BYLAW NO. 2790.04

REGIONAL DISTRICT OF OKANAGAN-SIMILKAMEEN

BYLAW NO. 2790.04, 2022

A Bylaw to amend the Electoral Area "F"
Official Community Plan Bylaw No. 2790, 2018

The REGIONAL BOARD of the Regional District of Okanagan-Similkameen in open meeting assembled, ENACTS as follows:

1. This Bylaw may be cited for all purposes as the "Electoral Area "F" Official Community Plan Amendment Bylaw No. 2790.04, 2022."

2. The "Electoral Area "F" Official Community Plan (OCP) Bylaw No. 2790, 2018" is amended by:

   i) replacing Section 17.0 (Hazard Lands) in its entirety with the following:

17.0 HAZARD LANDS

17.1 Background

Hazard lands include but are not limited to areas the Regional District has reason to believe are subject to natural hazards including flooding, mud flows, debris torrents, erosion, rockfall, landslip, sink holes and wildfire.

The information available for the entire Regional District can be variable and may lack detail, so hazards often need to be investigated on a site-by-site basis. Recognizing this, site planning for proposed developments should consider the potential hazards on any given site. Some hazards can be evaluated and mitigated at the time of development. Other hazards, such as wildfire, can not only impact new developments, but also threaten existing structures.

Maps of key hazard areas in the Plan Area have been prepared and include Geotechnical Hazards (Schedule 'D'), Steep Slope Hazards (Schedule 'E'), Wildfire Hazards (Schedule 'F') and Floodplain Hazards (Schedule 'G').

17.2 Objectives

.1 Prevent injury and loss of life and to prevent or minimize property damage because of natural hazards.

.2 Ensure development does not occur in areas subject to known hazardous conditions, unless the hazard has been sufficiently addressed and mitigated.

.3 Recognize that important habitat may also be found in natural areas that are considered hazardous, and that disruption of these areas should be minimized.

.4 Minimize wildfire hazards to people and property in existing and proposed new development.

17.3 General Policies

The Regional Board:

.1 Will not support the rezoning of development on lands with natural hazards as identified by the Regional District or other agencies having jurisdiction, unless the applicant can provide a report by a Qualified Professional Engineer or Geoscientist that the land can be safely used for the use intended.

.2 Encourages annual inspections, and as-needed inspections after large storms, runoff or flooding events, at the highest risk areas for impacts, such as steep slopes and major culverts outfalls.

.3 Encourage the provincial Approving Officer to ensure that technical reports for hazard lands are prepared by appropriately qualified individuals and that any recommended conditions for safe use of the land area are registered as s. 219 covenants to inform future property owners.

17.4 Geotechnical Hazard Management

Geohazard issues in the Greater West Bench (GWB) area date back to 1913 when a landslide occurred during construction of the Summerland to Penticton Lakeshore Road, killing three workers. In 1958, a large sinkhole appeared in the area and, as a result, investigation and mapping of the glaciolacustrine soils was completed, leading to early recommendations regarding land use activities to reduce the likelihood of accelerated erosion.

Detailed geohazard mapping was completed for a portion of the GWB area by the consulting firm Klohn Leonoff in 1992. Klohn Leonoff's map work identified potential areas affected by landslide, sinkhole, and silt bluff hazards,

and was relied upon by the Regional District for many years to direct land development away from hazardous areas.

A 2006 update stated that the conclusions and recommendations of the 1992 report "appear to be valid today" as "the silt bluffs and West Bench/Sage Mesa are still subject to the risk of landslides and subsurface erosion."

In 2021, an updated technical assessment of geotechnical hazards in the GWB area was completed. This report built on the Klohn Leonoff Report (1992) and comprised an assessment of geotechnical conditions utilizing historical and recent data, and applied modern technology and methods. The results indicate that:

- landslide hazards persist within the vicinity of the steep silt bluff slopes that occur along the eastern boundary of the GWB area;
- landslide hazards are greatest within approximately 50 metres of the slope crest and extend beyond the toe of the slope towards Highway 97 and Okanagan Lake;
- sinkhole hazards within the GWB area are highest within 30 metres to 50 metres of the silt bluff or gully slope crest and are observed exclusively within the Glaciolacustrine Silts; and
- sinkhole hazards predominately occur over the eastern and northern half of the West Bench area.

In addition, the geotechnical hazard zones now included at Schedule 'D' (Hazard Lands – Soil) are more refined than the original Klohn Leonoff (1992) mapping of landslide and sinkhole hazards.

The 2021 Update included a further series of suggestions in relation to identified Data Gaps that could be pursued based on need and available funding. This included:

- conduct additional subsurface soils investigation in conjunction with future geotechnical studies;
- conduct additional groundwater investigation and monitoring;
- update the 1994 Wastewater Management Plan; and
- improve stormwater management practices.

More generally, changes in the amount and timing of precipitation due to climate change could also impact the nature and severity of geotechnical hazards. Earlier and higher peak freshet flows in spring, dryer summers, changes in local vegetation, and more freeze-thaw cycles can all cause increased risk of erosion, landslide, and wildfires. That being said, no major changes to stability conditions due to climate change are projected in the West Bench/Sage Mesa area (Associated Environmental, 2017).

North Beach Estates:

A geological hazard analysis was completed for the North Beach Estates area (Golder 2009) as part of rezoning and permitting of the North Beach Estates lands and community when Highway 97 was being redesigned and reconstructed. The houses here were found to be within potential landslide runout zones, and it was recommended (Golder 2009) that: water discharges such as irrigation, and placement of fill, should not occur on the benches above the steep slopes and the houses; natural vegetation should be maintained; and that risk reduction measures should be developed.

Shingle, Trout and Farleigh Creeks:

Terrain stability maps and reports were completed for the western (mainly provincial land) part of the Electoral Area, in the Shingle Creek, Trout Creek, and Farleigh Creek community watersheds, for forest development and erosion mitigation purposes (AGRA 1999; Maynard 2001; Dobson et al 2004). These reports show that these areas are not generally suitable for specific residential land development, that rockfall and rock slides and gully erosion are common in the upland hills and valleys, and that local flooding of the narrow valley bottoms is also common, especially during wet years such as 2017.

17.4.1 Policies

The Regional Board:

.1 Supports periodic reviews of geohazard conditions within the Greater West Bench Area every 10-20 years in order to detect and adapt to geotechnical changes such as landslides, sinkhole development or other incidences.

.2 Supports the development of a web-based reporting tool to record geohazard events in the Greater West Bench area.

.3 Supports restricting densities in the Greater West Bench area due to geotechnical hazards by prohibiting accessory dwellings, secondary suites and the subdivision of land.

.4 Supports amending the zoning bylaw to prohibit the development of swimming pools in the West Bench/Sage Mesa area due to geotechnical hazards.

.5 Supports the development of reporting requirements for geotechnical studies submitted in support of new development applications to the Regional District.

.6 Supports the preparation of a Soil Removal and Deposition Bylaw to regulate, monitor, and limit the removal and deposition of soil in the Greater West Bench Area.

.7 Encourages monitoring of surface and groundwater conditions at West Bench - Sage Mesa including potential water system leakage.

.8 Encourages the development of a sanitary sewer and/or stormwater management system in Greater West Bench to alleviate the risk of geotechnical failure due to usage of existing onsite septic systems.

.9 Supports educating home owners living on and near hazard lands regarding water use and drainage practices necessary to minimize triggering geological hazards, and the importance of immediate reporting to RDOS if erosion or land problems start to occur.

.10 Encourages a program to monitor the land surveys for roads, curbs and culverts to determine if any subsidence or lateral movement is occurring, which could identify sites where subsurface erosion is occurring due to misdirected water.

.11 Will direct development away from lands identified as being susceptible to soil instability and potentially hazardous geotechnical conditions.

.12 Discourages development on slopes with grades in excess of 30% to avoid geotechnical hazards.

.13 Will recommend that the Approving Officer require a geotechnical report indicating the land can be safely used for the use intended for a subdivision where the new development is located on slopes greater than 30%, including those areas that may be regraded to slopes less than 30% after development, in order to address potential soil instability, hazardous conditions and environmental sensitivity.

17.5 Flood Hazard Management

The Regional District has a long history, through the Electoral Area zoning bylaws, of regulating development within flood prone areas.

In 2003, *Flood Hazard Statutes Amendment Act* was adopted and shifted responsibilities for flood hazard management by removing the province from the subdivision and bylaw approval process. After this date, land use decisions in flood prone areas became the responsibility of local governments and, in regional districts, the provincially appointed subdivision Approving Officer.

When regulating development through the zoning bylaws, the Regional District has historically relied on floodplain mapping prepared by the British Columbia

Inventory and Engineering Branch, Floodplain Mapping Program, in the 1980s and 1990s.

Record-setting high flows and flooding in the Okanagan Valley in 2017, followed by high flows in 2018, prompted the Okanagan Basin Water Board (OBWB), the Okanagan regional districts, member municipalities and the Okanagan Nation Alliance and member communities to update floodplain mapping for the Okanagan River and its lakes.

This project was undertaken with two main objectives: comprehensive floodplain mapping for the Okanagan River mainstem lakes and Okanagan River from Penticton to Osoyoos Lake, and improving the understanding of flood management options available to water managers and operators in the face of climate variability and change.

The flood hazards now included at Schedule 'G' (Hazard Lands – Floodplain) are based on the mapping prepared by the OBWB in 2020.

17.5.1 Policies

The Regional Board:

.1 Discourages development of land susceptible to flooding and encourages those lands to be used for parks, open space, habitat conservation, recreation or agricultural uses.

.2 Requires that where land subject to flooding is to be developed and no alternative land is available, construction and siting of buildings and manufactured homes to be used for habitation, business, industry, or the storage of goods damageable by floodwaters shall comply with the floodplain regulation of the Zoning Bylaw with any relaxation subject to the recommendations of a report prepared by a qualified Professional Engineer or Geoscientist, where applicable.

.3 Supports minimizing exposure to future flood damage by avoiding development adjacent to Okanagan Lake or by implementing flood mitigation measures.

.4 Supports mitigating the impacts of potential flooding on buildings and properties in the floodplain area and affected by groundwater through design and site grading prior to construction as per the recommendations of a report prepared by a qualified Professional Engineer or Geoscientist.

.5 Encourages the Okanagan Basin Water Board (OBWB) to prepare model floodplain regulations to support the Okanagan Mainstem Floodplain Mapping (2020), so that both the mapping and regulations can be incorporated into the electoral area zoning bylaw(s).

17.6 Wildfire Hazard Mitigation

A *Community Wildfire Protection Plan* (CWPP) was completed for the Regional District in 2011. The plan assessed wildfire risk across the region and made recommendations to improve the community's risk profile through pre-planning and preparedness, policy, and fuel management.

As a predominantly rural area, the CWPP determined that development in the Plan Area generally consists of:

- low to moderately dense rural intermix areas (>1structure/ha) with more forested areas between structures and a less defined perimeter;
- a well-defined urban/interface complex where the interface perimeter is more clearly defined; and
- individual structures remotely scattered within the wildlands.

See Schedule 'F' (Hazard Lands – Wildfire) for a map of wildfire hazard areas in the Plan Area.

In the next few decades, climate change will likely have a significant change on fire hazard within Electoral Area "F" based on the decreases in precipitation and changes in forest fuel structure and composition (Associated Environmental, 2017).

17.6.1 Policies

The Regional Board:

.1 In reviewing a rezoning application submitted to the Regional District for development in those areas identified in the *Community Wildfire Protection Plan* (CWPP) and shown on Schedule 'F' (Hazard Lands – Wildfire), the Regional District may require a fire hazard risk assessment by a qualified professional with recommendations concerning but not limited to the following:

a) incorporating fuel breaks adjacent to, or on, residential subdivisions;

b) establishing zones around proposed building sites which are clear of debris and highly combustible materials;

c) utilizing fireproofing techniques and fireproof materials in building design;

d) designing roads that provide evacuation routes and facilitate movement of firefighting equipment;

e) ensuring all roads are named and signed;

f) ensuring availability of water supply facilities adequate for fire suppression;

g) ensuring the provision of access to local water sources, lakes and watercourses as part of access requirements; and

h) implementing setbacks, interface fire protection standards, building material standards, and vegetation pursuant to Provincial FireSmart guidelines.

.2 Using the FireSmart guide as a principal guidance document, strives to foster wildfire awareness and resiliency through public education materials, programs and events.

.3 Strongly encourages that all new developments with moderate or higher fire hazard ratings to incorporate best practice interface forest fire mitigation techniques for buildings and landscaping.

.4 Should review and update wildfire protection approaches as often as necessary based on changing community circumstances, climate change driven ecosystem conditions, and mitigation techniques.

.5 Encourages property owners to adhere to the relevant Provincial guidelines to protect properties and communities from wildfire risk through such measures as reducing fuel loads and regular maintenance of eaves. Such measures should be supportive of the natural environment and mimic the natural effects of localized ground fire such as thinning and spacing trees and vegetation, removal of debris and dead material from the ground, and removal of lower tree branches.

.6 Supports pursuing provincial funding and resources to undertake wildfire risk reduction in the community/forest interface areas.

.7 Supports the development of an inventory of accessible water sources by the province that could be enhanced to support water extraction by firefighting equipment.

17.7 Radon Gas Hazard Mitigation

Radon is a radioactive gas that occurs naturally when the uranium in soil and rock breaks down. It is invisible, odourless and tasteless. When radon is released from the ground into the outdoor air, it is diluted and is not a concern. However, in enclosed spaces like homes, it can accumulate to high levels.

The Plan Area and larger region has been recognized for radon issues. Radon gas is a recognized health hazard and the Province has established regulations in the BC Building Code for new construction to vent radon that may seep into

homes.

17.7.1 Policies

The Regional Board:

.1 Encourages provincial and/or federal agencies to conduct further research on possible radon health risks in and around the Plan Area.

.2 Encourages Plan Area residents to test their homes for radon exposure and to take appropriate mitigation measures where radon levels are found to be higher than recommended levels.

.3 Supports providing information on radon and radon mitigation opportunities to Plan Area residents.

ii) replacing Schedule 'D' (Hazard Lands – Soil Map) with a new Schedule 'D' (Hazard Lands – Soil Map), as shown on the attached Schedule 'A' (which forms part of this bylaw).

iii) adding a new Schedule 'G' (Hazard Lands – Floodplain Map) as shown on the attached Schedule 'B' (which forms part of this bylaw) and renumbering all subsequent Schedules and bylaw references to these Schedules accordingly.

READ A FIRST AND SECOND TIME this _____ day of _____, 2022.

PUBLIC HEARING held on this _____ day of _____, 2022.

READ A THIRD TIME this _____ day of _____, 2022.

ADOPTED this this _____ day of _____, 2022.

_____ _____

Board Chair Corporate Officer

Schedule 'A'

Electoral Area "F" Official Community Plan (OCP) Bylaw No. 2790, 2018

Schedule 'D' (Hazard Lands – Soil Map)

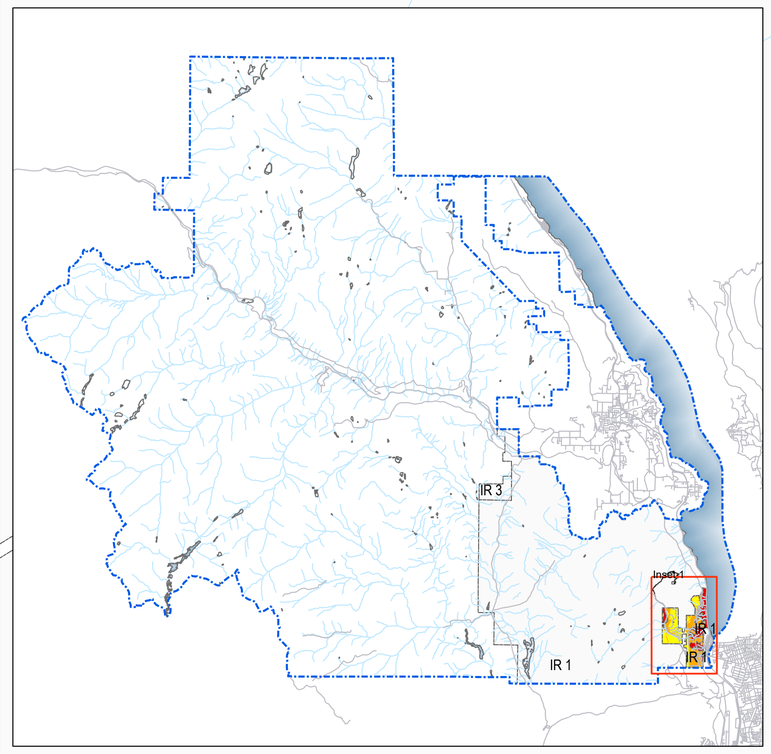
[SEE NEXT PAGE]

Hazard Lands
Hazard Lands – Geotechnical

Schedule ‘D’ - (Hazard Lands – Geotechnical)
Official Community Plan Bylaw No. 2790, 2018.

REGIONAL DISTRICT
RDOS
OKANAGAN·SIMILKAMEEN

0 2.5 5 10 15 20
Kilometers



IR 1

This is Schedule ‘D’ - (Hazard Lands – Geotechnical) as referenced in the Regional District of Okanagan-Similkameen's Electoral Area "F" Official Community Plan Bylaw No. 2790, 2018

Chair

Chief Administrative Officer

Legend

Constraint Zone

- A - Low
- B - Moderate
- C - High

IR 1

IR 1

1:5,000

Date: 2022-03-03

Regional District of Okanagan-Similkameen
101 Martin St, Penticton, BC, V2A-5J9
Tel: 250-492-0237 Email: info@rdos.bc.ca

Schedule 'B'

Electoral Area "F" Official Community Plan (OCP) Bylaw No. 2790, 2018

Schedule 'G' (Hazard Lands – Floodplain Map)

[SEE NEXT PAGE]

HAZARD LANDS FLOODING

Schedule ‘G’ - (Hazard Lands – Flooding)
Official Community Plan Bylaw No. 2790, 2018.

REGIONAL DISTRICT
RDOS
OKANAGAN-SIMILKAMEEN

0 0.47 0.95 1.9 2.85 3.8 Kilometers

This is Schedule ‘G’ (Hazard Lands - Flooding) as referenced in the Regional District of Okanagan-Similkameen's Electoral Area “F” Official Community Plan Bylaw No. 2790, 2018

Chair

Chief Administrative Officer

Electoral Boundary

Flood Hazard Area *

NOTES:
1. The flood hazard area* indicated on this map shows the extents of the ‘Lake Shoreline Flood Construction Zone’ and the ‘River Flood Construction Level Zone’ in the OBWB’s ‘Okanagan Mainstem Floodplain Mapping Project Report’ (NHC, 2020)
2. Okanagan Flood Modeling Data as shown was created in April 2020 by NHC for the Okanagan Basin Water Board. See the ‘Okanagan Mainstem Floodplain Mapping’ report (31 March 2020)
3. The design flood event is ‘200-YEAR MID-CENTURY’ and varies by lake. Flood extents data considers mid-century climate change impacts and may include wind setup, wave effects, and freeboard (0.6m).
4. The accuracy of simulated flood levels is limited by the reliability and extent of water level, flow, and climatic data. The accuracy of the floodplain extents is limited by the accuracy of the design flood flow, the hydraulic model, and the digital surface representation of local topography. Localized areas above or below the mapped inundation maybe generalized. Therefore, floodplain maps should be considered an administrative tool that indicates flood elevations and floodplain boundaries for a designated flood. A qualified professional is to be consulted for site-specific engineering analysis.

IR 3

IR 1

IR 1

IR 1

IR2

Esri, NASA, NGA, USGS, FEMA

Date: 2022/03/03