

Community Emergency Plan

Britannia Beach & Furry Creek



draft

Table of Contents

Key definitions	3
Introduction	4
Community Overview	5
Demographics	5
Land Use	5
Critical infrastructure	6
Response Capabilities	6
Hazard, Risk and Evacuation	7
Evacuation Routes	7
Flood	9
Debris Flow/Landslide	10
Interface Fire	12
Hazardous Materials	12
Earthquake	13
Community Map – Britannia Beach VFD Fire Protection Area	15
Community Action Plan	16

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

Britannia Beach & Furry Creek area

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

Britannia Beach (BB), a small settlement of ~300 residents and host to the Britannia Mine Museum, looks set to grow in the coming years to a population of up to a few thousand, with two substantial development proposals before the SLRD for consideration. Current residential development consists of freehold lots extending above the eastern side of Highway 99 into forested Crown owned land.

Furry Creek (FC) is a community established in 1993 with a golf course and country club plus a permanent population of ~200 residents and 130 houses. Furry Creek is effectively bisected into two neighbourhoods by Highway 99. On the west side and beside Howe Sound is the 56-unit strata community of Olivers Landing, while on the east side of the highway is the golf course and a variety of housing development extending up into the hills above the highway and adjoining forested Crown land.

The two communities are ~5km from each other and are within the fire protection zone of the Britannia Beach Volunteer Fire Department (BBVFD), along with Porteau Cove, which is currently a recreation use only area popular with summer campers. Both communities share easy access to Highway 99 but also the potential of being isolated if this highway becomes blocked to north and south of the communities. The CN Rail Corridor is adjacent to the highway and transports a variety of materials.

The communities are exposed to some interface fire risk due to the surrounding forest, and the proximity of both a main highway and rail corridor increases the potential for a hazardous material incident or a fire igniting from a derailment or vehicle accident. There is also the potential for a hazardous material incident from ship movements through Howe Sound, or from a release of propane from the Fortis BC storage tank located in Furry Creek. The communities are differentially exposed to flood and land movement hazards. Olivers Landing is exposed to storm surge flooding due to its' waterfront location, while the residences on the lower levels of Britannia Beach are exposed to debris flood and outburst flood hazard due to natural and man made topographical features (from historical industrial use). Earthquake is a further hazard, not specifically treated here, but emergency preparedness measures for the other three hazards are consistent with those required for earthquake.

Demographics

A mix of full time and seasonal residents.

Land Use

Single family homes and some common land areas, including some public recreation areas maintained by the SLRD.

Critical infrastructure

Drinking Water	Each community has an SLRD owned and operated water supply system
Sanitary/Waste Water Treatment	BB and FC each have an independent WWT facility owned and operated by the SLRD
Electrical Power Systems	BC Hydro supply available to all residences
Gas Heating Systems	Olivers Landing: Fortis BC supply available to all residences Individual propane tanks at some other residences.
Communications	Landline, internet access and cellphone reception

Response Capabilities

Structural fire	Trained volunteer fire department with two vehicles.
Wildland interface fire	Crews dispatched from Pemberton. Opportunity for more local training
Medical	Fire Department members have first aid training or are in the process of achieving this (2017). Nearest BCAS bases are Squamish (North) and West Vancouver (South)
Police	Nearest RCMP detachment in Squamish
Evacuation	BBVFD members trained in community evacuation process. Community evacuation kit at the Fire Hall.
Communication	BBVFD members trained in radio communications. Landline, cellphone, internet access available, subject to any infrastructure impacts.

Hazard, Risk and Evacuation

HAZARD					
Flood	Debris Flow/ Landslide	Interface Fire	Severe Storm/ Utility failure	Earthquake	Hazardous Material

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 of the following four hazards examines the two communities together, where appropriate, and considers areas separately where the level of risk differs. Hazard exposure may vary between areas due to variables such as geographical differences and additional mitigation actions taken by one of the communities.

Evacuation Routes

Dependent on impacts and location of threat, evacuation route will be:

- north or south along Highway 99 at the direction of first responders. No obvious vehicular alternatives.
- Potential for evacuation on foot via trails down to Highway 99 area but problematic for any evacuee with mobility issues.
- Potential for marine evacuation from the Olivers Landing dock area, and the Britannia Beach dock area with assistance from Canadian Coast Guard and Marine Search and Rescue vessels.

The recommended evacuation route will also be printed on the official evacuation notice delivered by first responders and/or published on the SLRD website.

Community Muster Points, if required, will be:

- parking lot of the Britannia Beach Mine Museum
- parking lot of the Furry Creek Golf Course and Country Club.

The Muster Points will be used if evacuation is 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

Britannia Beach: The flood risk for Britannia Beach is concentrated in the lower lying areas adjacent to Highway 99, with potential flood waters originating from the steep streams above this area and the remaining dams left over from the mining era. Of the original seven dams, two remain and are maintained by the Ministry of Forests Lands and Natural Resource Development Operations and Rural Development (MFLNRORD). These also may be dismantled in the future. In terms of stream flow, the main risk of flooding comes from an outburst flood scenario, where a collection of woody debris and rocks become lodged in one area by high stream 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. If the current development proposal for Britannia Beach proceeds, mitigation measures have been proposed including protective berms, raised foundation levels for buildings and a geobrug debris fence to lower the risk of a hazardous debris buildup.

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:

- 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.

Furry Creek (Olivers Landing): Coastal storm surge flooding as the result of a severe weather event is the main flood risk in this community, along with the potential for an earthquake-driven tsunami wave to reach any low lying coastal community in this area. Evacuation would be via Highway 99 to the north or south, depending on the location of Reception/Registration centres set up for evacuation assistance.

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. Evacuation would be triggered by a severe storm warning with a forecast damaging storm surge for low lying areas, or a Tsunami warning that is forecast to endanger communities in this area.

Debris Flow/Landslide

Britannia Beach and Furry Creek have developed below and on steep slopes backing onto Crown owned forested land that has a number of feeder creeks and streams that ultimately flow out into Howe Sound. The slopes above development have a variable landslide risk depending on vegetation, soil and rock ground composition, slope gradient and moisture content. For example, a fire in a forested area above and away from the community may destabilise previously stable soil, releasing woody debris and soil downslope during spring freshet or a high volume rain 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 flood risk 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 via Highway 99, north or south depending on location of Reception/Registration centres, and potentially depending on whether the highway is blocked in one direction due to a related landslide event. In the event of the community being at risk and unable to evacuate by road, there is the potential for an evacuation via Howe Sound with assistance from the Canadian Coast Guard and Marine Search and Rescue.

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 Point assessment includes:

- Significant rainfall in less than 24 hours
- Significant rainfall, plus snow melt calculations (see table #1 below)
- Cumulative significant rainfall 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 $\geq 1\text{m} \times 1\text{m}$) 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

BB and FC are located in a wildfire environment. Wildfires do occur and exclusion is not a choice. 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, ignition relating to a train accident or sparking, and a vehicle collision related fire on highway 99 that spreads.

The consequences of an Interface Fire event have the potential to be severe for properties located in or near the highly forested areas. Typically, fires burn upwards and hence fires that ignite above and away from communities are most likely not to present a direct threat. However, fires are highly volatile and a number of conditions can affect fire behaviour.

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** 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.

Hazardous Materials

BB and FC are located alongside the main arterial road through the Sea-to-Sky Corridor (Highway 99) and the main rail corridor. A variety of hazardous materials are transported by

road and rail, and fuel spills are possible from both of these sources, with the consequential risk of fire.

Depending on the substance released and its location, sheltering in place may be the only viable option.

The consequences of a Hazardous Materials spill are likely to be highly variable, depending on the substance, proximity, volume, time of day and speed of notification to residents.

EVACUATION PROTOCOL:

At the direction of Vancouver Coastal Health, Ministry of Environment officials or first responders, residents will Shelter in Place or Evacuate depending on the hazardous substance involved. In the event of evacuation, Emergency Support Services (ESS) will be provided to those evacuated, including emergency accommodation if required.

Furry Creek (Olivers Landing):

In the specific case of a leak from the Fortis BC propane storage tank located near this community, a water based evacuation is likely if an evacuation is recommended by the Ministry of Environment Spill Response team and/or resulting from Fortis BC risk assessment. Propane gas stays near the ground and will travel downhill towards Howe Sound, directly affecting Olivers Landing, and compromising a road based evacuation due to the tank location. A water evacuation from the dock at Olivers Landing would be assisted by the Canadian Coastguard and potentially Marine Search and Rescue and additional marine vessels to facilitate the fastest possible evacuation of the community.

Earthquake

Depending on epicentre, type, and severity, a full range of impacts are possible for BB and FC. Isolation is a significant possibility if Highway 99 is blocked (likely) even if structural damage is minimal in the community. Depending on time of year, interface fire may result from an earthquake-caused electrical or gas fire, endangering the wider community. Damage to waste water treatment and drinking water systems in conjunction with extended isolation would create public health concerns. Damage to communications infrastructure in the wider area, e.g. cellphone towers, may compromise communication to external response agencies.

SLRD ALERT.

Be in the know, not in the dark.

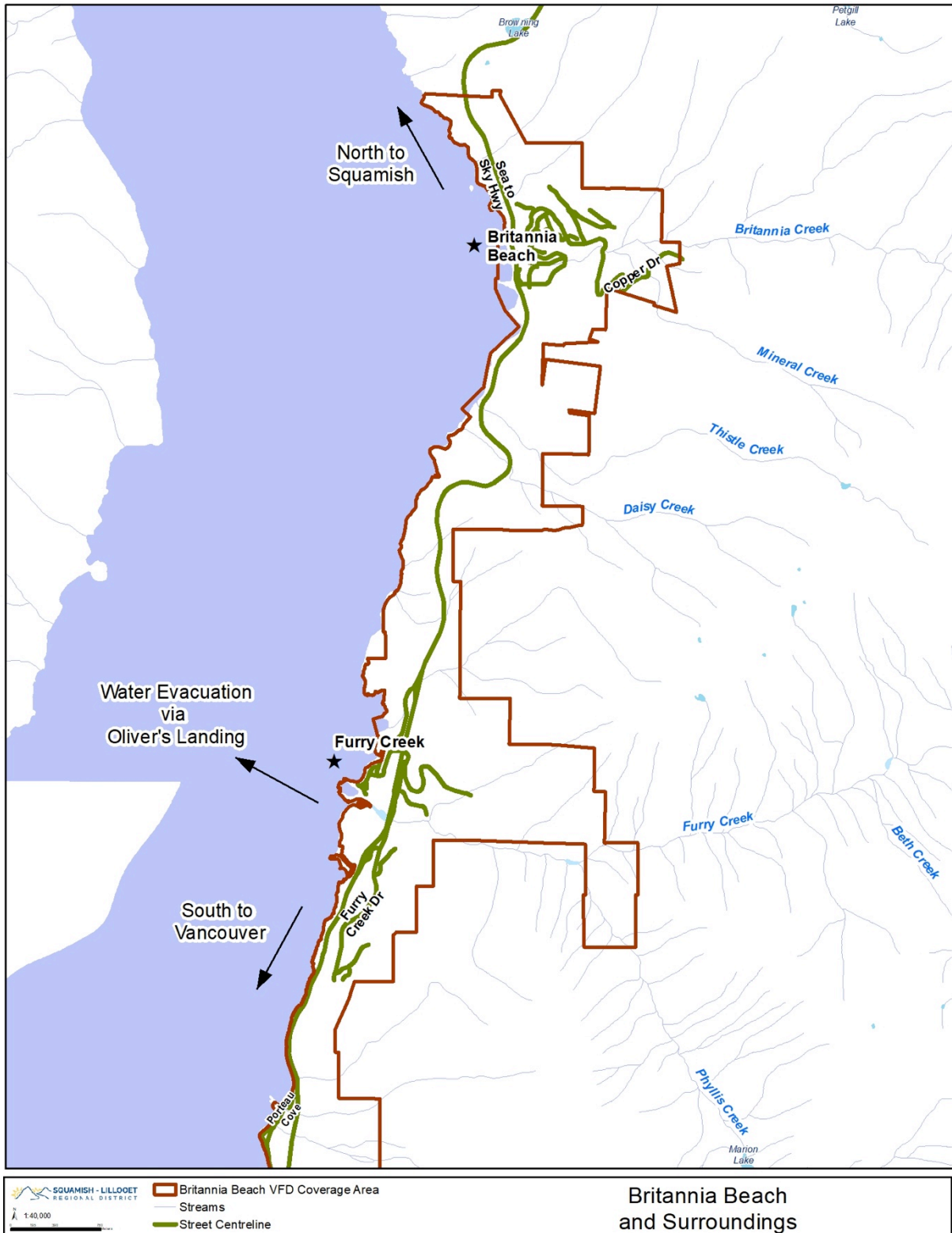
Free emergency notification service
direct from the SLRD to you.
Text, voice message and email options

Sign up: <http://www.slrd.bc.ca/SLRDAlert>

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, including if you smell gas, exit the building immediately. If emergency assistance is required, call 9-1-1. 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.

Community Map – Britannia Beach VFD Fire Protection Area



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

- BB and FC have a group of trained first responders through the volunteer fire department
- Independent water and waste treatment system may be a protective element in the event of damaged infrastructure in neighbouring communities.
- BBVFS has a trained FireSmart community assessor.
- BBVFS have previously distributed FireSmart public education materials in the community.

Current and Future Potential Actions by the Community

- Establish a **Neighbourhood Emergency Team (NET)** in each community, with members who have completed a criminal record check (free for volunteers and required in order to be placed in many volunteer roles during disaster 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
- Hold community FireSmart clean up days once a year to pool resources and remove woody debris from around homes and trim trees in the fire ignition zones. The SLRD may assist with reimbursement for equipment such as wood chippers through the FireSmart grant programme, and provide advice and assistance through the BCWS if a safe burn pile can be established.
 - Work with the SLRD to develop a basic Disaster Recovery Plan

- Fund a generator for emergency power at an agreed community location.
- 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.slrd.bc.ca/services/emergency-management
GENERAL	http://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery
ANIMALS	http://www.cdart.org/beprepared.htm
FIRE SMART	www.firesmartcanada.ca