the mapping and recommendations of the Saltair Coastal Slope Stability Assessment.
3. That the Coastal Slope Stability Assessment be referred to the Emergency Management Division to inform the regional disaster risk reduction program and emergency preparedness.
4. That staff prepare a report outlining potential additional work and cost estimates for the 2023 budget year including:
    a) Expansion of the coastal slope stability assessment to other areas in the region with similar geomorphic characteristics, including portions of North Cowichan, Cowichan Bay and Mill Bay in order to identify risks to communities and infrastructure.
    b) More detailed subsurface geotechnical investigation of the Saltair study area to better refine the recommended setback area.
    c) A review of stormwater discharges within the Saltair study area and development of a stormwater management plan.
5. That the Coastal Slope Stability Assessment prepared by Stantec Consulting Ltd. In association with Palmer in February 2022 be referred to the Town of Ladysmith and the Municipality of North Cowichan.

BACKGROUND

The Environmental Services Division has been leading a number of natural hazard risk assessments as part of the Climate Adaptation Program and to inform the statements and map designations in Official Community Plans respecting lands that are subject to hazardous conditions. In Saltair, the stability of steep slopes along the coastline and up coastal ravines has long been a concern, small landslides are common and can be the result many factors including heavy rainfall, poor drainage, or alterations to the slope. Site-specific geotechnical evaluations have been carried out for a number of properties but there had been no area-wide analysis prior to the current project.

Climate change projections for the region identify increasing annual winter precipitation and more frequent intense storm events. The intense rainfall from these storms increases the likelihood of landslides on unstable slopes within the region. In addition, sea level rise is projected to increase the effect of coastal back cutting and instability further compounding the risk in coastal areas.

To support needed technical documentation and specifically to inform the Landslide Hazard Development Permit Area (DPA) designation and guidelines for the Saltair area, the Community Planning Division provided funding necessary for this case study. Stantec Consulting Ltd. in association with Palmer conducted a slope stability assessment of the entire Saltair portion of the coast of Vancouver Island. Upon review of the preliminary results, this analysis was extended up the Stocking Creek and Porter Creek ravines to ensure consideration of the full extent of the hazard within Saltair.

ANALYSIS

The Stantec / Palmer analysis involved the use of LiDAR, historic aerial photographs and field investigations to identify landslides along the steep coastal and ravine bluffs in Saltair. While many small, surficial landslides were noted, investigators also discovered evidence of larger, retrogressive landslides extending much further inland from the steep banks. Most of these landslides are believed to predate the establishment of the community of Saltair and likely come as a surprise to most residents whose experience is limited to the more frequent, smaller slope failures.

Twenty-four historic retrogressive landslide features were identified and analyzed to determine the extent to which they extended inland from the crest of the slope. The angle from the crest to the toe of the deposit was used to identify a setback area within which there is the potential for a retrogressive landslide to occur. In recognition of the projected impacts of climate change, a 1m increase in sea level rise was used to determine the future location of the toe of the slope. Stantec / Palmer recommend a further setback of 15m for the establishment of a development permit area. Within this area, developments would require a geotechnical assessment to identify and mitigate site-level hazards.

The extent of the recommended setbacks is substantial, encompassing entire properties adjacent to the coastline and ravine banks. In some cases, the hazard extends to properties which are adjacent to or even across the street from waterfront / ravine-front properties.

The scope of the current analysis did not include subsurface investigation which could identify the presence of bedrock or other geological features which would affect the likelihood of failure for a particular slope. Recommendations include:

- Site level geotechnical assessments for development within the identified setback area
- More detailed investigation (e.g. subsurface) to a) differentiate the factors determining the hazard zones to support refinements to establish smaller, more precise hazard zones; and b) to better determine the age of historic landslides and thus refine the likelihood of occurrence
- Expansion of study area both north and south into Town of Ladysmith and North Cowichan (Chemainus) following the extent of the coastal bluffs as well as expansion to other parts of the region where similar ‘flat over steep’ terrain exists (e.g. Cowichan Bay, Mill Bay, parts of North Cowichan)

Additional recommendations relate to management of drainage and stormwater in the areas adjacent to the potentially unstable slopes as well as maintenance of native vegetation on slopes. A review of stormwater discharges within the study area is recommended followed by the development of a stormwater management plan.

The Saltair Coastal Slope Stability Assessment is available here:

https://cvrd.ca/DocumentCenter/View/103122/Saltair-Coastal-Slope-Stability-Assessment

FINANCIAL CONSIDERATIONS

Cost implications depend on the extent of future investigation. Ballpark cost estimates have been requested for some of the Stantec / Palmer recommendations. Costs for geotechnical reports to support development would be the responsibility of proponents.

COMMUNICATION CONSIDERATIONS

The Saltair Coastal Slope Stability Assessment has been shared with staff from adjacent municipalities as the coastal bluffs (and presumably the associated hazards) extend both north and south of Saltair. Communication with residents who reside within or adjacent to the setback areas will be important to help residents understand the implications of the Palmer / Stantec findings. Letters will be sent to affected owners and a public meeting will be held to inform Saltair residents about the Slope Stability Assessment and to explain potential implications and next steps. In addition, the Bang the Table platform will be used to communicate information.

Additional briefings have taken place with CVRD utilities and asset management staff who have infrastructure which may impact or may be impacted by potential instability in the area.

The report has been shared with the Ministry of Transportation and Infrastructure and staff anticipate meeting to discuss ramifications and opportunities to collaborate on the development of a stormwater management plan to avoid or mitigate failures where possible.

STRATEGIC/BUSINESS PLAN CONSIDERATIONS

The Saltair Coastal Slope Stability Assessment supports Corporate Strategic Objective #3, protecting our communities from the adverse impacts of climate change.

GENERAL MANAGER COMMENTS ☐ Not Applicable

Referred to (upon completion):

- ☒ Communications & Engagement
- ☒ Community Services *(Cowichan Community Centre, Cowichan Lake Recreation, South Cowichan Recreation, Arts & Culture, Emergency Management, Facilities & Transit)*
- ☐ Corporate Services *(Finance, Human Resources, Legislative Services, Information Technology, Procurement)*
- ☒ Engineering Services *(Environmental Services, Recycling & Waste Management, Water Management)*
- ☒ Land Use Services *(Community Planning, Planning – Strategic Initiatives, Development Services, Inspection & Enforcement, Economic Development, Parks & Trails)*

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Reviewed for form and content and approved for submission to the Committee:

Resolution:

☒ Corporate Officer

Financial Considerations:

☒ Chief Financial Officer

ATTACHMENTS:
Attachment A –
Attachment B –