

District of North Saanich

OCP Marine Policy and Guidelines Recommendations

For Sea Level Rise Planning and Adaptation

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EXECUTIVE SUMMARY

Ongoing climate change is expected to lead to many changes including increased temperatures and as a result, increased ice melting and rising sea levels. Although the pace of these effects is still uncertain, this report is the start of a process initiated by the District of North Saanich (DNS) to assess, evaluate and plan for the expected effects of rising sea levels and the likely consequences around the shoreline of the district.

The purpose of this document is to provide recommendations to update the marine policies of the District of North Saanich (DNS), Official Community Plan (OCP) known as “Official Community Plan Bylaw No. 1130.

A review and assessment of the results and findings of the Flood Construction Level Study [13] found the following overall consequences:

- Nearly the entire shoreline of the DNS is exposed to a growing flood hazard related to the expected effects of climate change related sea level rise.
- The flood hazard occurs primarily to private properties and differs considerably in character around the shoreline.
- The most exposed areas of the shoreline are located in the Tsehum Harbour area and along Lochside Drive near the McTavish interchange.
- In many locations the future flood hazard is concentrated at the toe of steep cliffs and bluffs and in locations where the cliffs or bluffs are grounded on outcropping bedrock. In these latter situations it will be sometime before a flooding hazard materializes.
- In many other locations, the future hazard is concentrated at the toe of existing seawalls and the consequences will be concentrated either at or adjacent to the seawall base, on publically owned foreshore, or at the top of the seawall where overtopping wave action will create a increasing problem either from the flooding by the overtopping volume of water during storms, or from erosion and unravelling of the seawall or from erosion of the land immediately behind the seawall. If structures are located close to the seawall there may be a threat to the safety and security of personnel or to the structure during a coastal storm.
- The scale of the flooding hazard, in all cases, is dependent on individual situations; exposure, resources, relevant time frames and immediate needs and concerns, and is best evaluated and addressed on a site by site and individual by individual basis.

For this reason, three distinct measures are recommended:

1. Existing portions of the OCP should be amended to allow for future adaptation measures by individual parcel owners. These measures are addressed in Section 3.2.1 of this document.
2. The Tsehum Harbour and Lochside Drive areas of the DNS should be added to the OCP as Special Development Areas. These measures are addressed in Section 4.1.1 of this document.
3. A new Development Permit Area should be included in the OCP for the protection of future development from the growing flood hazard. These measures are addressed in Section 4.1.2, 4.2, and Section 5 of this document.

End of Executive Summary

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1 INTRODUCTION

1.1 Background

Ongoing climate change is expected to lead to many changes including increased temperatures and as a result, increased ice melting and rising sea levels. Although the pace of these expected effects is still uncertain, this report is intended as the start of a process initiated by the DNS to assess, evaluate and plan for the expected effects of rising sea levels and the likely consequences around the shoreline of the district.

The Province of British Columbia began the process of preparing the province for the upcoming effects of climate change with the publication of an adaptation strategy [1], which identified three key strategies to achieve a prepared and resilient community, as follows:

- *1: Build a strong foundation of knowledge*
This strategy is aimed at providing decision-makers (e.g. provincial ministries, local governments, private industry, etc.) the appropriate support needed to interpret and understand complex climate projections so that appropriate future adaptation decisions are made.
- *2: Assess risks and implement priority adaptation actions in sectors*
The risk of areas known to be sensitive to climate change must be assessed and adaptation implementation must be prioritized and staged.
- *3: Make adaptation part of Government's business*
In order to take action, the planning and implementation of climate change adaptation will be incorporated into government policies, legislations, and regulations.

As part of this initiative, the Province released three key Guideline documents [2], [3], [4] that provide guidelines focused on climate change adaptation including, specifically, the identification and management of coastal flood hazard land use [3]. These provincial Guideline documents stress the need to establish management parameters, such as a flood construction level (FCL), to limit risks and damage associated with sea level rise (SLR) and coastal flooding events.

In conjunction with the climate change adaptation Guideline documents, the Province has finalized its amendment to the current standing provincial Flood Hazard Management Guideline document [5], which covers all aspects of flood hazard management, including river and stream related flooding and tsunami hazards. The amendment of this document [5], has been posted to the Flood Safety website and will come into force on 1 January 2018 [6]. The work and recommendations described in this report are consistent with the Guideline amendment and the overall key provincial strategy.

As part of the initiative of the District of North Saanich to understand, assess and plan for adaptation to expected climate change and related sea level rise effects, SNC-Lavalin Inc. (SLI) was retained to define the Flood Construction Levels (FCLs) for the DNS, considering shoreline specific conditions including exposure to storm related winds, waves, storm surge and shoreline type and a 0.5 m and a 1.0 m SLR scenario. The findings of the Flood Construction Level definition work are provided in [13], which is referred to in this document as the FCL Study.

1.2 Purpose and Scope

The purpose of this document is to provide sea level rise adaption related recommendations to the ongoing process of assessing, discussing and planning revisions for updating of the District of North Saanich (DNS), Official Community Plan (OCP) known as “Official Community Plan Bylaw No. 1130. These recommendations reflect the results and assessment of the findings of the Flood Study on the consequences to the shorelines of the DNS.

The recommendations in this document have been developed bearing in mind the various strategies, objectives and recommendations outlined in existing planning documents; also relevant to the OCP; including the DNS Marine Task Force review [10], the NSCCAP report [14] and the CRD Regional Growth Strategy [8], where they are specifically related to or are affected by the results of FCL Study.

The recommended OCP policy amendments presented in this document relate to planning horizons that accommodate a 0.5m and 1.0m rise in sea levels. The Provincial updated guidelines recommend also planning for a 2 m rise in sea level, which in 2011 was estimated to occur in 2200. Recent science and assessments suggest a 2 m sea level rise will likely occur sooner than 2200; however, consideration and evaluation of recommendations for this more severe scenario has been deferred until the uncertainty related to the future rate of rise in sea level can be objectively reduced.

1.3 Consultation

Public consultations on the recommendations outlined in this report were held June 7, 2016, November 17, 2016, January 26, 2017 and another scheduled public consultation is forthcoming October 19, 2017 on marine policy planning, sea level rise and flood mapping. Draft changes to the Official Community Plan, including a proposed new development permit area were presented in January 26, 2017 and the forthcoming October 19, 2017 in public forums with survey opportunities at both. Seven surveys were completed at the January 26, 2017 forum (100 attendees).

The current version of this document reflects the comments made during public consultations occurring prior to the date of the current version of the document.

2 RELATIONSHIP OF EXISTING PLANNING TO THE FCL STUDY

2.1 Introduction

The principal existing framework of planning documents that relate to the findings and issues raised by the FCL Study, in chronological order are:

1. OCP Bylaw 1130, approved in 2007 and in the process of being updated.
2. The DNS Marine Task Force Report, prepared in 2008
3. The DNS Climate Change Action Plan, prepared in 2010
4. The CRD Regional Growth Strategy (DRAFT version 1.5) issued in March 2016.

It should be noted that of these documents, only the Regional Growth Strategy was prepared after the initial release of the three Provincial guideline documents [2][3][4], related to climate change, sea level rise and the resulting implications to British Columbia shoreline. Nevertheless, all four documents contain policy recommendations or conclusions that have meaning or overlap within the context of the findings of the FCL Study. These areas of overlap are briefly summarized in the remainder of Section 2.

2.2 Relationship of Existing Official Community Plan Bylaw No. 1130 to the FCL Study

A detailed review of the implications of the FCL Study to the current OCP Bylaw showed that many areas of the Bylaw need to be updated or revised to reflect the findings and results of the FCL Study. The current OCP also needs to be updated to reflect the outcome of the ongoing Regional Growth Strategy process. The affected areas are briefly summarized below and a more detailed clause by clause examination is provided in Section 3 of this report.

The existing OCP, dated 2007, has eight (8) main areas within the Bylaw document that are affected by the findings and results of the FCL Study:

1. OCP Section 3 relating to Environmentally Sensitive Areas
2. OCP Section 4, relating to Marine Areas
3. OCP Section 6, relating to Residential Areas
4. OCP Section 7, relating to Commercial Development
5. OCP Section 11, relating to Roads and Servicing
6. OCP Section 12, relating to General Development Policies
7. OCP Section 13, relating to Special Development Areas
8. OCP Section 14, relating to Development Permit Areas

It should be noted that a brief review of the District of North Saanich Zoning Bylaw (1255) was conducted as part of this assignment and some zones may contain elements that are influenced by the findings and results of the FCL Study. A review and development of potential changes is deferred until implementation of the recommendations of this document because the final form of amendments to the OCP could influence some zones.

2.3 Relationship of the FCL Study to the Marine Task Force Report

The Marine Task Force Report (MTFR) was prepared in 2008, after the current OCP was adopted by Council, and following an extensive four (4) year program of consultation with the DNS community of interest. The main focus of the process was the protection and enhancement of the economic and environmental marine assets of the DNS. The specific objectives of the Marine Task Force (MTF) were:

1. Review and possibly recommend changes to permitted use and restrictions of the current [2008] seven (7) marine zones around the North Saanich Peninsula.
2. Develop and recommend a method to inventory sensitive shoreline areas.
3. Review and assess effectiveness of existing [DNS] bylaws, policies and procedures with respect to marine foreshore developments.
4. Recommend new policies, as required, to protect marine environments and regulate new marine development, within the context of the OCP and federal and provincial regulations.

The Marine Task Force undertook extensive consultation with the community and addressed in detail key areas of the marine related aspects of the DNS including:

- Current marine and foreshore uses
- Existing boating and (marine) transportation facilities
- The existing (2007) Official Community Plan (OCP) and marine related components
- Zoning Bylaw No. 750, 1993 (repealed)
- Foreshore Lease Policies
- The existing (2008) North Saanich Permitting Process
- The current and expected future economic impact and outlook for the Marine Industry [in DNS]
- North Saanich Policy [marine] options
- Marine/Foreshore usage and zoning
- The existing Shoreline Inventory
- Review of relevant legislation, policies and procedures that address, protect and/or enhance Marine and Foreshore habitats

Details of the key findings and recommendations of the MTF are provided in the MTFR [10] and in a Staff Report to Council, dated 23 September 2008.

The Task Force work was undertaken prior to the release of the Provincial Government climate change related SLR reports issued in 2011 [2], [3], [4], and climate change effects or expected SLR were not explicitly considered by the MTF. There are some implications from the FCL Study findings and results that apply to the MTFR recommendations in varying degrees. A summary of the recommendations and how the FCL Study influences or affects a recommendation, is provided in Table 2-1 below.

Table 2-1 is ordered according to the degree to which the findings and results of the FCL Study affect the MTFR recommendations. Four (4) MTFR recommendations are directly affected by the FCL Study results. Ten (10) MTFR recommendations will be influenced to some degree by the FCL Study results and in most cases the FCL Study results will inform aspects of the issues or actions that are implied by the recommendations. As an example, the FCL Study results will likely be a consideration in the creation of plans or options for marina expansions or in the site selection and design process for a boat ramp on the west side of the Peninsula. The remaining six (6) MTFR recommendations, which largely relate to coordination or liaison actions to be undertaken, are not affected by the FCL Study.

Table 2-1: Summary of FCL Study Effects on MTR Recommendations

| MTR [*] Recommendation | General Recommendation | Influence of the FCL Study |
|------------------------------------|--|--|
| 1 | Better recognize marine heritage, economic contributions and boating interests of many of its residents. | The FCL Study and the proposed DPA 9 (Section 5 of this Document) is consistent with this MTR recommendation. |
| 13 | Develop a pro-active report to dealing with and remediating water pollution issues. | The FCL Study and the proposed DPA 9 (Section 4 of this Document) will help to minimize the entry of pollutants into the waters around the Peninsula as a consequence of flooding or coastal storm damage. |
| 14 | Develop guidelines for waste management, pump-outs and design standards. | The FCL Study and the proposed DPA 9 (Section 4 of this Document) are an element of the design standards that the MTR recommended be adapted and integrated into District practices. |
| 18 | Review policies pertaining to seawalls. | The FCL Study and the proposed DPA 9 (Section 4 of this Document) will inform adaptation strategies for waterfront land parcels and the design of any shoreline protection. |
| 2 | Support up to a 10% expansion in the current capacity of marinas. | No direct influence. Any marina expansion will need to consider the effects of SLR. |
| 3 | Discuss expansion options, land use and zoning changes with existing marinas. | No direct influence. Any marina expansion planning or design will need to consider the effects of SLR |
| 4 | Suggestions for Reconfiguration of Deep Cove Marina. | No direct influence. Reconfiguration concepts or design will need to consider the effects of SLR |
| 6 | Provide flexibility in dealing with rezoning requests for dry land storage. | No direct influence. The FCL Study and the proposed DPA 9 (Section 5 of this Document) will inform site selection and storage yard design. |
| 7 | Develop new guidelines for private docks. | No direct influence. DPA 9 (Section 5 of this Document) will inform design details of any shore connections for any docks. |
| 8 | Have District representation on the Tsehum Harbour Commission. | No direct influence. Tsehum Harbour Commission planning and developments will need to conform to the OCP. |

| MTFR [*] Recommendation | General Recommendation | Influence of the FCL Study |
|--|---|--|
| 10 | Development of a public boat ramp on the west side of the Peninsula. | No direct influence. The FCL Study and the proposed DPA 9 (Section 5 of this Document) will inform site selection and boat ramp design. |
| 11 | Develop a consultation process to review the issues surrounding beach access. | No direct influence. The FCL Study will inform aspects of assessment or design issues of the beach access and maintenance elements of this recommendation. |
| 17 | Develop policy to address the replacement of legal non-conforming docks. | No direct influence. The FCL Study and the proposed DPA 9 (Section 4 of this Document) will inform the replacement design. |
| 19 | Review the existing marine zones to simplify them and integrate the other MTFR recommendations. | No direct influence. The FCL Study and the proposed DPA 9 (Section 4 of this Document) will inform related zoning issues, which are outside of the scope of this study. |
| 5 | Keep boat shed regulations the same. | No effect. |
| 9 | Ask Parks Canada to consider designating parts of the Saanich Inlet as a Marine Park. | No effect. |
| 12 | Support for a Shoreline Inventory. | No effect. This inventory was completed in 2009 and the resulting SILAS Atlas [12] will inform all projects around the DNS shoreline. |
| 15 | Ensure the Zoning Bylaw is consistent with federal Private Buoy Regulations | No effect. |
| 16 | Liaise with the Integrated Land Management Bureau on Foreshore Leases. | No effect. |
| 20 | Consider a successor marine advisory group | No effect. |
| * Recommendations are numbered as in the Staff Report to Council dated 23 September 2008 regarding implementation of the MTFR. | | |

2.4 Relationship of the North Saanich Climate Change Action Plan to the FCL Study

The DNS Climate Change Action Plan (NSCCAP) was developed in 2010 to address Provincial government mandated requirements to reduce community GHG emissions. The NSCCAP focused on six (6) main areas of focus, of which, only two have any direct or indirect reference or relationship to the issues raised by the FCL Study. These areas were:

- Focus Area 1 – Green Building Program
- Focus Area 6 – Recommendations for appropriate action.

The recommendations in Focus Area 1 clearly speak to the interests in developing sustainable building programs in the District of North Saanich. Although the programs considered in the NSCCAP do not specifically apply to many of the issues relating to expected sea level rise and the consequences, the focus is relevant to the intentions of the DNS and need to adapt or at least inform developments in DNS of potential adaptation options.

The recommendations in Focus Area 6 focus on densification of existing communities to create mixed-use villages and providing opportunities for shared transit options that will reduce vehicle emissions. These recommendations identify potential village sites or transit centres in Deep Cove, Ardmore and one unspecified area adjacent to Bazan Bay and the McTavish Interchange. The District is not presently proceeding with the mixed use village concept.

The results of the FCL Study indicate these areas may be affected by sea level rise and associated consequences.

2.5 Relationship of the CRD Regional Growth Strategy to the FCL Study

The CRD's Regional Growth Strategy (RGS) [8], issued in 2016 under the auspices of the *Local Government Act*, aims to develop a vision for the Capital Region District for 2038 that recognizes fourteen (14) provincial goals in the *Local Government Act*, which include:

- Protect environmentally sensitive areas
- Encourage economic development that supports the unique character of communities
- Minimize the risks to settlement associated with natural hazards.

To this end the RGS specifically undertakes to:

“...promote human settlement that is socially, economically, and environmentally healthy and that makes efficient use of public facilities and services, land and other resources”.

The RGS outlines a vision that includes concentration of the future population in existing urban areas, a belt of protected green space from Saanich Inlet to Juan de Fuca around the perimeter of the metropolitan area and an increase in the use of public transit over single occupancy automobile use. The accomplishment of this vision at the local municipal level is achieved, by agreement, through the incorporation of the RGS objectives and policies into local municipality Official Community Plans (OCP).

Within the DNS, the RGS identifies, among other aspects:

- New growth opportunities in the vicinity of Tsehum Harbour and the Lochside Drive/McTavish interchange
- Preservation of Green and Blue Space in the Tsehum Harbour water area
- Preservation of Green and Blue Space around the northwest and west shorelines of the Saanich peninsula
- Reduction of development pressures on rural communities in the Saanich peninsula, while still allowing subdivision and some densification.

These areas are all affected to varying degrees by the findings of the FCL Study. Some of the relevant RGS policies that are affected by the findings and results of the FCL Study include:

- Protection of the Green/Blue belt running from Saanich Inlet and around the District shorelines
- Protection of the ecological integrity of the marine areas in the Green/Blue belt, through collaboration and public and private land stewardship programs
- Concentration of most new growth in areas that can be effectively concentrated by express bus transit (ie: the McTavish Interchange area)
- Protection of areas prone to flooding, or the incorporation of appropriate engineering and planning measures to mitigate risk.

The measures outlined in the remainder of this report are intended to assist in conforming to the RGS policies outlined above.

3 RECOMMENDATIONS FOR MARINE POLICIES TO ACCOMMODATE EXPECTED SEA LEVEL RISE

The implementation of marine policies that reflect or anticipate expected sea level rise depends on a number of factors that are inter-related as described below. One of the most important factors is determining what SLR scenario to plan for and specifically, what scenario is relevant to the issues addressed by the proposed marine policies.

A number of ongoing studies relevant to the future expected pace of SLR are being actively conducted by the global science community. Ongoing updates of the findings of these studies are showing that the rate of SLR is increasing faster than initially estimated. It is very possible that 0.5m and 1.0m of SLR may be seen as early as 2030 and 2050, respectively. Further measurement of air, surface and ocean temperatures, melting rates of global ice sheets and the rise of sea level over the coming years will lead to a more clear understanding of the likely pace of sea level rise. In the meantime, it is necessary to begin implementing new marine policies in order to minimize risks and damage associated with SLR and coastal flooding events.

The recommended amendments for the upcoming amendments to the current OCP relate to a planning horizon that accommodates a 0.5m and 1.0m rise in sea levels. Implementation of these policies should reflect these scenarios by applying, as a starting point, the FCLs from the recent FCL Study [7].

3.1 Available Tools

Literature on climate change frequently refers to a quartet of adaptation strategies which can be summarized as follows:

- **Protect** –building protective structures specifically for protecting private and public assets. Protection approaches and designs may be “hard” (e.g. by armouring the coastline with sea dikes, seawalls or riprap revetments) or “soft” (e.g. by constructing or augmenting storm berms, dunes, beaches and marshes).
- **Accommodate** –adapting land-based structures and activities to tolerate flooding and inundation.
- **Retreat** – a strategic decision to withdraw, relocate or abandon public or private assets that are at risk of being impacted by coastal hazards.
- **Avoid** – not developing in areas considered at moderate to high risk to a hazard.

A more in-depth definition of each strategy is available in [2].

In reality, the appropriate strategies can only be chosen after the exposure to sea level rise related flooding hazards is understood, the specific vulnerabilities of exposed areas are defined, and the consequences are understood. The appropriate strategy will depend on individual situations, exposure, resources, relevant time frames and immediate needs and concerns, and are best evaluated and chosen on a site by site and individual by individual basis. The results and findings of the FCL Study are a starting point for this evaluation process. The following parts of Section 3 provide a summary of changes to the existing OCP that are recommended to respond to and anticipate the implications of the FCL Study.

3.2 Recommended Changes to the OCP

This section reviews specific parts of the current OCP Bylaw No. 1130 (OCP), which are affected by SLR and the findings and results of the FCL Study. For each of these parts, the following are identified:

- Current OCP Policy Number that is affected by the FCL Study.
- Existing text of the affected current OCP Policy.
- Evaluation of the current policy, and explanation why there is a need to amend the policy.
- Recommended text to allow for SLR planning. Changes to the current text are highlighted in yellow.

3.2.1 OCP Sections 3 through 11

OCP Section 3 – Environmentally Sensitive Areas

The intent of the policies listed in this section is to provide guidance:

“...to ensure that future land and waterfront development is compatible with the physical nature, resources and limitations of the land base, and growth is planned to ensure a high level of protection for the environment” [9].

The FCL Study findings and results have no direct effect on the intent of the current policies presented in Section 3 of the current OCP. However, it is increasingly being recognized worldwide that environmentally sensitive areas, such as tidal marshes or beach areas can provide valuable service in reducing wave related effects to the adjacent shorelines. Enhancement of environmentally sensitive areas, in appropriate manner, can be of value when Protect or Accommodate options are selected by a community. In particular enhancement of the wave energy absorbing features of a shoreline can assist in building resilience for existing shoreline treatments. The recommended changes to this section of the OCP are summarized below in Table 3-1.

Table 3-1: "Recommendations to Policies - 3.1"

| 3.0 Environmentally Sensitive Areas | |
|---|--|
| Policy 3.1 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| Recognize ecologically sensitive areas by identifying and conserving special wildlife, plant and marine shore environments (such as pocket beaches) in their natural state. These are outlined on Schedule G and identified through the various development permit requirements. | <p>It is generally recognized that ecologically sensitive areas, such as pocket beaches and inter-tidal marshes and related marine vegetation can be beneficially used to build resilience capabilities along the shoreline to absorb and modify storm related wave energy.</p> <p>This suggested change to this section of Bylaw 1130 is intended to allow this the use of these areas in such a fashion where it can be justified.</p> |
| Recommended Policy | |
| Recognize ecologically sensitive areas by identifying and conserving special wildlife, plant and marine shore environments (such as pocket beaches and the Shoal Harbour Migratory Bird Sanctuary) in their natural state. These are outlined on Schedule G and identified through the various development permit requirements. Modifications that assist in building resilience to the effects of sea level rise will be permitted when justifiable. | |

OCP Section 4 – Marine Areas

Section 4 of the OCP provides guidance for the allocation of uses in the foreshore. The purpose of the policies in this section of the OCP is intended to allow for the protection of marine resources and reconcile the demands for the use and conservation of marine areas. Marine Areas are defined as all "areas of the District foreshore extending 300m from the shore" [9].

The implications of the FCL Study to Section 4 are summarized below.

OCP Section 4.1 – General Marine Policies

This section of the OCP provides general policies applicable to the marine areas as a whole.

The FCL Study has no implications to the current policies presented in Section 4.1. As a result, there are no recommended amendments to these general policies.

OCP Section 4.2 – Shoreline Components

This section of the OCP groups the DNS shoreline into four main types of shores and various objectives and policies are prescribed for each of the four shoreline type. The implications of the FCL Study and recommended amendments or changes are summarized below in Table 3-2.

Table 3-2: Recommendations to “Shoreline Components – Rocky Shores” in OCP Bylaw No. 1130

| Rocky Shores | |
|---|--|
| Policy 4.2.1 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| <p>To preserve the natural appearance of the rocky shoreline, no buildings or structures, or soil removal or deposit should be permitted within a minimum of 15 metres of the high water mark, except where it can be demonstrated to the District's satisfaction that a lesser distance is acceptable.</p> | <p>Rocky shores exist around the shoreline of the DNS in areas where coastal flooding is expected due to SLR. In some cases low lying bedrock outcrops at the toe of steep coastal bluffs, which will eventually become exposed to sea level rise or wave effects. The risk or magnitude of flooding, erosion and consequential land sliding can be effectively reduced by proper design and construction of coastal structures at the shoreline, including seaward of the existing or legal shoreline boundary. The existing policy does not allow this adaptation approach.</p> <p>The recommended policy change shown below is intended to allow for appropriate works within the 15 m setback along rocky shorelines, if they have the specific purpose of limiting or reducing the risk associated with coastal flooding.</p> |
| Recommended Policy | |
| <p>To preserve the natural appearance of the rocky shoreline, no buildings or structures, or soil removal or deposit should be permitted within a minimum of 15 metres of the high water mark, except where it can be demonstrated to the District's satisfaction that a lesser distance is acceptable, or where works are intended and designed to preserve the shoreline character and limit coastal flood-related effects.</p> | |

Table 3-3: Recommendations to “Shoreline Components – Beach Shores – Drift Sector Beaches” in OCP Bylaw No. 1130

| Beach Shores – Drift Sector Beaches | |
|---|--|
| Policy 4.2.2 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 4.2.3 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 4.2.4 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| Due to active erosion of Class 2 and 3 beaches, building prohibitions and soil deposit and removal restrictions shall be placed over lands within a 15 metre horizontal distance of the natural boundary adjoining beach shores, except where it can be demonstrated to the District's satisfaction that a lesser distance is acceptable. | <p>Drift sector beaches exist around the shoreline of the DNS in areas where coastal flooding is expected due to SLR. The risk or magnitude of flooding can be effectively reduced by proper design and construction or maintenance of beaches at the shoreline, including seaward of the existing or legal shoreline boundary. The existing policy does not allow this adaptation approach.</p> <p>The recommended policy change shown below is intended to allow for appropriate works within the 15 m setback along shorelines of drift sector beaches if they have the specific purpose of limiting or reducing the risk associated with coastal flooding.</p> |
| Recommended Policy | |
| Due to active erosion of Class 2 and 3 beaches, building prohibitions and soil deposit and removal restrictions shall be placed over lands within a 15 metre horizontal distance of the natural boundary adjoining beach shores, except where it can be demonstrated to the District's satisfaction that a lesser distance is acceptable, or where works are intended and designed to preserve the shoreline character and limit coastal flood-related effects. | |
| Policy 4.2.5 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |

Table 3-4: Recommendations to “Shoreline Components – Beach Shores – Pocket Beaches” in OCP Bylaw No. 1130

| Beach Shores – Pocket Beaches | |
|---|--|
| Policy 4.2.6 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| Building prohibitions and soil removal and fill restrictions shall be placed on lands within 15 metres horizontal distance landward of the high water mark adjacent to Class 2 or Pocket Beaches except where it can be demonstrated to the District's satisfaction that a lesser distance is satisfactory. | <p>Pocket beaches exist around the shoreline of the DNS in areas where coastal flooding is expected due to SLR. The risk or magnitude of flooding can be effectively reduced by proper design and construction or maintenance of beaches at the shoreline, including seaward of the existing or legal shoreline boundary. The existing policy does not allow this adaptation approach.</p> <p>The recommended policy change shown below is intended to allow for appropriate works within the 15 m setback along shorelines of pocket beaches if they have the specific purpose of limiting or reducing the risk associated with coastal flooding.</p> |
| Recommended Policy | |
| Building prohibitions and soil removal and fill restrictions shall be placed on lands within 15 metres horizontal distance landward of the high water mark adjacent to Class 2 or Pocket Beaches except where it can be demonstrated to the District's satisfaction that a lesser distance is satisfactory, or where works are intended and designed to preserve the shoreline character and limit coastal flood-related effects. | |
| Policy 4.2.7 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |

Table 3-5: Recommendations to “Shoreline Components – Mudflats, Marsh and Delta Shores” in OCP Bylaw No. 1130

| Mudflats, Marsh and Delta Shores | |
|--|--|
| Policy 4.2.8 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 4.2.9 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| Development immediately adjacent to a mudflat, marsh or delta area is discouraged. | <p>Shorelines composed of mudflats, marshes, or deltas have high ecological value and provide valuable wave energy absorption services. Some properties adjacent to these shorelines are expected to experience coastal flooding due to SLR. Specific measures within these properties can be taken to reduce the potential negative effects of flooding. The existing policy discourages development of these properties, which may hinder the properties' opportunity to apply adaptation measures.</p> <p>As of 2016, DNS has no plans to rezone areas adjacent to a mudflat, marsh, or delta. The recommended policy change is intended to provide opportunities related to development of these properties for the specific purpose of reducing the negative impacts of flooding.</p> |
| Recommended Policy | |
| Development immediately adjacent to a mudflat, marsh or delta area is discouraged. Consideration will be given to existing parcels where development is required to limit or reduce coastal flood-related effects. | |

OCP Section 6 – Residential

By law, the OCP is required to plan for and meet the anticipated housing needs for the DNS for at least five years. The aim of the policies provided in Section 6 of the OCP is to maintain and generate a range of parcel sizes to “support low and medium density residential development, in addition to supporting hobby farm and other rural activities adjacent to agricultural areas” [9].

Section 6 refers to the land use designations on Schedule B of the OCP, which forms a general guide to future land use and density. The FCL Study has identified areas along the DNS shoreline that are directly and indirectly affected by 0.5 and 1m of SLR. Of specific concern are two areas currently zoned as multi-family residential that fall within the SLR affected areas:

- Area East of McDonald Campground in the Tsehum Harbour area
- Area by McTavish Road & Lochside Drive

To address the potential risks associated with coastal flooding, it is recommended that DNS:

- *Create Special Development Areas for these two sites so that future developments better suit the neighbourhood and particular properties; or*
- *Future development can be informed by the provisions of DPA 9, which is described in more detail in Section 5 of this report.*

Other implications from the FCL Study, which relate to Special Development Area policies, are presented in Section 3.2.2 of this document. The following amendments, specifically, for OCP Section 6 are outlined in Table 3-6 below.

Table 3-6: Recommendations to “Residential” in OCP Bylaw No. 1130

| Residential | |
|--|---|
| Policy 6.1 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 6.2 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| To ensure that residential developments are compatible with the physical site conditions of slope, soil types and drainage patterns, and that natural features such as views, tree cover and variety in terrain are retained and enhanced, the siting of buildings, roads and utilities shall be accomplished in a manner which maintains any sensitive natural areas of the site and preserves the natural landscape. | <p>There are low-lying areas within the DNS where the FCL is greater than the parcel elevation. In some properties, physical site conditions and natural drainage patterns may encourage run-off from coastal wave effects to either converge around a habitable structure, or migrate to a lower lying neighbouring property.</p> <p>The FCL Study has identified areas that are susceptible to coastal flooding. The sentence appended to the end of the current policy is intended to allow for works requiring landscape alteration for the purpose of reducing the effects of coastal flooding. Landscape alteration should be designed such that ground surfaces slope away from structures, and should also be designed discourage the migration of water onto neighbouring properties. The purpose of this amendment is to allow for a parcel owner to alter his/her landscape as an adaptation option.</p> <p>The phrase “...does not negatively impact...” is included to make the policy more consistent with its original intent.</p> |
| Recommended Policy | |
| To ensure that residential developments are compatible with the physical site conditions of slope, soil types and drainage patterns, and that natural features such as views, tree cover and variety in terrain are retained and enhanced, the siting of buildings, roads and utilities shall be accomplished in a manner which does not negatively affect sensitive natural areas of the site and, preserves the natural landscape. An exception for slope alteration will be allowed if it is designed to help reduce effects of coastal flooding. | |
| Policy 6.3 through Policy 6.6 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 6.7 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| To encourage innovative housing and subdivision designs such as detached clustered residential developments, particularly for sloped upland areas, the District will provide flexibility in regulatory bylaws. Amenity bonusing, in compliance with Section 904 of the Local Government Act, will be supported in certain areas if site conditions warrant, in order to, amongst other things, preserve open space, natural tree cover and environmentally sensitive areas, leaving slopes unaltered. | This amendment reflects an update of reference from Local Government Act (LGA) Section 904 to LGA Section 482. This update is necessary as LGA Section 482 supersedes LGA Section 904. |
| Recommended Policy | |
| To encourage innovative housing and subdivision designs such as detached clustered residential developments, particularly for sloped upland areas, the District will provide flexibility in regulatory bylaws. Amenity bonusing, in compliance with Section 482 of the Local Government Act, will be supported in certain areas if site conditions warrant, in order to, amongst other things, preserve open space, natural tree cover and environmentally sensitive areas, leaving slopes unaltered | |
| Policy 6.8 through Policy 6.12 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |

Some further recommended amendments to the OCP, independent of the implications from the FCL Study, include amending OCP Schedule B Map and/or Zoning Bylaw No. 1255 Schedule A Map to resolve inconsistencies between the two documents.

The purpose of this amendment is to provide clarification to the overlap between OCP land designation for residential areas, and Zoning Bylaws for family residential and multi-family residential zones.

OCP Section 7 – Commercial Development

Commercial Development is a relatively minor aspect of the DNS land use pattern. DNS does not intend to create heavy commercial development, as these are already available in neighbouring municipalities, and is not consistent with the RGS (Section 2.2).

Areas designated as *commercial* and *marine commercial* as identified in Schedule B Map of the OCP, are generally waterfront properties, and consists mainly of marinas, BC Ferries' Swartz Bay Terminal, and the Institute of Ocean Sciences. Results of the FCL Study have no implications to the policy statements provided for either land-based or marine-based commercial uses. However, most of these commercial areas will be affected by expected future sea levels and therefore the proposed DPA 9, outlined further in Section 5 will apply to these areas.

Existing elements of commercial and marine commercial developments will tend to rise as sea levels rise, or as land based elements are modified to accommodate sea level rise. This may create changes to existing access or views from adjacent areas. Recommended changes to this section of the OCP are summarized below in Table 3-7.

Table 3-7: Recommendations to "7.0 COMMERCIAL DEVELOPMENT"

| 7.0 Commercial Development | |
|---|---|
| Land Based Commercial and Marine-Based Commercial Use – Policy 7.9 and Policy 7.15 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| Buildings used for commercial use must be buffered from adjacent rural and residential uses. | <p>4 As sea levels rise and a need to protect upland development from the implications of sea level rise emerges, water based commercial uses will likely adapt development to allow activities close to the water while protecting non essential water based activities (for instance offices or parking) behind protection options – floodwalls or sea dikes. Access to or views of related water bodies may be affected.</p> <p>Design options of this type are recognized and permitted in the Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate in BC, Appendix G24.</p> |
| Recommended Policy | |
| Buildings or structures used for commercial use must be buffered from adjacent rural and residential uses and should preserve access and views from adjacent rural and adjacent uses. | |

OCP Section 8.0 – Light Industry

The municipality accommodates some light industry which may be located on or adjacent to the District shorelines.

Existing elements of light industry developments will tend to rise as sea levels rise, or as land based elements are modified to accommodate sea level rise. This may create changes to existing access or views from adjacent areas. Recommended changes to this section of the OCP are summarized below in Table 3-8.

Table 3-8: Recommendations to "8.0 LIGHT INDUSTRY"

| 8.0 Light Industry Development | |
|---|---|
| Policy 8.5 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| Buildings used for commercial use must be buffered from adjacent rural and residential uses. | <p>As sea levels rise and a need to protect upland development from the implications of sea level rise emerges, water based commercial uses will likely adapt development to allow activities close to the water while protecting non essential water based activities (for instance offices or parking) behind protection options – floodwalls or sea dikes. Access to or views of related water bodies may be affected.</p> <p>Design options of this type are recognized and permitted in the Professional Practice Guidelines – Legislated Flood Assessments in a Changing Climate in BC, Appendix G24.</p> |
| Recommended Policy | |
| Buildings or structures used for commercial use must be buffered from adjacent rural and residential uses and should preserve access and views from adjacent rural and adjacent uses. | |

OCP Section 11 – Roads and Servicing

The FCL Study has shown that two portions along the existing main arterial transportation routes in the DNS; along the Patricia Bay Highway at Tsehum Harbour and the intersection with McTavish Drive and the southern portion of Lochside Drive may be affected by coastal storm wave-related effects.

Portions of West Saanich Road, where it is currently protected by a public walkway (Scoter Trail), are also indirectly threatened. This area was identified as an area of concern in the MTRF.

The implications of the FCL Study and recommended amendments specific to OCP Section 11 are summarized in Table 3-9 below.

Table 3-9: Recommendations to “Roads and Servicing” in OCP Bylaw No. 1130

| Roads and Servicing | |
|--|---|
| Policy 11.1 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| At the date of adoption of this plan, no new major roads are planned for the District with the exception of those shown on Schedule D. No phasing of any major roads is planned. | <p>The FCL Study has identified areas that may either be directly or indirectly affected by coastal storm wave-related effects. To reduce the potential negative impact on roads, developments must follow guidelines and policies required of in Development Permit Areas, one of which includes the draft DPA 9.</p> <p>The recommended changes to the existing policy mandates owner/developer to consider the effects of sea level rise through adherence of the draft DPA 9.</p> |
| Recommended Policy | |
| At the date of adoption of this plan, no new major roads are planned for the District with the exception of those shown on Schedule D. No phasing of any major roads is planned. Developments shall take into consideration possible sea level rise and the requirements of Development Permit Areas for the placement and construction of roads. | |
| Policy 11.2 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| The proposed network of bicycle paths is shown on Schedule D. | The recommended change to the existing policy requires owner/developer to consider the effects of sea level rise through adherence of the draft DPA 9. |
| Recommended Policy | |
| The proposed network of bicycle paths is shown on Schedule D. Developments shall take into consideration possible sea level rise and the requirements of Development Permit Areas for the placement and construction of bicycle paths. | |
| Policy 11.3 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| The areas that have received servicing are identified on Schedule E. No major expansions of municipal services are planned. There will be no expansion of services outside the North Saanich Servicing Area except for health, fire safety, or agricultural support reasons. | <p>To reduce the potential negative impact on services, it may be necessary to allow for works related to sea level rise adaptation.</p> <p>The recommended amendment to the policy allows for expansion and/or works related to sea level rise adaptation.</p> |
| Recommended Policy | |
| The areas that have received servicing are identified on Schedule E. No major expansions of municipal services are planned. There will be no expansion of services outside the North Saanich Servicing Area except for health, fire safety, or agricultural support, or sea level rise adaptation reasons. | |

OCP Section 12 – General Development Policies

The policies presented in Section 12 of the OCP are applicable to all land use designations. Table 3-10 summarizes the amendments that are recommended to this part of the current OCP so that it becomes consistent with the findings and results of the FCL Study.

Table 3-10: Recommendations to “General Development Policies” in OCP Bylaw No. 1130

| General Development Policies | |
|--|---|
| Policy 12.1 | |
| Current Text | Evaluation and Explanation of Need for Change |
| Development must be consistent with the goals and objectives of the Plan. | The purpose of this amendment is to provide recognition of the coastal flood-affected areas, and to enable the parcel owner to act on reducing the risks associated with coastal flood-affected areas. |
| Recommended Text | |
| Development must be consistent with the goals and objectives of the Plan. Development shall consider coastal flood-affected areas. These areas must incorporate appropriate adaptation measures. | |
| Policy 12.2 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 12.3 | |
| Current Text | Evaluation and Explanation of Need for Change |
| Development should be consistent with the retention of the visual landscape of natural areas, especially on or near the waterfront, hilltops and ridges. | <p>Some properties within the DNS are located in areas where coastal flooding is expected due to SLR. The risk or magnitude of the effects of SLR can be reduced by adopting site-specific adaptation measures.</p> <p>The recommended policy change is intended to allow for appropriate works with the specific purpose of limiting or reducing the risk and damage associated with coastal flooding.</p> |
| Recommended Text | |
| Development should be consistent with the retention of the visual landscape of natural areas, especially on or near the waterfront, hilltops and ridges. Flexibility will be given to development that incorporates adaptation measures that help reduce the risk and damage associated with the effects of coastal flooding. | |
| Policy 12.4 and 12.5 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 12.6 | |
| Current Policy | Evaluation and Explanation of Need for Change |
| No development or site alteration shall be permitted on a wetland, a riparian area or within the buffer zone specified in this bylaw for wetlands and riparian areas, except as permitted by law. | These areas, where exposed to the threat of future coastal flooding related to sea level rise, will likely become inundated resulting in coastal squeeze and loss of important wetland or riparian habitat. A sea level rise setback should be placed around these areas to maintain the objectives of the RGS to “...maintain and conserve Regional Green/Blue spaces on public and private lands...”. |
| Recommended Text | |
| No development or site alteration shall be permitted on a wetland, a riparian area or within the buffer zone or the sea level rise related setback , specified in this bylaw for wetlands and riparian areas, except as permitted by law. | |
| Policy 12.7 through 12.13 | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |

4.1.1 Special Development Areas

The current OCP identifies 6 areas within the DNS as Special Development Areas with the intention of recognizing these areas should be developed in an innovative manner that provides greater flexibility and enables development in a manner that best suits the area and the properties within the area. These six (6) areas are:

- Site 1 – Canoe Cove Marina
- Site 2 – East Saanich/Cresswell (Adjacent to Dean Park Estates)
- Site 3 – Baldwin Property
- Site 4 – Deep Cove Chalet
- Site 5 – Queen Mary Bay
- Site 6 – 9344 Ardmore Drive site

Four of these areas; Sites 1, 4, 5, and 6, are located on the waterfront and will be affected by SLR. Sites 2 and 3 are located inland and not affected by sea level rise.

The 4 SLR affected areas require some modifications to the current sections of the OCP as documented further below.

The results of the FCL Study have also shown that two other specific areas of the DNS will be significantly affected by sea level rise. In general terms these are:

- The Tsehum Harbour area
- The shoreline and adjacent areas Lochside Drive and the McTavish Interchange.

These areas should be added to the designation of Special Development Areas as the implications of sea level rise and the related effects will likely be the most important and consequential within the DNS boundaries.

These sites and results and findings of the FCL Study are discussed below.

OCP Section 13.1 – Special Development Area Site 1 – Canoe Cove Marina

The results of the FCL Study have no implications to the Justification or Policy Statement for this special development area (SDA). However, the FCL Study shows that this SDA is significantly affected by expected future sea levels and the proposed DPA 9 will apply here.

OCP Section 13.4 – Special Development Area Site 4 – Deep Cove Chalet

The results of the FCL Study have no implications to the Justification or Policy Statement for this SDA. However, the FCL Study shows that this SDA is partially affected by expected future sea levels and the proposed DPA 9 will apply here.

OCP Section 13.5 – Special Development Area Site 5 – Queen Mary Bay

Designating the two parcels of land at Queen Mary Bay as an SDA was justified for two reasons:

- Site's sensitive and important environmental assets,
- An intent to increase density in the area by creating detached housing clusters.

The FCL Study shows that this SDA is affected by expected future sea levels, and implies that if the densification is undertaken, development should be sited inland, away from the coastal wave-affected area. Schedule B of the OCP should also be revised.

Because a portion of the site is affected by expected SLR, the proposed DPA 9 will apply here.

If the District allows for a mix of attached and detached housing, Schedule B of the OCP must be revised to reflect multi-family residential land use.

OCP Section 13.6 – Special Development Area Site 6 – 9344 Ardmore Drive

The results of the FCL Study have no implications to the Justification or Policy Statement for this SDA. However, the FCL Study shows that this SDA is partially affected by expected future sea levels and the proposed DPA 9 will apply here.

OCP Section 13.5 – NEW - Special Development Area Site 7 – Tsehum Harbour

This area is significantly affected by the findings and results of the FCL Study. It is clear this area should be added to the list of Special Development Areas to conform to the Provincial Government updated guideline documents to identify Sea Level Rise Planning Areas where there is a threat of flooding due to expected SLR as a result of ongoing climate change.

Recommended changes to this section of the OCP are summarized below in Table 3-11.

Table 3-11: Recommendations "13 SPECIAL DEVELOPMENT AREAS"

| NEW – 13.7 Tsehum Harbour | |
|--|---|
| Current Text | Evaluation and Explanation of Need for Change |
| This SDA currently does not exist in OCP Bylaw 1130. | <i>This area is significantly affected by the findings and results of the FCL Study. It is clear this area should be added to the list of Special Development Areas to conform to the Provincial Government updated guideline documents to identify Sea Level Rise Planning Areas where there is a threat of flooding due to expected SLR as a result of ongoing climate change</i> |
| Recommended Text | |
| <p>Justification: The Tsehum Harbour area affected by future sea level rise, as delineated in DPA 14.11 maps 1 or 2, has been designated as a special development area, as mandated by the Provincial Guideline Memorandum Amendment – Section 3.5 and 3.6 – Flood Hazard Area Land Use Management Guidelines (FHALUMG) effective: 1 January 2018, for the following reasons:</p> <ul style="list-style-type: none"> a) The subject area contains significant residential, commercial, light industrial and parklands. b) The subject area contains significant environmental values to be accommodated in a sensitive manner and which could be protected through innovative design. c) The affected lands fall within the recommended provisions related to Sea Level Rise Planning Areas as defined in the FHALUMG. d) The area includes District infrastructure including utilities, sewer, roads and paths and water supply that are important to the District. e) The area forms the boundaries of the Shoal Harbour Migratory Bird Sanctuary, established in 1931. <p>Policy Statement: In designating these parcels of land as a special development area, the following planning principles shall be reflected for future development:</p> <ul style="list-style-type: none"> a) Existing land uses shall continue to be allowed. b) Development Permit Area DPA 14.11 shall apply. c) Development on existing lots shall conform with FHALUMG. d) The District shall engage in the development of a Long Term Flood Protection Strategy as outlined in Appendix 1 of FHALUMG. e) The Long Term Flood Protection Strategy shall consider the implications of policies applicable to the adjacent parcels in Sidney, BC. <p>The Province of BC's Long Term Flood Projection Strategy shall consider the benefits that might be realized from active stewardship of the Shoal Harbour Migratory Bird Sanctuary that are consistent with the standing policies of the <i>Canada Wildlife Act and Migratory Birds Convention Act, 1994</i>.</p> | |

OCP Section 13.8 – NEW - Special Development Area Site 8 – Lochside – McTavish Interchange

This area is significantly affected by the findings and results of the FCL Study. It is clear this area should be added to the list of Special Development Areas to conform to the Provincial Government updated guideline documents to identify Sea Level Rise Planning Areas where there is a threat of flooding due to expected SLR as a result of ongoing climate change.

Recommended changes to this section of the OCP are summarized below in Table 3-12.

Table 3-12: Recommendations to "13 SPECIAL DEVELOPMENT AREAS"

| NEW – 13.8 Lochside – McTavish Interchange | |
|---|---|
| Current Text | Evaluation and Explanation of Need for Change |
| This SDA currently does not exist in OCP Bylaw 1130. | <i>This area is significantly affected by the findings and results of the FCL Study. It is clear this area should be added to the list of Special Development Areas to conform to the Provincial Government updated guideline documents to identify Sea Level Rise Planning Areas where there is a threat of flooding due to expected SLR as a result of ongoing climate change</i> |
| Recommended Text | |
| <p>Justification: The Lochside McTavish Interchange Area affected by future sea level rise, as delineated in DPA 14.11 maps 1 or 2 has been designated as a special development area, as mandated by the Provincial Guideline Memorandum Amendment – Section 3.5 and 3.6 – Flood Hazard Area Land Use Management Guidelines (FHALUMG) effective: 1 January 2018, for the following reasons:</p> <ul style="list-style-type: none"> a) The subject area contains significant residential, commercial, light industrial, parklands and multi-jurisdictional transportation infrastructure. b) The affected lands fall within the recommended provisions related to Sea Level Rise Planning Areas as defined in the FHALUMG. c) The area includes District infrastructure including utilities, sewer, roads and paths and water supply that are important to the District. <p>Policy Statement: In designating these parcels of land as a special development area, the following planning principles shall be reflected for future development:</p> <ul style="list-style-type: none"> a) Existing land uses shall continue to be allowed. b) Development Permit Area DPA 14.11 shall apply. c) Development on existing lots shall conform with FHALUMG. d) The District shall engage in the development of a Long Term Flood Protection Strategy as outlined in Appendix 1 of FHALUMG. <p>The Long Term Flood Protection Strategy shall consider the implications of policies applicable to the adjacent parcels in Sidney, BC.</p> | |

4.1.2 Development Permit Areas

Development Permit Areas(DPA) are contained in the current OCP to cover 7 issues identified in the version of the LGA (RSBC 1996) that existed at the time of drafting of the OCP in 2007.

These DPAs are specifically:

- DPA 1: Marine Lands and Foreshore
- DPA 2: Creeks, Wetlands Riparian Areas and Significant Water Resources
- DPA 3: Sensitive Ecosystems
- DPA 4: Steep Slopes
- DPA 5: Commercial and Industrial
- DPA 6: Multi-Family Dwellings

- DPA 8¹: Intensive Residential Development

Since 2007, the *LGA* has been revised and updated. Under section 488 of the latest version of the *LGA* ², the number of purposes for which Development Permit Areas can be designated is summarized below in Table 3-13.

The release of the Provincial guidelines for climate change adaptation [2][3][4] have clearly recognized that SLR and the related coastal storm effects (and related river flow where appropriate) will increase existing and create new flooding hazards. This evolving flooding hazard is consistent with item *b: Protection of development from hazardous conditions* in Table 3-13.

Table 3-13
(from Section 488 of *LGA, RSBC 2015*)

- “
- a. *Protection of the natural environment, its ecosystems and biological diversity;*
 - b. *Protection of development from hazardous conditions;*
 - c. *Protection of farming;*
 - d. *Revitalization of an area in which a commercial use is permitted;*
 - e. *Establishment of objectives for the form and character of intensive residential development;*
 - f. *Establishment of objectives for the form and character of commercial, industrial or multi-family residential development;*
 - g. *In relation to an area in a resort region, establishment of objectives for the form and character of development in the resort region;*
 - h. *Establishment of objectives to promote energy conservation;*
 - i. *Establishment of objectives to promote water conservation;*
 - j. *Establishment of objectives to promote the reduction of greenhouse gas emissions.*
- ”

While our review of the current OCP has identified some areas of the existing DPAs where amendment is required to be consistent with the findings and results of the FCL Study, we recommend that a new DPA be created to deal specially with the growing implications of flooding as a result of climate change related sea SLR and the related storm effects. This new DPA (termed DPA 9 at this time) should be distinct from the current DPA 1 to keep separate the issues relating to the interaction of development and conservation (DPA 1), which will persist into the future in their own ways, as, for instance, the marine environment and ecology evolve as a result of climate change, and the issues relating to the interaction between development and the growing hazard related to flooding.

¹ DPA 7 was re-numbered to DPA 6 in the current OCP.

² *Local Government Act (LGA)*, RSBC 2015, was made current on October 26, 2016 and contains additional issues for which a DPA can be created.

A draft version of the recommended DPA 9 is provided in Section 5 of this document.

Specific changes required to Section 14 of the current OCP, to make it consistent with the findings and results of the FCL Study are summarized below, for the remainder of Section 3 of this document³.

OCP Section 14.1 – General Development Permit Guidelines

No changes to the guidelines provided in Section 14.1 of the current OCP are recommended.

OCP Section 14.2 – General Exemptions from Requirement for a Development Permit

Section 14.2 (General Exemptions from Requirement for a Development Permit) contains 17 clauses, of which several are affected by the results and findings of the FCL Study. These are itemized in separate tables below for clarity.

³ It should be noted that in the current OCP, the designation reference for the current DPAs refer to Section 919.1(1)(a) of the *LGA (RSBC 1996)*. These references should all be amended to reference Section 488(1)(a) of the updated *LGA (RSBC 2015)*.

Table 3-14: Recommendations to “General Exemptions from Requirement for a Development Permit”
Sections 14.2.1 a) through 14.2.1 c)
OCP Bylaw No. 1130

| General Exemptions from Requirement for a Development Permit | |
|---|---|
| Policy 14.2.1 a) and b) | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 14.2.1 c) | |
| Current Text | Evaluation and Explanation of Need for Change |
| <p>...in Development Permit Areas, No. 5 and No. 6, for the construction of fencing and structures less than or equal to 40 m² (430.6 ft²) which are accessory to an existing principal structure. Such accessory structures may include the following:</p> <ul style="list-style-type: none"> - Additions to commercial and industrial buildings - Gazebos - Garden sheds - Tool sheds - Decks | <p>DPA 5 and 6 pertain to commercial/industrial and multi-family areas, respectively. A number of areas designated under these DPAs are in areas where coastal flooding is expected due to SLR.</p> <p>The existing policy exempts the requirement for a DP for accessory structures less than or equal to 40m² (430.6 ft²), including; additions to commercial and industrial buildings, garden sheds and tool sheds. Additions to commercial and industrial buildings tend to become permanent fixtures to an existing permanent structure. Providing exemption to these additions while knowing that the parcel will eventually experience flooding may be a potential liability issue.</p> <p>Additions to commercial and industrial buildings, garden sheds and tool sheds also tend to contain hazardous or toxic substances (ie: chemicals, fertilizer and fuel) or goods sensitive to flooding. If flooded, these types of substances and materials pose an environmental risk to the marine and shoreline environment.</p> <p>The recommended policy change removes these exemptions and eliminates a liability that may arise..</p> |
| Recommended Text | |
| <p>...in Development Permit Areas, No. 5 and No. 6, for the construction of fencing and accessory structures less than or equal to 40 m² (430.6 ft²), which are accessory to an existing principal structure. Such accessory structures may include the following:</p> <ul style="list-style-type: none"> - Additions to commercial and industrial buildings - Gazebos - Garden sheds - Tool sheds - Decks | |

Table 3-15: Recommendations to “General Exemptions from Requirement for a Development Permit”
Sections 14.2.1 d) through 14.2.1 e)
OCP Bylaw No. 1130

| General Exemptions from Requirements for a Development Permit | |
|---|---|
| Policy 14.2.1 d) | |
| Current Text | Evaluation and Explanation of Need for Change |
| ...in Development Permit Areas No. 1, 2, 3 and 4, for changes to the height of an existing building, including the addition of another storey, providing there is no increase in the building footprint; | <p>Areas within DPA 1, 2, 3 and 4 may be located in areas where coastal flooding due to SLR is expected.</p> <p>Changing the height of an existing building is a development that involves substantial works. This type of development implies an increase of the structure's overall service life, which could extend to a time when 0.5m SLR or 1.0m SLR is expected. It is important for parcel owners to incorporate the minimum required FCLs to reduce the potential risk and damage associated with coastal flooding.</p> <p>The recommended policy change maintains the flexibility of a parcel owner to add an additional storey, but requires the parcel owner to adhere to the guidelines presented in draft DPA 9.</p> |
| Recommended Text | |
| ...in Development Permit Areas No. 1, 2, 3 and 4, for changes to the height of an existing building, including the addition of another storey, providing there is no increase in the building footprint; however, DPA 9 will apply; | |
| Policy 14.2.1 e) | |
| Current Policy | Evaluation and Explanation of Need for Change |
| ...in Development Permit Areas No. 1, 2, 3 and 4, for structures which are 10 m ² (107 ft ²) or less in size providing they are sited more than 15 metres from a natural marine shoreline; | <p>Some areas within the designated DPA 1, 2, 3 and 4 are located in areas where coastal flooding due to SLR is expected.</p> <p>Structures such as a garden/tool sheds, gazebos, etc. are examples of typical structures with a footprint of roughly 10m² or less. These buildings may or may not be temporary, and may be affected by the 0.5m and 1.0m SLR.</p> <p>The current policy exempts a development permit only if the structure is sited inland of the setback identified in DPA 1 (i.e. 15m). With the introduction of the new draft DPA 9, the recommended policy change requires the structure to be sited inland of the setbacks identified in both DPA 1 and draft DPA 9, in order to limit the potential risk and damage associated with coastal flooding.</p> |
| Recommended Policy | |
| ...in Development Permit Areas No. 1, 2, 3 and 4, for structures which are 10 m ² (107 ft ²) or less in size providing they are sited inland of the setbacks described in DPA 1 and DPA 9. | |

Table 3-16: Recommendations to “General Exemptions from Requirement for a Development Permit”
Sections 14.2.1 f) through 14.2.1 q)
OCP Bylaw No. 1130

| General Exemptions from Requirements for a Development Permit | |
|---|---|
| Policy 14.2.1 f) | |
| Current Text | Evaluation and Explanation of Need for Change |
| ...emergency works including tree cutting necessary to remove an immediate danger or hazard; | <p>Section 14.11 defines “development” to include “flood protection works”.</p> <p>The current policy considers tree cutting for the purpose of removing immediate danger or hazard as a type of “emergency works”. Along the same lines, if an exemption to flood protection works for the purpose of removing immediate danger or hazard is not provided, it will not be possible to prevent or reduce damage from effects of SLR.</p> <p>The recommended policy change provides the parcel owner the flexibility to, take measures (for example, sandbag his/her property before an expected high tide storm event in order) to reduce potential damage that could result from coastal floods.</p> |
| Recommended Text | |
| ...emergency works including tree cutting and coastal flood-related mitigation measures necessary to remove an immediate danger or hazard; | |
| Policy 14.2.1 g) through p) | |
| There are no implications from the FCL Study, therefore no changes to the OCP Policy are recommended. | |
| Policy 14.2.1 q) | |
| Current Text | Evaluation and Explanation of Need for Change |
| ...in Development Permit Area 8, for the construction or alteration of a single family residential dwelling, except that this exemption does not apply to any parcel having an area equal to or less than five hundred square metres and created by a plan of subdivision registered in the Land Title Office after September 8, 2014. | <p>The land areas covered by DPA 8 include the proposed Special Development Area Site 7 (Tsehum Harbour) and draft Special Development Area Site 8 (Lochside-McTavish). These areas will be significantly affected by the effects of SLR.</p> <p>The recommended change in this policy requires a development permit for areas that fall within the draft DPA 9. The purpose of this modification is to protect the lands within the DPA 8 that will be significantly affected by SLR effects.</p> |
| Recommended Text | |
| in Development Permit Area 8, for the construction or alteration of a single family residential dwelling, this exemption does not apply to any parcel having an area equal to or less than five hundred square meters and created by a plan of subdivision registered in the Land Title office after September 8, 2014. This exemption does not apply to all parcels in Development Permit Area 8 that also fall within the area of DPA 9 | |

Recommended changes to specific existing Development Permit Areas in the OCP are discussed below.

OCP Section 14.3 – DPA#1 – Development Permit Area No. 1 – Marine Uplands and Foreshore

This DPA is intended to regulate development along the shoreline, foreshore and uplands to provide long-term protection for the ecological values of those areas. The applicable area includes the area extending 15 m inland from the high water mark, around the entire shoreline of the District.

As sea levels rises, the reference datum “the high water mark”, will move inland. The actual meaning of “high water mark” is not defined in the current OCP; however, it shares a conceptual basis with the “natural boundary”⁴ as referenced in the *Land Act*. The reference datum “the high water mark” is also indirectly counter referenced in Section 14.2.1 e) of the current OCP as “a natural marine shoreline”, which is also consistent with the “natural boundary”. All three terms are difficult to interpret in the field when shoreline protection, which eliminates both a “natural boundary” and “a natural marine shoreline” has been constructed and are impossible to define looking into the future when sea level occurs and the shoreline adjusts in response.

For clarity and consistency, it is recommended that the terms “high water mark” and “natural marine shoreline” are replaced by the term “estimated future natural boundary as defined in the Provincial Guideline document [3]”. This amendment will make DPA 1 consistent with DPA 9, which is discussed in more detail below.

OCP Section 14.4 – DPA#2 – Development Permit Area No. 2 – Creeks, Wetlands, Riparian Areas and Significant Water Resources

The FCL Study findings and results have no significant direct effect on the areas or objectives considered in this DPA.

OCP Section 14.5 – DPA#3 – Development Permit Area No. 3 – Sensitive Ecosystems

The FCL Study findings and results have no significant direct effect on the areas or objectives considered in this DPA.

OCP Section 14.6 – DPA#4 – Development Permit Area No. 4 – Steep Slopes

The FCL Study findings and results have no significant direct effect on the areas or objective considered in this DPA, because, specifically, the DPA already requires a Qualified Professional to provide a Slope Stability Plan showing how a proposed development is to be designed and constructed in order to prevent

⁴ The “Natural Boundary” is defined in the *Land Act* as: “...the visible high watermark of any lake, river, stream or other body of water where the presence and action of the water are so common and usual and so long continued in all ordinary years as to mark upon the soil of the bed of the lake, river, stream or other body of water a character distinct from that of the banks thereof, in respect to vegetation, as well as in respect to the nature of the soil itself....for coastal areas, the natural boundary shall include the natural limit of permanent terrestrial vegetation.”.

any destabilization or erosion of the slope. As sea levels rise, the toe of many slopes around the shoreline of the DNS will become exposed to wave effects, mainly in areas where the existing slope is perched on an exposed bedrock outcrop, which, in time, will become inundated by rising sea levels. The risk is mainly on a site by site basis and the existing DPA should be sufficient to deal with this risk.

As the pace of sea level rise becomes more certain with time, the existing provision in DPA 4 can and should be revisited.

OCP Section 14.7 – DPA#5 – Development Permit Area No. 5 – Commercial and Industrial

All references to Section 919.1(1)(f) should be amended reference Section 488(1)(f) to maintain consistency with the updated LGA.

Note: commercial lands (land, marine, and educational) identified in Schedule B does not completely agree with commercial lands identified in Map for DPA#5. It is recommended that DNS review and revise the maps so that the content of both maps are in agreement.

OCP Section 14.8 – DPA#6 – Development Permit Area No. 6 – Multi-Family Dwellings

All references to Section 919.1(1)(f) should be amended to reference Section 488(1)(f) to maintain consistency with the updated LGA.

OCP Section 14.10 – DPA#8 – Development Permit Area No. 8 – Intensive Residential Development

All references to Section 919.1(1)(e) should be amended to reference Section 488(1)(e) to maintain consistency with the updated LGA.

4.2 Recommended Additions to OCP Bylaw No. 1130

The principal outcome of this review of existing marine policies in the DNS is that a new Development Permit Area should be created to allow the DNS to establish detailed guidelines for future development within the Permit area. A draft of the proposed DPA is provided in Section 5 of this document.

5 DRAFT DPA 9 – Sea Level Rise Coastal Flood Hazard Areas

5.1 Designation

Those areas of the District of North Saanich shown on Development Permit Area DPA 9 Maps are designated as a development permit area pursuant to Section 488 of the *Local Government Act* (LGA) for protection of development from hazardous conditions. This Development Permit Area includes all land parcels subject to direct or indirect future flooding, as indicated by the expected Flood Construction Level (FCL) for 0.5 m or 1.0 m of sea level rise (SLR) on Development Permit Area 9 maps.

5.2 Justification

Section 488(1) (b) of the LGA authorizes the local government to designate development permits where protection of development from hazardous conditions can be justified. Both existing and new development may be damaged by future coastal flooding related to sea level rise. The provincial government has recognized that future coastal flooding is a hazard and planning and adaptation measures are justified.

5.3 Objective

The objective of this Development Permit Area is to manage development in areas exposed to the present or future flooding from the combined effects of sea level rise and coastal storms in a manner that protects development from such hazardous conditions and reduces the risk to life, property, public safety and related consequences.

5.4 Geographic Areas

The affected areas are indicated on Development Permit Area 9 maps. The Development Permit Area guidelines apply to all parcels either partially or entirely within the Development Permit Area 9 maps and also including, additionally, parcels immediately adjacent to parcels that are either partially or entirely threatened by future flooding. The Development Permit Area should not be interpreted as a prohibition on development activity but as identification of areas where professional assessment and specific development adaptation measures are required.

5.5 Development Type

For the purpose of this DPA, there are four types of developments:

- 1 New builds and construction on undeveloped lands
- 2 New builds and construction on previously-developed lands
- 3 Substantial renovation of buildings
- 4 Minor renovations, maintenance and repair of buildings

The definition of these types of development is provided below.

New Builds and Construction on Undeveloped Lands

This pertains to development that will be started after the establishment of Development Permit Area 9. New development on undeveloped lands must plan for a 1.0m SLR scenario.

New Builds and Construction on Previously-Developed Lands

This pertains to development where an existing structure will be demolished and a new structure will be constructed. New Builds on previous developed lands must plan for a 1.0m SLR scenario

Substantial Renovation of Buildings

This pertains to development where an existing structure will be substantially modified, including major renovations or additions. These works will extend the building life span. Substantial renovation must plan for a 1.0m SLR scenario.

Minor Renovations, Maintenance and Repair of Buildings

This pertains to development that currently exists and where there is no change to the existing building footprint.

Minor developments, including interior renovation, maintenance or repair of buildings, which require a building permit of any kind, must plan for a 0.5m SLR scenario.

5.6 Parcel Category

Affected land parcels identified on the Development Permit Area 9 maps can be grouped into one of four (4) categories based on the extent of flooding expected on the land parcel. These categories are:

- Category 1 – Parcel is not directly affected: The FCL elevation does not encroach onto the existing ground of the parcel.
- Category 2 – Parcel is partially affected: The FCL elevation encroaches less than the present 15m setback on the existing ground of the parcel.
- Category 3 – Parcel is partially flooded: The FCL elevation encroaches beyond the present 15m setback, but does not flood the entire parcel.
- Category 4 – Parcel is completely inundated: The FCL elevation encroaches on the entire parcel and may extend further inland.

Indirectly affected parcels, which may or may not be waterfront parcels, may be exposed to a flooding risk because neighbouring parcels are exposed to flooding. Indirectly affected parcels are broken into two (2) categories:

Category 5 – Parcel is adjacent to a parcel where some flooding is expected.

Category 6 – Parcel is adjacent to a completely inundated parcel.

The FCL on an indirectly affected parcel is the greater of the FCL for the adjacent and the indirectly affected parcel unless an Independent FCL Report is provided.

5.7 Flood Construction Level

The FCL indicated on the Development Permit Area Maps 1 and 2 applies to buildings, according to the Development Type and Parcel Category, as indicated in Table 5-1. It should be noted that new buildings also need to conform to Setback requirements, as indicated in Table 5-2.

Table 5-1: Flood Construction Level Guidance

| Development Type | Parcel Category | | | | | |
|---|-------------------|-----------|-----------|-----------|---------------------|-----------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | Directly Affected | | | | Indirectly Affected | |
| 1 New Build/Construction (Undeveloped Land) | NA | NA | 1 m SLR | 1 m SLR | 1 m SLR | 1 m SLR |
| 2 New Build/Construction (Developed Land) | NA | NA | 1 m SLR | 1 m SLR | 1 m SLR | 1 m SLR |
| 3 Substantial Renovation | NA | 1 m SLR | 1 m SLR | 1 m SLR | 1 m SLR | 1 m SLR |
| 4 Minor Renovation | NA | 0.5 m SLR | 0.5 m SLR | 0.5 m SLR | 0.5 m SLR | 0.5 m SLR |
| NA: Does not apply | | | | | | |

Relaxation to the designated FCL

A development may be granted a relaxation for the designated FCL if:

- The owner demonstrates with a report and plans that show that due to existing site characteristics and the location of the existing structure, it is impractical to meet the FCL requirements
- The owner demonstrates with a report, with building specifications and with plans that the proposed construction methods are designed to mitigate flood damage
- The owner provides a report certifying that habitable space in the building will provide a safe haven from flooding in the event the Designated Storm creates a flood hazard.

The owner of indirectly affected lots may be granted a relaxation for the designated FCL if the owner demonstrates with a report and plans that show that flow or drainage from adjacent parcels do not affect the parcel in question.

The report and plans prepared in regard to this exemption shall be prepared and stamped by a qualified Professional Engineer with demonstrated coastal engineering experience.

5.8 Setback

Existing Flood Hazard Management Guidelines in British Columbia, [5] and DNS DPA 1, require setbacks for buildings based either on the location of the Natural Boundary or, in the case of erodible bluffs, based on the location of the toe of the bluff. As sea levels rise, the location of the toe of the bluff will likely change as might the slope of the bluff. Both situations require an estimate of the Future Natural Boundary.

The procedure for estimating the location of the relevant Future Natural Boundary is defined in the updated Provincial Guideline [3].

The elevation of the Future Natural Boundary is determined by subtracting the freeboard allowance contained in the FCL (equal to 0.6 m in most cases). The location of the Future Natural Boundary contour is defined by the unbroken intercept of the resulting elevation with the existing ground elevation across the full width of the relevant land parcel.

Table 5-2: Minimum Setback Requirement

| Development Category | Land Parcel Category | | | | | |
|--|----------------------|------|------|----|---------------------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | Directly Affected | | | | Indirectly Affected | |
| 1 New Build/Construction (Undeveloped Land) | 15 m | 15 m | 15 m | * | 15 m | 15 m |
| 2 New Build/Construction (Developed Land) | 15 m | 15 m | 15 m | * | 15 m | 15 m |
| 3 Substantial Renovation | NC | NC | NC | NC | NC | NC |
| 4 Minor Renovation | NC | NC | NC | NC | NC | NC |
| <p>The indicated setbacks are the minimum. Setbacks where a coastal bluff exists may be greater due to the considerations defined in DPA 1.</p> <p>*: Parcels that will be completely inundated will require an Adaptation Report.</p> <p>NC: No change to the existing setback.</p> | | | | | | |

Relaxation to the designated Setback

A development may be granted a relaxation for the designated Setback if:

- The owner demonstrates with a report and plans that show that due to existing site characteristics and the location of the proposed new structure, it is impractical to meet the Setback requirements

- The owner demonstrates with a report, with building specifications and with plans, that flood protection and erosion protection works will be built to mitigate flood and erosion damage
- The owner provides a report certifying that habitable space in the building will include a safe haven if a reduced setback is provided.

The owner of indirectly affected lots may be granted a relaxation for the designated Setback if the owner demonstrates with a report and plans that show that flow or drainage from adjacent parcels do not affect the parcel in question.

The report and plans prepared in regard to this exemption shall be prepared and stamped by a qualified Professional Engineer with demonstrated coastal engineering experience.

5.9 Guidelines

Development permits issued in the applicable areas shall be in accordance with the following guidelines:

5.9.1 Mandatory Report

All developments must provide a Mandatory FCL/Setback Report, prepared and stamped by a qualified Professional with relevant expertise, showing how the proposed development is to be designed and constructed to conform with the Flood Construction Guidance and the Minimum Setback Requirement. The Mandatory Report must include details and conformation that the proposed development includes measures to safeguard neighbouring properties and structures from hazards arising from the siting, preparation of the site and construction of the proposed development.

5.9.2 Flexibility

The purpose of this section is to identify where site specific flexibility is available for defining/refining FCLs on a single parcel.

The Flood Construction Levels provided on Development Permit Area 9 map(s) were obtained using wave and shoreline characteristics typical over each shoreline reach indicated on the DPA 9 maps. Within each reach, particulars of the specific area, including nearshore bathymetry or atypical shoreline treatment, may justify a site specific estimate of the appropriate FCL.

Parcel owners or developers may undertake a parcel specific FCL Study and provide an Independent Report, with a revised FCL, according to the guidelines provided below for Independent FCL Report Requirements. It should be noted that a parcel specific FCL Study may not result in a reduction in the FCL.

An Independent Report must account for parcel specific details of wave exposure and shoreline characteristics. An Independent Report must be provided when a substantial modification to an existing shoreline configuration is proposed as part of the Development. When a parcel specific Independent FCL Report is completed and accepted by DNS, the FCL Independent Report value supersedes the value on Development Permit Area 9 map(s), provided that the Independent FCL Report conforms to the DPA 9 Guidelines.

Independent FCL Report Requirements

An Independent FCL report is mandatory when alteration of the parcel specific shoreline edge is proposed.

The FCL report shall be prepared by a qualified Professional Engineer with demonstrated coastal engineering experience.

The FCL Report shall, at a minimum, include the following:

- Identification of Site and location of specific area of interest
- Estimate of nearshore wave height/s used in estimating the FCL
- Mapped detail of the shoreline and plans of any proposed shoreline changes or character used in estimating the FCL
- Estimated average of overtopping volume rate used in estimating the FCL
- Estimated value of FCL
- Recommended wave affected setback zone
- Effect of any drainage on neighbouring properties
- Signature and seal of a B.C. registered professional engineer with demonstrated experience in coastal engineering

The FCL Report shall demonstrate that the following have been incorporated:

- Methodology – methodology and guidance provided by the Provincial guidelines must be followed.
- Wave Climate – wave climate information at the 10m CGVD28 depth contour, provided by the District of North Saanich, shall be used as a basis for estimating FCLs. The qualified professional is responsible for appropriately transforming the waves to the nearshore, at the location of interest. If the area of interest spans a length of shoreline with varying incident wave conditions, this variation across the site must be accounted for when refining and estimating the FCL.
- Total Water Level – the independent FCL report must identify the combination of incident wave conditions, storm surge, tide and SLR for all exposures at the location of incidence, for a consistent level of risk.
- Shoreline Composition - independent FCL must accurately reflect the proposed shoreline structure at the specific location of interest
- Consideration of neighbouring properties – Any proposed shoreline change must not increase the risk of flooding on an adjacent/neighbouring parcel.
- Wave Effects – The calculation of wave effects at the proposed shoreline edge must provide wave overtopping below the mean average volumetric rate threshold of 10L/m/s, unless acceptable means and methods are provided to accommodate increased overtopping.

Supplementary Information

The independent FCL Report shall include reports prepared by Qualified Professionals that provide the necessary information for the following related considerations:

- Archeological
- Environmental, including marine, terrestrial and any requirements necessary to conform to wildlife related (for example: migratory bird) issues. The SIPAS Technical Report [12] will be an acceptable base reference for the identification of sensitive marine or terrestrial (marine riparian) areas as part of DPA 9.

Notification and Consultation

The independent FCL report shall include documentation of notifications and consultation undertaken with adjacent parcel owners.

5.9.3 Adaptation Report

New Builds or Construction development on lands in Land Parcel Category 4 that are unable to meet the Minimum Setback Requirements must submit an Adaptation Report, prepared by a Qualified Professional, with demonstrated adaptation expertise or experience, that defines:

- The vulnerability of the site to flooding hazard from sea level rise coastal floods
- A risk assessment for the site and the risk management plan
- Measures to be incorporated to increase site resilience and to allow future adaptation options.
- Plans and building and material specifications that demonstrate how the development will be undertaken and operated.

A development that requires an Adaptation Report should expect to enter into a covenant registered against the land title, which may include a waiver clause to cover existing buildings or structures retained on the property.

5.10 Revision of DPA 9

As the future rate of rise of sea level due to ongoing climate change is uncertain, but most likely to be faster than presently envisaged, DPA 9 will be reviewed and revised at periodic intervals. The latest approved version will always govern at the time of development.

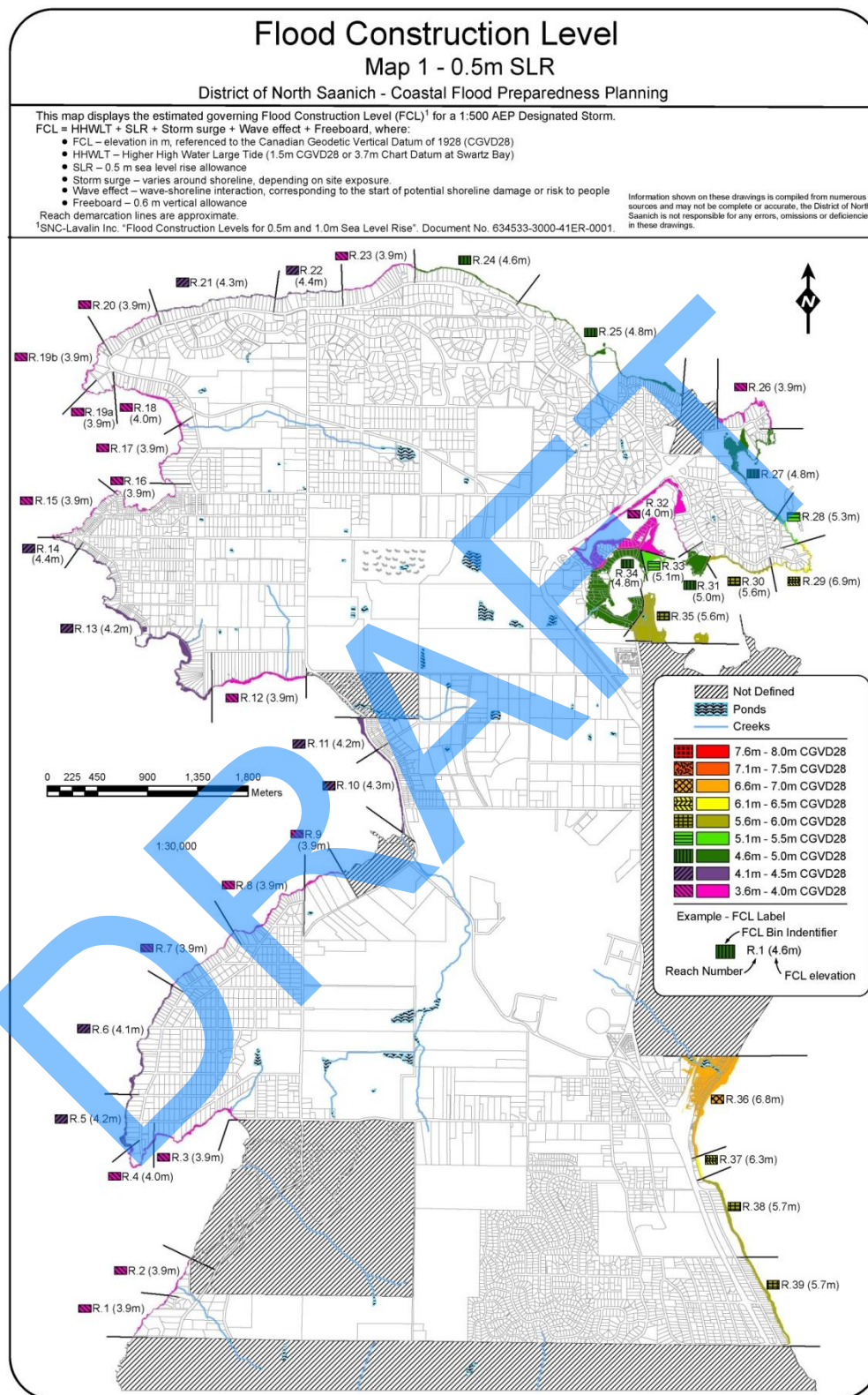


Figure 1: DPA 9 Map 1

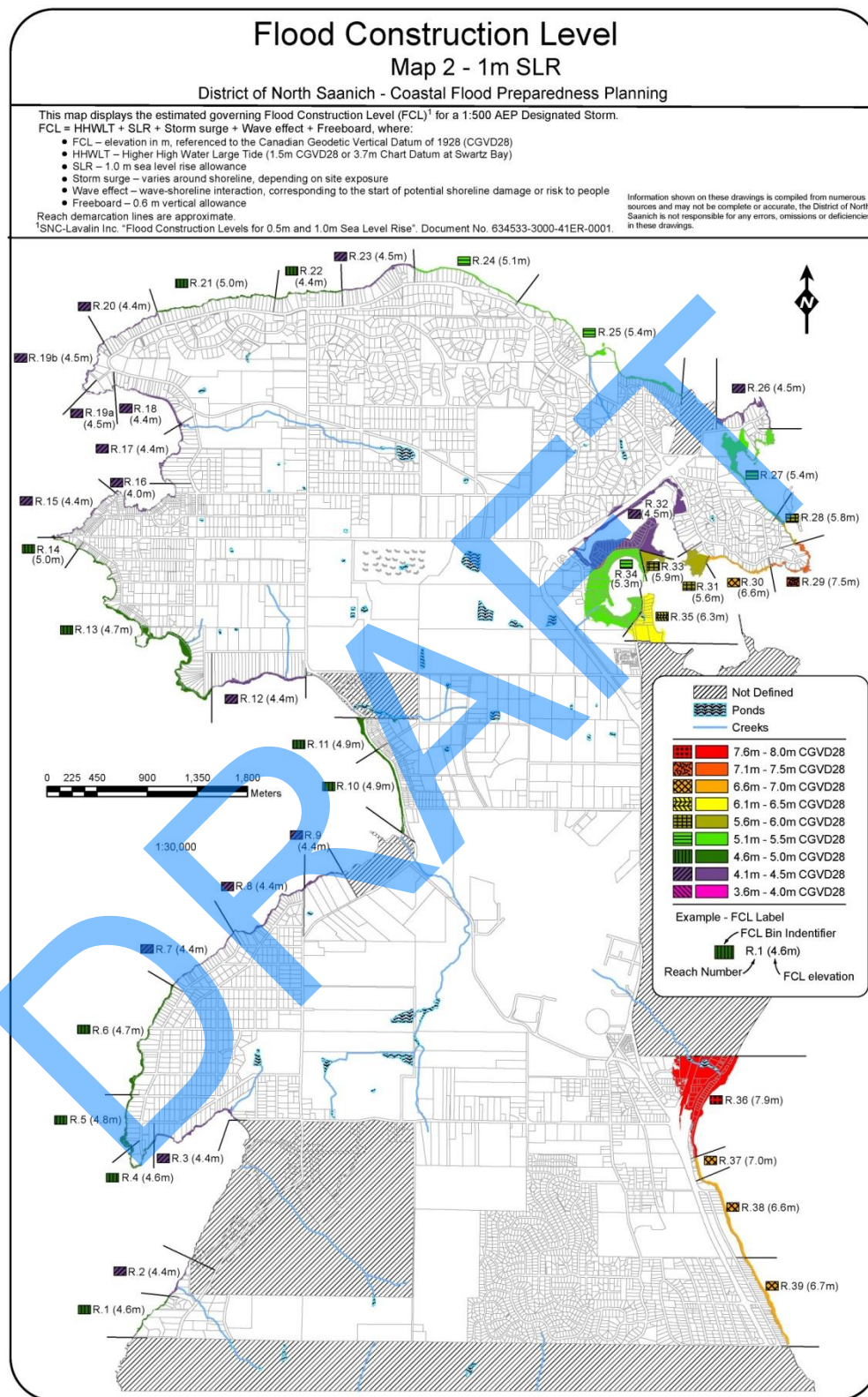


Figure 2: DPA 9 Map 2

6 GLOSSARY

Abbreviations, acronyms and definitions of terms used in this report are listed below.

6.1 Abbreviations and Acronyms

| | | |
|-----------|---|--|
| AEP | Annual Exceedance Probability | The probability (or % chance) of a specific event occurring or being exceeded in any given year. |
| CD | Chart Datum | In the DNS area, CD is 2.2m (± 0.1 m) below Geodetic Datum (CGVD28). |
| CGVD28 | Canadian Geodetic Vertical Datum (1928) | <p>In most places in Canada, this is the current reference datum for terrestrial vertical elevations and is generally the same as mean sea level, based on astronomical tides alone. A detailed description is available online at:</p> <p>http://www.nrcan.gc.ca/earth-sciences/geomatics/geodetic-reference-systems/9054#_Canadian_Geodetic_Vertical_1.</p> <p>CGVD28 is being replaced with a newer datum plane based on a North American common geoid. The new datum is notionally equivalent to the local coastal mean sea level. Details are available online at:</p> <p>http://www.nrcan.gc.ca/earth-sciences/geomatics/geodetic-reference-systems/9054#_Benchmarks_Information</p> |
| CRD | Capital Regional District | |
| DFL | Designated Flood Level | A water surface elevation which includes appropriate allowances for future SLR, land crustal movement, tide, and storm surge during the Designated storm. |
| DPA | Development Permit Area | Refers to Development Permits as per Division 7 of the LGA or Section 14 of the OCP. |
| DS | Designated Storm | A storm which includes concurrent time series of winds, storm surge and waves, with a specific AEP. |
| FCL | Flood Construction Level | Defined as the underside elevation of a wooden floor system or the top elevation of a concrete slab, for habitable buildings [1]. |
| FCL Study | | SNC Lavalin Inc's report "Flood Construction Levels for 0.5 and 1.0 m Sea Level Rise", SLI Document: 634533-3000-41ER-0001 [13]. |

| | | |
|--------|--------------------------------------|--|
| HHWLT | Higher High Water Large Tide | The average of the annual highest tide over an 18.6 year complete tidal cycle. In the DNS area, HHWLT is 1.5 m above Geodetic Datum (CGVD28) and 3.7 m above Chart Datum (± 0.2 m). |
| LGA | Local Government Act | Refers to the updated <i>Local Government Act</i> (RSBC 2015), which was made current as of October 26, 2016.[11] |
| NSCCAP | North Saanich Climate Action Plan | Refers to Reference [14]. |
| MTF | Marine Task Force | Refers to the individuals responsible for the MTFR. |
| MTFR | Marine Task Force Report | Refers to Reference [10] |
| OCP | Official Community Plan | Depending on context refers to Official Community Plan Bylaw No. 1130, dated 23 May 2007 or its update [9]. |
| RGS | Regional Growth Strategy | Refers to Reference [8]. |
| RSBC | Revised Statutes of British Columbia | |
| SDA | Special Development Area | Refers to Special Development Area as per Section 13 of the OCP. |
| SLI | SNC Lavalin Inc | |
| SLR | Sea Level Rise | The rise in sea level including: global sea level rise driven by global warming and local sea level rise driven by regional tectonic or isostatic (glacial) subsidence or uplift. |
| SWAN | Simulating Waves Nearshore | Wave modelling software, which can simulate wave generation, propagation, dissipation and transformation to the shoreline. |
| °T | Degrees, True North | Direction in degrees, with respect to True North. |

6.2 Definitions

| | |
|----------------------------|---|
| 2011 Provincial Guidelines | Guidelines posted by BCMOE, BCMOE (2011a,b,c), and available online at: http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/draw_report.html#3 |
| Fetch | The horizontal distance over open water (in the direction of the wind) over which wind generates waves. |
| Freeboard | A vertical allowance added to the DFL and the Wave Effect allowance to establish the FCL. This allowance is generally included to cover any uncertainties in defining the FCL. |
| Geodetic Datum | The reference plane for terrestrial vertical elevations in Canada and in |

| | |
|----------------------|--|
| | general approximately equal to mean sea level. |
| Overtopping | The passage of water over the crest of a shoreline or shoreline structure as a result of wave run-up. |
| Residual Water Level | The component of the measured water level that is not attributed to tidal effects. The residual water level is generally assumed to be approximately equal to the storm surge. Calculated as the measured total water level minus the predicted tides at a given location. |
| Run-Up | The vertical distance travelled by the action of individual waves that break and travel up the shoreline or slope of a shoreline structure. |
| Storm Surge | The non-tidal rise/fall in a body of water due to atmospheric effects. |

7 REFERENCES

7.1 Reference Documents

- [1] BCMoE 2010. "Preparing for Climate Change: British Columbia's Adaptation Strategy". BC Ministry of Environment. February 2010.
- [2] BCMoE (2011a). "Climate Change Adaptation Guidelines for Sea Dikes and Coastal Flood Hazard Land Use: Draft Policy Discussion Paper". BC Ministry of Environment. 27 January 2011.
- [3] BCMoE (2011b). "Climate Change Adaptation Guidelines for Sea Dikes and Coastal Flood Hazard Land Use: Guidelines for Management of Coastal Flood Hazard Land Use". BC Ministry of Environment. 27 January 2011.
- [4] BCMoE (2011c). "Climate Change Adaptation Guidelines for Sea Dikes and Coastal Flood Hazard Land Use: Sea Dike Guidelines". BC Ministry of Environment. 27 January 2011.
- [5] BCMOE (2004). "Flood Hazard Land Use Management Guidelines". Available online at: http://www.env.gov.bc.ca/wsd/public_safety/flood/pdfs_word/guidelines-2011.pdf.
- [6] BCMoE (2016). "Amendment Section 3.5 and 3.6 - Flood Hazard Area Land Use Management Guidelines", 2 October 2017. Available online at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/integrated-flood-hazard-mgmt/final_amendment_to_s_35_and_36_fhalumg_17-10-01.pdf
- [7] SLI 2016a. "Flood Construction Level Study". Document No. 634533-1000-41ER-0001. Rev. 00. 2 May 2016.
- [8] CRD 2016. "Capital Regional District: Regional Growth Strategy". Draft (v.1.5). March 2016.
- [9] DNS 2007. "Official Community Plan Bylaw No. 1130. A bylaw to guide and direct decision-making on all aspects of planning and land use management within the District of North Saanich". 23 May 2007.
- [10] DNS 2008. "District of North Saanich: Marine Task Force Final Report". District of North Saanich. July 2008.
- [11] LGA 2015. "Local Government Act [RSBC 2015]". Copyright Queen's Printer, Victoria, BC, Canada. Available on line at: [http://www.bclaws.ca/civix/document/LOC/lc/statreg/--%20L%20--/Local%20Government%20Act%20\[RSBC%202015\]%20c.%201/00_Act/r15001_00.htm](http://www.bclaws.ca/civix/document/LOC/lc/statreg/--%20L%20--/Local%20Government%20Act%20[RSBC%202015]%20c.%201/00_Act/r15001_00.htm)
- [12] SeaChange 2009. "Saanich Inlet and Peninsula Atlas of Shorelines (SIPAS)". Technical Report prepared by SeaChange Marine Conservation Society, Peninsula Streams Society and Saanich Inlet Protection Society. Available online at: <http://seagrassconservation.org/wp-content/uploads/2015/01/SIPAS-Technical-Report.pdf>
- [13] SLI 2016b. "Flood Construction Levels for 0.5 m and 1.0 m Sea Level Rise". Document No. 634533-3000-41ER-0001. Rev. PB. 22 September 2016.
- [14] SSGWWC 2007. "North Saanich Climate Action Plan". Sustainability Solutions Group Workers Cooperative 2007. Available online at: <https://sites.google.com/a/sustainabilitiesolutions.ca/north-saanich-project-pages/home>

NOTICE TO READERS

This document contains the expression of the professional opinion of SNC-Lavalin Inc. (“SLI”) as to the matters set out herein, using its professional judgment and reasonable care. It is to be read in the context of the Agreement, and the methodology, procedures and techniques used, SLI’s assumptions, and the circumstances and constraints under which its mandate was performed. This document is written solely for the purpose stated in the Agreement, and for the sole and exclusive benefit of the Client, whose remedies are limited to those set out in the Agreement. This document is meant to be read as a whole, and sections or parts thereof should thus not be read or relied upon out of context.

SLI has, in preparing any cost estimates, followed methodology and procedures, and exercised due care consistent with the intended level of accuracy, using its professional judgment and reasonable care, and is thus of the opinion that there is a high probability that actual costs will fall within the specified error margin. However, no warranty should be implied as to the accuracy of any estimates contained herein. Unless expressly stated otherwise, assumptions, data and information supplied by, or gathered from other sources (including the Client, other consultants, testing laboratories and equipment suppliers, etc.) upon which SLI’s opinion as set out herein is based has not been verified by SLI; SLI makes no representation as to its accuracy and disclaims all liability with respect thereto.

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REVISION INDEX AND SIGNATURES

| Issue Code | Rev. No | Date (yyyy-mm-dd) | Description of Changes | Initials |
|------------|---------|-------------------|---|----------|
| RR | PA | 2016-11-03 | Released for Internal Review | SL |
| RR | PB | 2016-12-12 | Released Client Information and Comment | JSR |
| RR | PC | 2016-12-20 | DPA 9 complete. Awaiting legal comments | JSR |
| RR | PD | 2016-12-22 | Legal comments incorporated | JSR |
| RR | PE | 2017-01-04 | DNS comments incorporated | JSR |
| RR | PF | 2017-01-05 | Additional DNS comments incorporated | SL |
| RR | PG | 2017-01-24 | COW comments incorporated | JSR |
| RR | PH | 2017-10-13 | Comments from Consultation incorporated | JSR |

Issue Codes:

| | |
|-----------|----------------------------------|
| RC | Released for Construction |
| RD | Released for Design |
| RF | Released for Fabrication |
| RI | Released for Information |
| RP | Released for Purchase |
| RQ | Released for Quotation |
| RR | Released for Review and Comments |

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