MOUNT CURRIE LANDSLIDE RISK ASSESSMENT (2018) RESULTS
Frequently Asked Questions (FAQs)

What area of Mount Currie was studied in the 2018 risk assessment?
The study area included a broad stretch of the north face of Mount Currie, from the ridge to the base and including areas at the base where historical rock avalanche deposits would have settled.

Why was the Mount Currie Landslide Risk Assessment completed?
An increase in small rockfall events was observed by community members and field staff from the Ministry of Forests Lands and Natural Resource Operations and Rural Development (MFLNRORD) over the summers of 2015 and 2016, raising concerns about slope stability. Community concern in conjunction with a written recommendation of further study by MFLNRORD geotechnical engineers prompted the SLRD to approach the provincial government for funding this study.

What were the findings of the 2018 Risk Assessment?
According to the BGC analysis, up to nineteen potential rock avalanche source zones exist, with four being identified as having high hazard potential. Two of those four zones, known as Scenario 1 and 2, were identified as having the potential for rock avalanches large enough to travel north of the Green and/or Lillooet Rivers. In these two scenarios, the rockfalls are expected to travel over 100km/hr and involve volumes up to approximately 8 million cubic metres of material.

How likely are these large rock avalanches to occur?
Geoscientists have calculated that the annual probability of the modeled rock avalanche of Scenario 1 is approximately a 0.02% chance of occurrence in any given year, while the annual probability of the modeled rock avalanche of Scenario 2 is approximately a 0.009% chance of occurrence in any given year, under current conditions and current weathering and erosion rates. For comparison, the probability is similar to the estimated probability of large debris flows from Mount Meager.

How many properties are directly impacted by the largest predicted rock avalanche events (Scenario 1 and 2)?
15 properties in the study area are assessed as being at direct risk from the rock avalanche direct impact and splash zone of these events, including private property and infrastructure such as the Pemberton Regional Airport and Wastewater Treatment Plant. The splash zone is the mud and debris field caused by saturated soils from the valley bottom being displaced by the rock avalanche.

How many properties are impacted by flood risk from the largest predicted rock avalanche events (Scenario 1 and 2)?
160 buildings were assessed as having higher vulnerability (flow depths greater than1 m above the estimated first floor elevation) from the associating flooding predicted from a rock avalanche that would block all or part of the Green and Lillooet Rivers. The depth, spread and rapidity of flooding is dependent on many variables of the rock avalanche event. However, it is important to note that these properties are already classified as being in a floodplain so flooding is an existing risk for these properties.

What were the recommendations of the 2018 Risk Assessment?

1. Further study in conjunction with the implementation of monitoring systems.
2. Develop more detailed digital records at a building level to better assess both population and economic vulnerability.
3. Integrate the results from this landslide risk assessment in a total risk framework (i.e., integrate with other geohazards such as floods) and their consequences.
4. Consider restricting land use in parts or all of the areas within modeled rock avalanche runout zones.

Will climate change increase the risk of large rock avalanches?

The stability of Mount Currie is believed to be influenced, in part, by the assumed existence of permafrost. In geology, permafrost is ground, including rock or soil, at or below the freezing point of water 0 °C for two or more years. Most permafrost is located in high latitudes, but at lower latitudes alpine permafrost occurs at higher elevations. With climate change, the report concludes that permafrost will degrade and the ice presumed to be present will melt. This would imply a higher frequency and possibly higher magnitude of rock slope failures in the future. Further study is needed to properly assess the presence and extent of permafrost and monitoring of changes over time would be required to accurately track potential increases in risk.

Who is the consultant who conducted the 2018 Risk Assessment?

BGC Engineering Inc. (BGC) is an international consulting firm that provides professional services in applied earth sciences. BGC's practice was established in 1990, based on a specialized appreciation of the impacts of geology on engineered structures. This continues to be BGC's foundation today, enabling BGC to address a broad spectrum of engineering and environmental issues related to development in challenging terrain. More information at www.bgcengineering.ca

What should impacted property owners do?

Property owners should review the information provided by their local government and the 2018 risk assessment report in its entirety. They should attend the Community Information Meetings on January 24th and 25th, 2018.

What are the SLRD, Lil'wat Nation and Village of Pemberton doing about this matter?

The first step is to provide the best available information to the affected property owners as soon as possible and to personally follow up with each of the 15 property owners to initiate communications. The local governments will then host community information sessions on January 24 and 25 with the geotechnical consultant to present the information, answer questions and discuss next steps as far as they are known at this time.

What steps are being taken to mitigate the risk in the area? Could a berm or dike structure be built to contain the rockfalls as has been done in Whistler to mitigate the Fitzsimmons Creek debris flow risk?

Due to Mount Currie's size and the number of source zones for rock avalanches, the Assessment states that engineered mitigation options such as berms or dikes are not practical. As a result, BGC has recommended monitoring as the most practical and cost-effective approach to risk management. The Assessment also recommends that land use be restricted in part or all of the areas modeled for rock avalanches, as any increase in development density would increase the population at risk.

Does this report mean that the 15 properties identified in the report are not safe to inhabit?

The Assessment has not made a recommendation to vacate the properties identified.

The recommendation to restrict land use seems overly cautious. Is the risk being exaggerated?

The Province and three local government jurisdictions have relied on the advice of professional Geoscientists and Geo-technical engineers experienced in slope stability to provide us with advice on the nature and degree of risk and will seek to find a reasonable balance between life safety concerns, economic impact and stress that news such as this will cause to affected residents.

I'm confused about the risk. Should I be packing my bags or going about life as normal?

Everyone makes their own decision as to what level of risk they are comfortable with.

The risk is still the same as yesterday, but we now understand it better.

If your property falls within the impact zone predicted for Scenario 1 and/or Scenario 2, all current generally accepted international risk standards indicate the risk to you, and your property, is well within the acceptable range for existing structures. However, current risks could change over time.

How does the large-scale events compare to the Hope and Meager Landslides?

The 1965 Hope Slide and the 2012 Mount Meager Landslide were both approximately 48 million cubic metres each. The volume estimates for Scenario 1 or 2 are 4 and 12 million cubic metres respectively.

Are there similar communities in Canada that have this same risk? Are there case studies?

Yes, an example is Turtle Mountain in Alberta which was the site of the 1903 Frank Slide. A section of the mountain next to the Frank Slide is considered unstable with the potential of generating a rock avalanche. The unstable section of the mountain has been monitored using different techniques and at various level of intensity for over 30 years. Land use zoning has also been adjusted to include the understanding of the hazard. The area of slope instability is currently being monitored by the Alberta Energy Board who prepares a yearly monitoring summary.

Are the smaller observed debris flows related to the possible larger-scale events?

Yes, to some degree. The recently observed rock slope instability on the north face of Mount Currie has created much more erodible sediment in upstream gullies which has transformed into debris flows during rain storms. These have pushed out the north-western fan beyond its historical limits.