



REPORT TO COUNCIL

To: **Mayor and Councillors**

Subject: **Amendments to Floodplain Elevation Bylaw
No.2768**

File #: [Required]

Doc #:

From: Hirod Gill, P.Eng.
Manager of Engineering Services

Date: April 17, 2023

RECOMMENDATION:

THAT the report from the Manager of Engineering Services dated April 17, 2023 regarding amendments to Floodplain Elevation Bylaw, No. 2768 be received for information

PURPOSE:

The purpose of the report is to provide a summary of the recently completed “Nicomekl Floodplain Mapping study”; and background information related to proposed amendments to City of Langley Flood Elevation Bylaw.

Bylaw:

Floodplain Elevation Bylaw No.2768

COMMENTS/ANALYSIS:

The City of Langley adopted a Floodplain Elevation Bylaw (Bylaw#2768) on June 7, 2010. Pursuant to Section 524 of the Local Government Act, this bylaw sets a minimum acceptable Flood Construction Level (FCL) for all habitable constructions within Nicomekl River, Murray Creek, and Logan Creek floodplain boundaries to reduce the exposure to risk for new development and alleviate potential damages due to flooding.

The current and anticipated impacts of climate change will affect the City in many ways. To address increasing flood risk, buildings built today should be designed for

flood resilience throughout their lifespan. For this reason, the City retained a consultant in 2022 to complete a Nicomekl Floodplain Mapping study to assess flood potential under a 200-year return period storm event and the Metro Vancouver's "year 2100 moderate climate change" scenario. The adoption of the 'moderate' precipitation increase provides a reasonable scenario to support flood assessment and mitigation planning for the City of Langley.

The hydraulic model (computer simulation) used in this study also included the observed data collected during November 15, 2021 flood event that caused widespread flooding across southwest BC. The final report associated with this study has been uploaded on the City's website for consulting engineers, developers, and public at large who might be interested in more details on the study's methodology and findings.

The proposed bylaw amendments update the Flood Construction Levels within the Nicomekl River flood plain and other tributary creeks to respond to the increased risk of flood damages due to climate change.

Developing New Flood Construction Levels

The study updated floodplain maps for the Nicomekl River, Murray Creek, Logan Creek, and Jeffries Brook and include flood construction level (FCL) contour lines. These FCLs are based on the output from a hydraulic model for the 200-year return period flood event, plus a 0.6 m freeboard allowance. Freeboard is an added elevation as a safety factor and to account for uncertainties in future predictions.

Flooding along small tributaries (Baldi Creek, Brydon Creek, Pleasantdale Creek, Muckle Creek and Langley Creek) was not modelled as they are quite small, and act more as extensions of the storm drainage network than as channels with floodplains. For development adjacent to these tributaries, the FCL will be 1.8 m above the "Natural Boundary"¹ of the creek, which includes the 1.5m requirement per the 2018 Provincial "Flood Hazard Area Land Use Management Guidelines" for 'smaller streams', plus 0.3m to account for climate change effect.

Comparison of the Existing and the proposed FCLs

The study showed that the maximum water levels range from 0.4m to 1.08m increase within the Nicomekl River floodplain and tributaries.

Examples of locations where FCL increases occur are as follows:

¹ Natural Boundary is defined 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 and includes the edge of dormant side channels of any lake, river, stream, or other body of water

- On the Nicomekl River, the median FCL increase is 0.50 m; the increase upstream of 208 Street, is approximately 0.40 m, while at 196 Street alignment the increases are up to approximately 0.93 m.
- On Logan Creek, the median FCL increase is 0.38 m; but is strongly influenced locally by culvert crossings (i.e., at Glover Road, railway crossing, Maple leaf at 20380 Langley Bypass, and Langley bypass at 202 Street), which cause a maximum increase of 1.08 m

These results provide a general understanding of the increases to maximum water levels that may be expected under future land use and climate change. The new FCLs requirements, if approved, will be applied to new development within the City.

Flood Mitigation by Dredging the Nicomekl River

A question was raised by the previous Council on whether dredging Nicomekl River would alleviate flooding. The 2022 Nicomekl Floodplain Mapping study suggests that dredging may provide some capacity benefit in selected areas; however, the effect of dredging is minimal in reducing the flood level. The study showed a 1.0 m dredge at upstream of the 203 Street bridge will only reduce the flood level by 16 cm. Also, the channel will continue to silt up over time so the benefits of dredging cannot be depended on for permanent flood control level mitigation.

Dredging class-A and Class-B creeks/rivers requires an extensive permitting process, Environmental considerations (birds nesting, fish habitats, etc.), public/First Nations consultations, and a narrow time window to finish the project to minimize the disturbance to fish and other aquatic lives.

Given the challenges noted above, staff do not recommend dredging at this time.

BUDGET IMPLICATIONS:

None.

The proposed updates in the bylaw may increase development construction costs by requiring an increase to the required Minimum Building Elevation (MBE) to safeguard the City residents and the buildings from the rising flooding levels due to climate change.

ALTERNATIVES:

N/A

Respectfully Submitted,



Hirod Gill, P.Eng.
Manager of Engineering Services

Reviewed by,



Rick Bomhof, P.Eng.
Director of Engineering, Parks & Environment

CHIEF ADMINISTRATIVE OFFICER'S COMMENTS:

I support the recommendation.



Francis Cheung, P. Eng.
Chief Administrative Officer