

ATTACHMENT 1
RIVERINE FLOOD HAZARD MAPPING STUDY HIGHLIGHTS
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Englishman River

The Englishman River system located is located southwest of the City of Parksville and flows easterly from its headwaters on Mount Arrowsmith and discharges into the Strait of Georgia, north of Craig Bay. The river floodplain narrows at Highway 19A before it transitions into a coastal delta of ecological and recreational importance known as the Englishman River Estuary. The study findings are summarized as follows:

- Low-lying areas experience periodic flood events, such as Martindale Road and San Pareil on an annual and semi-annual basis.
- Extreme rainfall analysis provides a future peak with a +25% climate change factor. This factor is used in the calculation of future peak flow estimates.
- The 200-year return period present day peak flow discharge is 782 m³/s; translates to a 200-year peak flow of 978 m³/s under climate conditions.
- Flood extent comparison to present maps; little change to the flood extent attributed to the bowl-shaped river channel underlain by bedrock formation.
- Flood depth comparison to present maps; low lying areas most effected present-day and future, such as Plummer Road, Martindale Road and San Pareil.
- The river channel position has remained fairly stationary over the past 70 years. The existing 30 meter buffer is deemed adequate; no changes to the existing land use setback regulations are recommended at this time.
- 10-year return period under present-day conditions, flooding is mostly contained within undeveloped areas near the river channel. Flooding is expected to reach a small cluster of homes in Martindale (near Shelly Creek) south of Highway 19A, and in San Pareil along Forgotten Drive and the Mistaken Place cul-de-sac.
- 200-year return period flood under present day conditions is expected to cause a larger amount of residential flooding in the San Pareil neighbourhood.
- Transportation disruptions is already significant under present-day flood scenarios and is expected to increase under future climate change conditions. Plummer Road and Martindale Road are vulnerable to flooding.
- Annualized loss values suggest that, on average, 106 people could expect to be impacted by flooding each year under present-day conditions, increasing to 343 people under future climate change conditions.
- Annualized loss values suggest on average 75 buildings could expect to be impacted by flooding each year under present-day conditions, estimated increase to 215 buildings under future climate change conditions.
- The San Pareil drinking water system intake is relatively resilient to a 10-year event under present conditions. The pump house requires flood management measure to avoid service delays during more extreme 200-year events under present and future conditions.

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Little Qualicum River

The Little Qualicum River system is located southwest of the Town of Qualicum Beach, beginning at Labour Day Lake near Mount Arrowsmith and flows northwest towards Cameron Lake and then northeast into to the Strait of Georgia. The floodplain widens around the location of the Little Qualicum Hatchery then narrows due to a natural bedrock formation and transitions into a coastal delta, forming the Little Qualicum River Estuary Regional Conservation Area. The hatchery is located on the right bank of the Little Qualicum River floodplain and is protected by a 1.8 km long, non-standard berm. A summary of the study findings follows:

- Low lying areas are currently exposed to flooding along Water Road Kinkade Road and Flamingo Drive. Some properties along Surfside Drive and McFeely Drive are impacted during extreme flood events.
- Extreme rainfall analysis provides a future peak flow with a +31% climate change factor. This factor is captured in the calculated future peak flow estimates.
- The present 200-year return period flood event for the Little Qualicum River was estimated to be 329 m³/s. The future 200-year flood event accounts for a +31% climate change factor for a 2070 – 2099 time horizon under the RCP 8.5 emission scenario has a flow estimate of 431 m³/s. This is 22% greater than the value used in the existing 1997 regulatory floodplain study.
- Flood extent comparison to present maps; the channel position has remained fairly stationary with small areas of change. Concludes the existing 30 m buffer remains sufficient for land use planning purposes.
- Flood depth comparison to present maps; low lying areas impacted now will experience future impacts overtime, especially areas influenced by riverine and coastal systems.
- The results show during the 10-year return period event under present-day conditions, flooding is expected to reach a cluster of homes along Flamingo Drive, Kinkade Road, Waters Road, and some of the buildings in the Cedar Grove RV Park & Campground and the Riverside Resort Qualicum Beach.
- A 200-year return period flood under present-day conditions is expected to cause a larger amount of residential flooding along Flamingo Drive, Kinkade Road, Surfside Drive and the Riverside Resort. The Hatchery berm is lightly to experience overtopping where the parking lot is located.
- Transportation disruption, present-day and future, are significant for Kinkade Road, Flamingo Road, Waters Road, and Riverbend Road. Highway 19A is likely impacted under extreme conditions. The E & N Railway is not at risk under present or future high-water levels.
- Annualized loss results suggest an estimated 58 people could be impacted by flooding each year under present-day conditions, increasing to 227 people under future climate change conditions.
- The RDN's Surfside Groundwater Wells are vulnerable to sea level rise. The RDN's Kinkade Road Pump Station is susceptible to future climate conditions, 10-year and 200-year return periods.