

Community Emergency Plan

Upper Squamish Valley



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Key definitions

Emergency	An event that requires prompt coordination of actions to protect the health, safety or welfare of people, or to limit damage to property or the environment.
Hazard	A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
Resilience	Resilience is the capacity to adapt; by persevering, recuperating or changing to reach and maintain an acceptable level of functioning. Disaster resilience is built through empowering organizations, communities and society to share responsibility for keeping hazards from becoming disasters.
Risk	The combination of the likelihood and the consequence of a specified hazard event happening.
Vulnerability	Physical, social, economic and environmental factors or processes, that increase the susceptibility of a community to negative impacts from hazards. It is also a measure of how well prepared and equipped a community is to minimize impacts and cope with hazards.

Community Emergency Plan

Upper Squamish Valley 2017

Introduction

The SLRD Emergency Management Program provides emergency management services to the ~5,000 SLRD residents in the four Electoral Areas and partners closely with member municipalities. In addition to the Emergency Management Program, the SLRD funds and/or operates select Emergency Services in the region including:

- 9-1-1 Services
- Diking and drainage in Electoral Area D
- Fire and Rescue Services
- Wildfire Fuel Management Program.

Major emergencies and disasters are on the increase in Canada and worldwide. Disaster effects may be direct (e.g. damage to house, loss of income) or indirect (e.g. increased insurance premiums, reduced air quality due to smoke from wildfires elsewhere).

A number of communities in the SLRD are geographically isolated from traditional first responder organizations such as fire, police and emergency medical services. Communications and other infrastructure may be limited or prone to outages. The effect of this geographical separation is that communities will likely lead their own response, making community knowledge, preparation and skill building a vital aspect of emergency preparedness and increasing the resilience of these communities to adverse events.

The purpose of a Community Risk Assessment (CRA) is to guide practical steps in preparedness, response, recovery and mitigation that reduce both the likelihood of emergencies and the consequences when disaster cannot be avoided. Risk information also informs community residents, business owners, and institution managers of the hazards to expect and how best to prepare for them. Further, A CRA provides a platform from which to advance community-level emergency management and evacuation policy and planning.

A Community Action Plan (CAP) provides a blueprint for communities to increase their resilience through increasing skills, knowledge and connectedness – benefiting the community before a major emergency, during response and through the recovery process.

Community Overview

The Upper Squamish Valley (USV) is a rural residential farming and recreational property area located ~30 kilometers north of the District of Squamish, between the Tantalus Mountain Range and Cloudburst Mountain. It extends from the Squamish Nation reserve at past the one lane Pilchuk bridge to the beginning of the Tree farm (TFL 38) where the paved road becomes a gravel forest services road. The mile markers on the road are measured from Squamish downtown with Pilchuck Creek at mile 16 and the FSR (forest service road) starting at mile 22. Although it all looks like wilderness, almost all the land between these two points is privately owned. The USV has a strong sense of community and good community networks. The Ashlu Creek Foundation was formed in 2009 to “develop amenities for the social welfare, civic improvement, and the improvement of quality of life of the Upper Squamish Valley” (The Ashlu Creek Foundation Constitution, 2009), and emergency preparedness is an aspect of this remit.

The community of ~167 fulltime residents is spread out along the Squamish Valley Road and Squamish River, with most development on low lying floodplain land. Camp Summit and the Queen of Peace Monastery are also located in the USV. Camp Summit has a capacity of 180 people, caters for youth summer camps and is a year-round outdoor education centre that hosts schools, corporate retreats and other associated activities. The Monastery is a retreat environment with a variable population depending on visitors.

Squamish Valley Road, the only paved access road, is regularly inundated at points and has been washed out by historical flood events. Flood is the most present hazard in the area, and all new housing development in the floodplain area requires raised foundations and/or earthworks to raise foundations and hence mitigate flood risk. However, debris flows, severe storms, interface fire and earthquake all present moderate risk hazards to the community that may have high impact primary and secondary effects (e.g. earthquake affecting land stability causes flood). The community also has the potential to become isolated due to the effects of any of these hazards.

Demographics

Mainly full time residents with some recreational property owners. Camp Summit and the Queen of Peace Monastery host groups of up to 200 people.

Land Use

Single family homes and recreational cabins

Critical infrastructure

Drinking Water	Independent water supply per household from well, tank or stream filtration.
Sanitary/Waste Water Treatment	Septic tank or field.
Electrical Power Systems	BC Hydro supply available to all residences
Gas Heating Systems	No
Communications	Landline, internet access. Unreliable or no cellphone reception

Response Capabilities

Structural fire	No structural fire service.
Wildland interface fire	Crews dispatched from Pemberton. Some local residents have taken S-100 training.
Medical	Nearest BCAS base is Squamish
Police	Nearest RCMP detachment in Squamish
Evacuation	Opportunity for evacuation notitration from SLRD staff.
Communication	Landline and internet access available, subject to any infrastructure impacts. Cellphone service either unavailable or unreliable.

Hazard, Risk and Evacuation

UPPER SQUAMISH VALLEY HAZARD PROFILE

Flood	Debris Flow/ Landslide	Interface Fire	Severe Storm/ Utility failure	Earthquake	Hazardous Material
Red	Orange	Orange	Orange	Orange	Yellow

KEY:*

HIGH RISK
MODERATE RISK
LOW RISK
UNLIKELY

*Note that risk does not equal impact. A low risk event may still occur with high impact.

The risk assessment examines the high and moderate risk hazards.

Evacuation Routes

Evacuation would be south along the Squamish Valley Road towards the District of Squamish at the direction of first responders. The recommended evacuation route will also be printed on the official evacuation notice delivered by first responders and/or published on the SLRD website. No obvious feasible vehicular alternatives.

While water assisted evacuation is conceivable, it is improbable due to the likely hazardous river conditions that would most often accompany the reason for evacuation. If evacuation by road is not possible and sheltering in place is unsafe, then helicopter-assisted evacuation would become necessary, with the Squamish or Whistler as the transfer point.

Community Muster Point: the Ashlu Foundation shipping container, located at 2200 Drummond Road on higher ground.

The Muster Point will be used if evacuation by bus or RCMP escort due to road conditions, or to receive additional information or supplies (e.g. bottled water) before evacuating.

Types of Evacuation

Evacuation

Alert

This is the time to get ready to leave, putting together 'grab and go' bags with essential supplies, papers and prescriptions, and making any other arrangements to leave the property with all household members and pets. Residents may self-evacuate (voluntary) during this time, particularly if they have mobility issues or health conditions that may make it difficult to evacuate quickly. This is also the time to move livestock to safer areas.

Evacuation

Order

Mandatory evacuation occurs when a population is ordered to leave a defined area according to a formal written document that outlines the impact area and why an evacuation is necessary.

Shelter-in

-Place

Essentially, an instruction to the public to stay inside for safety reasons. It may also mean "seal the room", i.e. take steps to stop outside smoke or other contaminants from entering the room.

Evacuation

Rescind

Formal notification that it is safe to return to the evacuated area. The affected area may still be under an Evacuation Alert under further notice, if the hazard still presents a threat.

Flood

The Squamish River system is subject to frequent flooding with the majority of development and the only access road located in the floodplain. Extreme precipitation events have occurred on at least five occasions since 1980 (KWL, 2015). Climate change may be increasing the risk of flooding and the SLRD has commissioned a study to update the floodplain mapping including climate change and debris flood/flow considerations. Flooding may originate from the Squamish River, from feeder creeks and streams, from direct torrential rainfall or a combination of these sources. In terms of stream flow, the flood risk comes from both bank overtopping and an outburst flood scenario, where a collection of woody debris and rocks become lodged in one area by high flows, forming a barrier. The water pooling behind the barrier can rapidly cause flooding of properties nearby, but the greater hazard is from the volume of water and debris released suddenly when the temporary dam gives way.

EVACUATION PROTOCOL:

Evacuate if directed by first responders (imminent threat, tactical evacuation), and/or if an evacuation order is issued by the SLRD due to conditions being assessed as dangerous enough to warrant an evacuation of identified properties. First responders and the SLRD will take a conservative approach in assessing flood risk evacuation trigger points, to ensure resident safety.

Evacuation Alert Trigger Points:

An evacuation alert would be triggered by Environment Canada, the River Forecast Centre forecasting conditions that trigger a flood watch, and/or onsite observation of those conditions.

Evacuation Order Trigger Points:

Evacuate if heavy/torrential rainfall is occurring, and ANY of the following are observed:

- A flood warning is issued by the River Forecast Centre
- Sudden lack of flow in creeks during wet weather
- Landslides occurring in the general area, or sounds of landslides occurring
- Forecast rainfall is occurring, and stream full conditions are occurring or close to occurring.

BC Hydro Daisy Lake Dam

In December 1980 extreme inflow into Daisy Lake Dam reservoir led to water level rising to within 45 cm of the dam crest. Upper Squamish Valley and most of Brackendale were evacuated. Flood frequency was estimated to be from 1 in 30 to 1 in 90 Annual Exceedance Probability (AEP, equivalent to 30-year to 90-year return period) (KWL, 2015)

The inhabited areas of the USV are located downstream of the BC Hydro Daisy Lake dam. BC Hydro has an emergency notification protocol in the unlikely event of a dam failure. Should a dam failure occur, Paradise Valley residents in low-lying areas should immediately follow the instructions of first responders and evacuate to higher ground, well away from the Cheakamus River. Residents in low-lying areas of the USV are strongly encouraged to sign up for the SLRD Alert notification system, as this is the fastest way to receive evacuation instructions related to an imminent dam failure.

Debris Flow/Landslide

With the changing climate the USV landslide risk may also be changing, and updated floodplain mapping should offer new data to assess this associated risk. Historically, the Squamish River has become temporarily impounded by debris flows from Mt Cayley seven or eight times over ~7,000 years with the last event occurring in 1955 (Brooks & Hickin, 1991). While flood is still the likely direct hazard of a debris flow on the community, evacuation protocol and trigger points are included here for completeness, and to provide an understanding of the factors that precede a debris flow or landslide event.

EVACUATION PROTOCOL:

Evacuate if directed by first responders (imminent threat, tactical evacuation), and/or if an evacuation order is issued by the SLRD due to conditions being assessed as dangerous enough to warrant an evacuation of identified properties. First responders and the SLRD will take a conservative approach in assessing debris flow evacuation trigger points, to ensure resident safety. Evacuation will apply to all identified properties at risk, which may result in a partial or full evacuation of the affected community. Evacuation route is preferably via Squamish Valley Road towards Squamish but if the community is isolated by blocked /impassable roads, then helicopter assisted evacuation would be used with Squamish and Whistler as transfer points.

Trigger points for evacuation are taken from the BC Forest Service Wet Weather Safety Guidelines (rainfall and snow melt), provincial experts and conditions at the time.

Evacuation Alert Trigger Points:

- Rainfall event forecast of 25 – 45mm or more in less than 24 hours
- Rainfall event forecast of 25 – 45mm or more in less than 24 hours, plus snow melt calculations (see table #1 below)
- Cumulative rainfall of 40mm or more over >5 days, with additional continued rain forecast and/or snow melt calculations (see table #1 below).

Snow Melt Soil Moisture Input

Snow melt is an important factor in determining the total soil moisture input. The following tables provide guidance as to the amount of snow melt **that must be added** to the

precipitation forecast or recorded in a rain gauge in applicable situations. Snow melt must be considered at or above the slope where the melt event is occurring.

Table #1: 24 Hour Snowmelt additions during rain-on-snow events

Average temperature	Open Area			Forested Area		
	Wind*			Wind*		
	Low	Moderate	High	Low	Moderate	High
0.5-2.0°C	3mm	10mm	25mm	1mm	5mm	11mm
2.1 – 5.0°C	15mm	35mm	75mm	5mm	10mm	25mm
5.1-10.0°C	25mm	70mm	120mm	10mm	28mm	40mm
10.1-15°C	35mm	95mm	160mm	15mm	40mm	60mm

***Low Wind** (<10 km/hr): Leaves and small twigs in constant motion speed; wind extends light flag

Moderate Wind (10-20km/hr, gusts >30km/hr): Small trees sway, maps/paper difficult to hold still.

High Wind (>20km/hr, gusts >40km/hr): Whole trees in motion, clouds moving rapidly, rain blowing sideways.

Tactical Evacuation Trigger Points

Heavy rainfall is occurring, and ANY of the following are observed:

- Sudden muddy water in creeks (especially in gullies)
- Sudden lack of flow in creeks during wet weather
- Cracks appearing in the soil
- Small (anything $\geq 1m \times 1m$) sloughs of soil occurring
- Landslides occurring in the general area, or sounds of landslides occurring
- Blocked culverts
- Forecast rainfall is occurring, and stream full conditions are occurring or close to occurring.
- Thunderstorm or heavy rainfall event not forecast, generating torrential downpours and/or observed debris activity in the affected slide areas.
- Cumulative rainfall of 45mm over >5 days or more, with additional continued rain forecast, plus additional snow melt calculations from table #1 (above).

Interface Fire

The USV community are located in a semi-wooded environment with a mix of deciduous and evergreen trees near development. While not in a heavily forested environment, drier summers

are resulting in conditions that increase the interface fire risk.

During the summer of 2015, a wildfire of note burned in the vicinity of USV. The Elaho Fire extended over 12,000 hectares and burned for almost two months before being assessed as 100% contained.

Potential ignition of an interface fire includes a lightning or human caused forest fire, a structural fire in the community that spreads to the wildland area, and ignition relating to a vehicle collision or sparking that spreads.

The consequences of an Interface Fire event have the potential to be severe depending on ignition point, dryness, and wind conditions.

Evacuation Protocol:

At the **Evacuation Alert** stage:

- Residents with mobility or chronic health issues may choose to voluntarily evacuate to ensure their safety and continuity of care. If they choose to stay at this time, they should contact the SLRD Emergency Program staff to discuss their situation and/or make arrangements with a neighbor if they do not have a vehicle, and their primary healthcare provider if evacuation is medically complicated (e.g. dialysis, oxygen tanks).
- All other residents should make preparations to leave, ensuring that they have a plan for the safe evacuation of all people and pets, gather essential documents, medicines and necessities of food, clothing and other items.

At the **Evacuation Order or Tactical Evacuation** stage:

- At the direction of BC Wildfire Service, RCMP or other authorized first responders, residents will evacuate according to the evacuation route directions given.
- All residents must leave, ensuring that all people and pets in their household safely evacuate, and taking the previously gathered essential documents, medicines, necessities of food, clothing and other items. If these items have not been gathered in advance, there may be no time to take anything at the time of evacuation.
- Emergency Support Services (ESS) will be provided to those evacuated, including emergency accommodation if required.

Severe Storm (All Seasons)

The community may become temporarily isolated by a severe winter snow storm or summer storm with high winds that down trees and potentially knock out power lines nearby. Winter heating is a concern, especially for vulnerable residents. Extended power outages presents health and safety risks including food spoilage, shortage and inability to store medications

requiring refrigeration (e.g. insulin). Downed landlines would leave the community without 9-1-1 service. Blocked access of Squamish Valley Road compromises community access to emergency health services.

EVACUATION PROTOCOL:

Shelter in place until downed power lines are confirmed by first responders or BC Hydro as no longer hazardous. If emergency assistance is required, call 9-1-1 (if able). If a storm related evacuation is required, follow the instructions of first responders and official information from the SLRD. In the event of evacuation, Emergency Support Services (ESS) will be provided to those evacuated, including emergency accommodation if required.

Residents who are vulnerable due to health conditions should discuss a plan in advance with their primary healthcare provider. This may include voluntary self-evacuation when a severe storm event is forecast, access to a back up power supply, and additional supplies of medication or an emergency prescription.

Earthquake

Depending on epicentre, type, and severity, a full range of impacts are possible for USV. Isolation is a significant possibility due to the fragility of the road surface even if structural damage is minimal in the community. Floodplains are more likely to experience ground liquefaction. Depending on time of year, interface fire may result from an earthquake-caused electrical fire, endangering the wider community. Damage to waste water treatment and drinking water systems would create public health concerns and may result in extended evacuation. Damage to communications infrastructure in the wider area may compromise communication to external response agencies.

EVACUATION PROTOCOL:

Remain in the 'Stop/Cover/Hold' position until shaking stops. If you are able, shelter in place until downed power lines are confirmed by first responders or BC Hydro as no longer hazardous. If you feel your house is unsafe, exit the building immediately. If emergency assistance is required, call 9-1-1 (if able). If an earthquake related general evacuation is required, follow the instructions of first responders and official information from the SLRD. Through Rapid Damage Assessment by trained teams, individual residences may be assessed as unsafe, in which case evacuation will be required. Emergency Support Services (ESS) will be provided to those evacuated, including emergency accommodation, food and clothing if required.

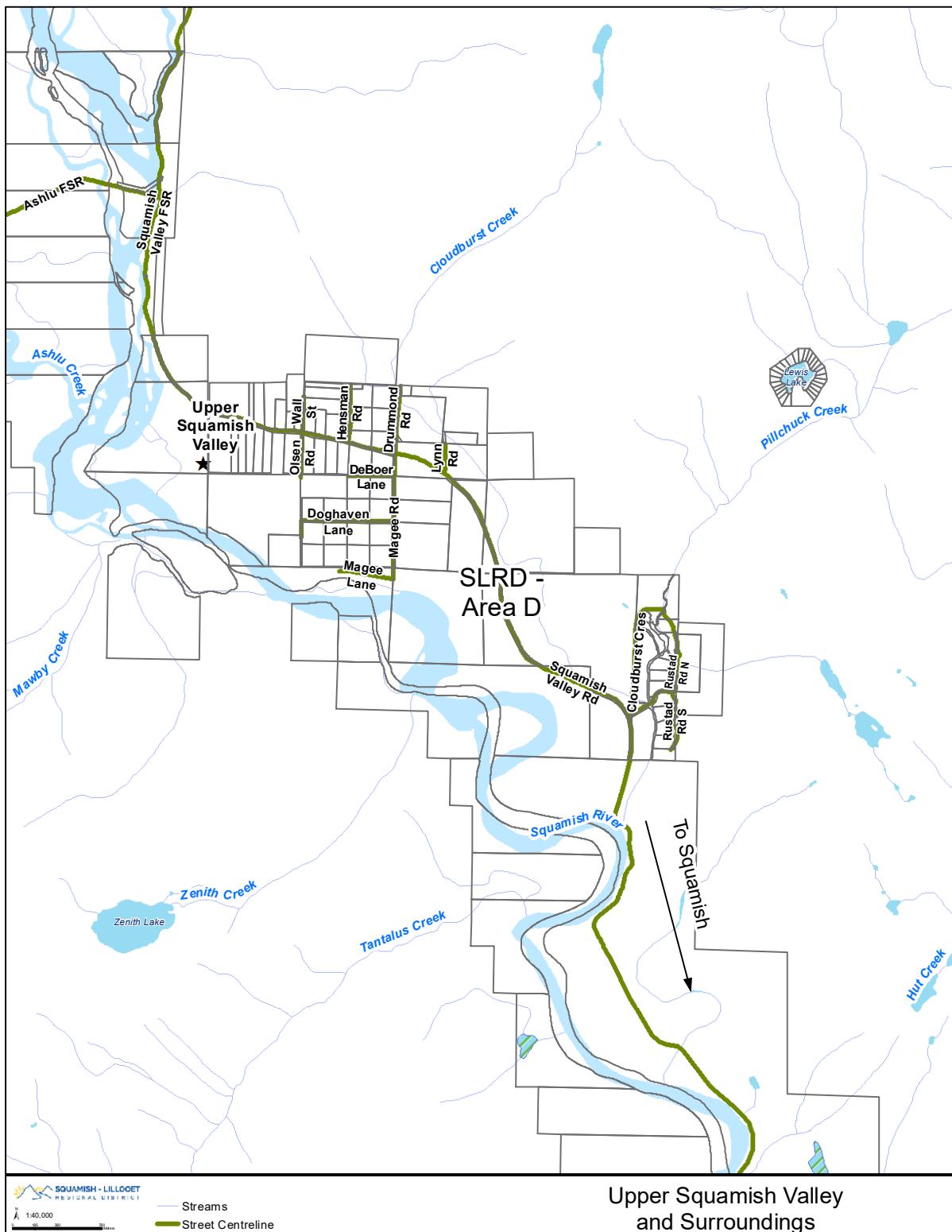
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Free emergency notification service
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draft

Community Map – Upper Squamish Valley



Community Action Plan

The SLRD will work with community representatives every three (3) years to review, assess and update the Community Action Plan.

Historical Actions

- Through the Ashlu Creek Foundation, community members have taken the S-100 Basic Fire Suppression and Safety course.
- The community has established a shipping container with some equipment for emergency use
- Basic fire suppression equipment is now owned by the community through the Foundation.
- Through their community website, USV promotes FireSmarting properties to reduce interface fire risk.
- Independent water and waste treatment system may be a protective element in the event of damaged infrastructure in neighbouring communities.

Current and Future Potential Actions by the Community

- Establish a **Neighbourhood Emergency Team (NET)** with members who have completed a criminal record check (free for volunteers and required in order to be placed in many volunteer roles during response). The SLRD can support the NET through training in basic emergency preparedness, evacuation notification, recovery considerations and other relevant topics that facilitate a two-way knowledge exchange of local government emergency processes and community capacity building. The SLRD can also connect communities to funding when it is available (e.g. FireSmart) and may sponsor a training session by an external provider for multiple communities if budget is available and there is sufficient demand. NET team members would be utilised in a disaster response as qualified volunteers under the direction of the relevant agency. The size of the NET, its organization and the level of training is at the discretion of the community and is independent of the SLRD.

NET team members may be progressively trained in:

- First Aid and simple triage
- Evacuation Processes
- Radio Communication
- Locating victims and resources
- BC Wildfire S-100 Basic Fire Suppression and Safety

- Work to achieve official FireSmart Community status
- Work with the SLRD to develop a basic Disaster Recovery Plan

- Identify vulnerable residents and develop a plan with them for their continued safety in the event of a major emergency (EMBC resources available to assist planning)
- Identify and document skilled individuals in the community (e.g. doctors, nurses, electricians, engineers).
- Practice evacuation notification with the delivery of emergency preparedness public information resources to each house (these resources available through the SLRD)
- Campaign to get all residents signed up to the SLRD Alert emergency mass notification system for direct communication by email, text and landline from SLRD to residents and their nominated emergency contacts.

Looking for more information to make your community Disaster Resilient?

SLRD www.slrdbc.ca/services/emergency-management

GENERAL <http://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery>

ANIMALS <http://www.cgart.org/beprepared.htm>

COMMERCIAL LIVESTOCK <https://www.slrdbc.ca/inside-slrdbc/reports/commercial-livestock-relocation-guide>

FIRE SMART www.firesmartcanada.ca