



## *Bella Coola Emergency Response Plan*

# **HAZARD ANNEX – TSUNAMI RESPONSE PLAN**

*Central Coast Regional District*

*Updated by Frontier Resource Management Ltd  
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# Tsunami Emergency Response Plan

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# 1 Tsunami Emergency Contact List

## **Tsunami Watch Bulletin Issued:**

Emergency Executive Committee – Coordinator

- CCRD Rep
- Secretary
- Nuxalk Rep

Emergency Response Core Team – RCMP

- Ambulance
- Communication Officer
- Public Information Officer
- ESS Officer
- Hospital

Emergency Response Operations

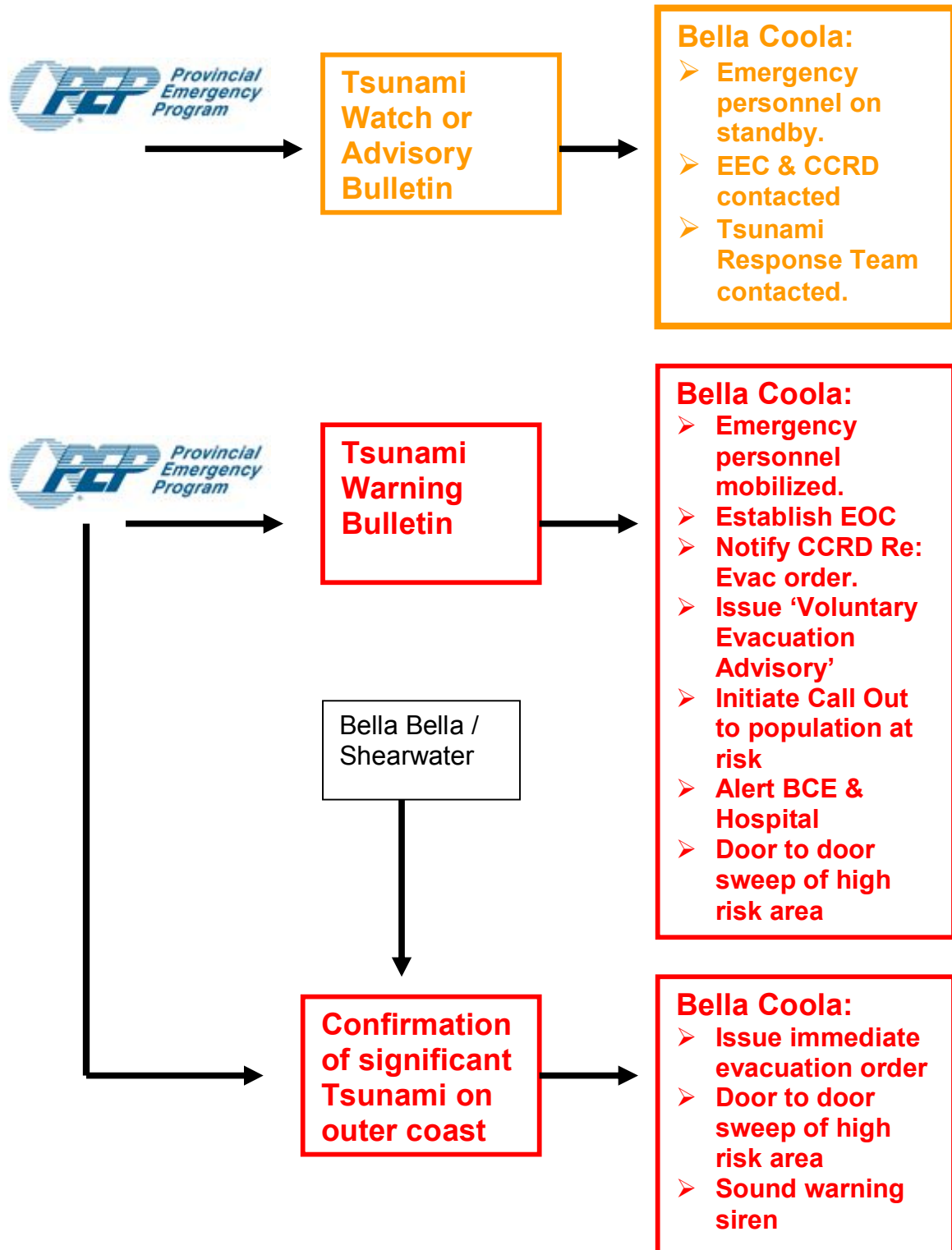
- Fire Halls – Townsite, Nuxalk (2),  
Snootli, Nusatsum
- Harbour Master
- Highways
- Interior Roads
- Rangers
- Saugstad Contracting
- BC Hydro
- Airport
- Bella Coola Air
- DFO
- School District - BCE
- Old Age Home

## **Tsunami Warning Bulletin Issued:**

All of above.

Initiate Call out to residents in Danger zone.

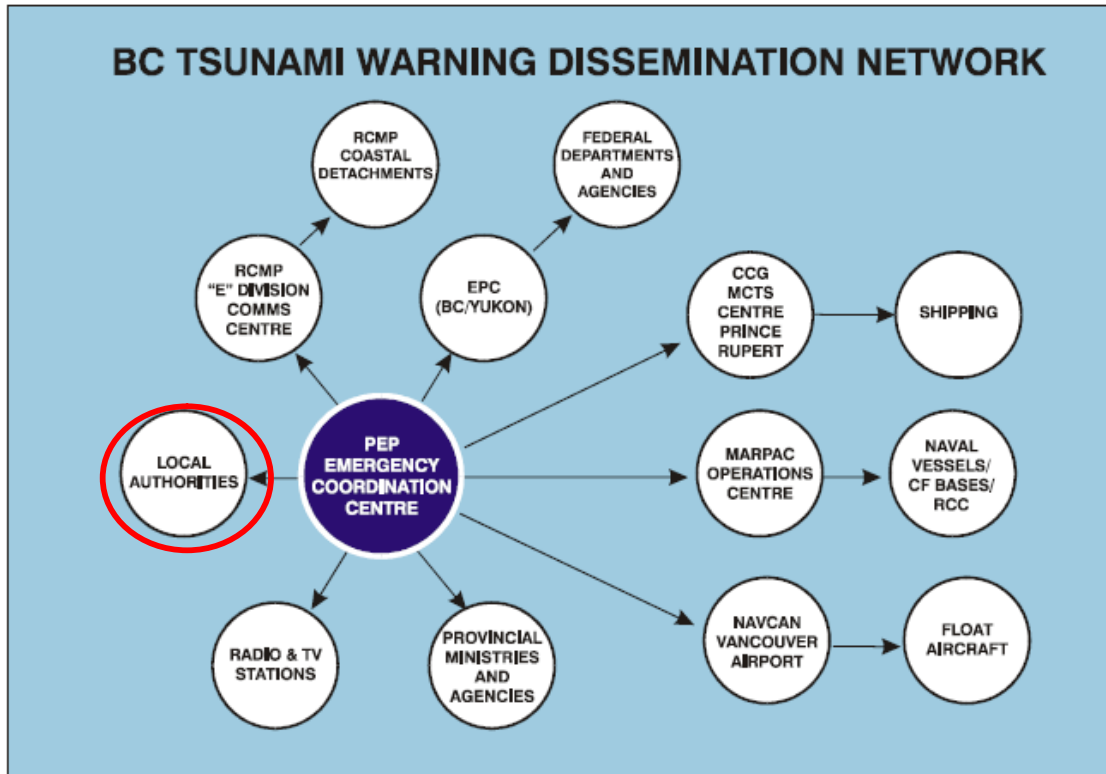
## 2 Tsunami Alert Notification







## 2.1 Provincial Tsunami Warning & Emergency Procedures

The Provincial tsunami emergency procedures are detailed in the British Columbia “Tsunami Notification Process Plan” (2013) a copy of which is contained in Appendix 2. EMBC is responsible for warning and alerting all of the Province, including local authorities as well as ships and float planes in accordance with following schematic. The CCRD is responsible to disseminate warnings to the Bella Coola valley communities.

Figure 1 BC Tsunami Warning Dissemination Network.



EMBC may issue any one or a combination of the following tsunami advisory bulletins. The bulletins have been designed to provide warning of possible tsunami conditions based on scientific observation of previous earthquake effects.

Alert Level	Threat	Suggested Action
 <b>Warning</b>	Inundating wave possible	Full evacuation
 <b>Advisory</b>	Strong currents likely	Stay away from the shore
 <b>Watch</b>	Danger level not known yet	Stay alert for more information
 <b>Information Statement</b>	Minor waves at most	No action required
<b>Cancellation</b>	Tide gauges show no wave activity	Confirm safety of local areas

- **Tsunami Warning** – Highest level of tsunami alert. There is imminent threat of tsunami from large undersea earthquake or confirmation that potentially destructive tsunami is underway. Strongly suggest evacuation of coastal areas.
- **Tsunami Advisory** – Second highest level of tsunami alert. There is threat of a tsunami that has potential to produce strong currents dangerous to those in or near ocean. Significant inundation is not expected but coastal zones may be at risk due to strong currents. Appropriate actions include closing beaches and evacuating harbours and marinas.
- **Tsunami Watch** – Third highest level of tsunami alert. Based on seismic information without confirmation that a tsunami is underway. Potential threat but communities have time to spare. Emergency personnel should prepare to take action in case Watch is upgraded to an Advisory or Warning.
- **Tsunami Information** bulletin may be issued to advise public about an earthquake event that is not expected to generate a

tsunami along the BC coast.

- **Cancellation Message** - cancels any previously issued tsunami messages. Issued when there is no longer observed evidence of tsunami waves at tide gauge stations. Local conditions may differ from those at tide gauge stations and local authorities should determine the safety of coastlines.

Tsunami warnings are issued by different regions and ones affecting Bella Coola are:

- **Entire BC Coastline**- This area will be described as “The Queen Charlotte Islands and the entire coastline from Port Renfrew on Vancouver Island north to Stewart on the Alaska border.
- **Tsunami Zone B** – Central Coast and North East Vancouver Island. Including Bella Bella/Denny Island, Ocean Falls, Bella Coola, Kitimat and Port Hardy.

## 2.2 **Local Notification and Warning**

Once a **Tsunami Warning, Advisory or Watch** bulletins are issued for Zone B - Central Coast area, local emergency personnel will be contacted in accordance with the Communication Plan. This will put local emergency personnel on stand-by alert and to monitor development. CCRD are advised to prepare to issue Emergency Declaration.

## 3 **Tsunami Danger Area**

Bella Coola is located in Tsunami Zone B – Central Coast.

Tsunami danger areas are identified for the head of North Bentinck Arm and Bella Coola. See Tsunami map in Appendix 1.

The high danger area is based on a 5.2 m tsunami wave as predicted by the 1989 Environment Canada and Ministry of Environment Flood Mapping of the Bella Coola Valley. This area includes the harbour and lower levels of Bella Coola townsite as well as Clayton Falls Recreation site and adjacent dry land sort. The moderate danger area is based on the Provincial 20 m elevation guideline for coastal areas. High tide is used as the base to measure from.

### 3.1 Safe Evacuation Zone

The general, EMBC recommended, evacuation instruction for coastal BC is to move to areas 20 m in elevation above sea level.

Location	Evacuation Safe Zones
Harbour	If there is time, up valley locations at Bella Coola, 4 Mile or beyond North Grant Road If not time, go west on North Bentinck Forest Road beyond Sutley Point (but not down to BC Hydro site and picnic area).
Bella Coola	20 m elevation is above the Co-op store so people need to evacuate above that location or east to 4 Mile or beyond North Grant Road.
4 Mile Reserve	20 m elevation is immediately north of Hwy 20 so residential areas are outside the tsunami zone.
Valley	The river flood plain is 20 m above sea level at North Grant Road. People on the river flood plain west of North Grant Road should proceed to higher elevation areas.

Note that Hwy 20 is below 20 m elevation from the Harbour to Bella Coola townsite at Co-op parking lot and most of the way between Bella Coola and 4 Mile reserve.

## 4 Tsunami Emergency Evacuation Plan

- Once a **Tsunami Warning** has been issued, the Emergency Evacuation Plan will be initiated. See Annex E. School buses and ambulances put on standby.
- **Evacuation Alert:** People in the specified tsunami risk area (see Figure 9.1) will be notified of potential evacuation and people should prepare for likelihood of quick evacuation.
  - Harbour, hospital, BCE school and old age home to be notified as priority
  - Columbia Fuels advised to secure fuel depot
  - DFO advised to remove powerboats to high ground (if applicable).
- **Evacuation Order:** Based on reports of actual tsunami occurrence from other coastal areas, an evacuation order may be issued and immediate evacuation of risk area would commence.
  - CCRD advised to issue Emergency Declaration.



- Phone callout initiated for evacuation.
- Manual door to door sweep initiated of high risk areas: harbour and lower Bella Coola townsite.

- **Evacuation Order Rescinded:** Given when danger has passed.

#### 4.1 ***Forewarned Tsunami Alert:***

- In the case of an ocean generated Tsunami, there will be a few hours time to evacuate people to safe areas up valley.
- People will ideally head east, up valley beyond North Grant road as other locations further west may become stranded.

#### 4.2 ***No Official Pre-Warning of Tsunami (local landslide in inlets):***

- In case of massive landslide in local inlets, there will not be time for issuance of warning and survival will depend on people heading to higher ground on their own accord.
- People in lower valley experiencing a hard shaking earthquake for more than 15-20 seconds, should immediately head for high ground at least 20 m. elevation above sea level or east of North Grant Road.
- Bella Coola alarm siren triggered.
- A land slide caused tsunami may be extremely high and fast and people near shoreline areas should head to areas as high as 50 m or more in elevation above sea level.
- Quick access safe areas are:
  - Clayton Falls Forest Service Road – evacuate to area above Hydro Dam.
  - North Bentinck Forest Service Road – 100 m east of Clayton Falls FSR junction.
  - Bella Coola town site – proceed up dirt road behind Fisheries office to above first switchback.
  - Thorsen Creek Forest Service Road – proceed past garbage dump up dirt road above valley floor. Road may be overgrown due to lack of use, so better to continue east on Hwy 20 if possible instead of turning off for this road.
  - These areas may become isolated for a period of time depending on scale of event.

### 4.3 ***Establishment of Road Block***

#### **Location**

- Upon issuance of evacuation order, a road block will be set up at **Thorsen Creek bridge** preventing unauthorized personnel access to lower valley.

#### **Procedures**

- Highways Emergency Coordinator and RCMP will oversee the establishment and staffing of the road block as well as specifying safe work practices and access permission criteria.

### 4.4 ***Special Evacuation Requirements***

Special evacuation assistance will be necessary for the:

- Hospital – ambulatory patients, specialized equipment (see Hospital Evacuation Plan).
- Old age home residents – Approximately 10.
- BC Elementary School – Approximately 60 children age 5-9.

## 5 Tsunami Emergency- Immediate Local Response

### 5.1 *Pre-Event Response and Preparedness*

Pre-event preparedness is to ensure Tsunami Watch and Warning bulletins are communicated to emergency personnel and preparations are made for rapid evacuation, if necessary.

- Set up 'door to door' notification of critical areas by notifying and assigning emergency personnel to areas.
- Prepare to establish EOC once Tsunami Warning is issued.
- Recommended EOC location is Nuxalk Administration Building.

### 5.2 *Primary Event Damage Potential*

A tsunami wave can cause dire consequences to people and damage infrastructure along low level areas close to the ocean (See Figure 9.1 for flood zone).

#### **Human Populations at Risk**

- People at harbour.
- People at dry land sort, BC Hydro station or Clayton Falls Park.
- People at Seniors home in Bella Coola.
- Children at BC Elementary.
- People at Hospital.
- People in Bella Coola townsite.
- People at Tallheo Cannery and residences at Whisky Bay.

#### **Marine Based Installations at Risk**

- Boat harbour and ice plant.
- Ferry dock.
- Shell Fuel Depot.
- Dry land sort and facilities at Clayton Falls.

#### **Access and Transport Structures at Risk**

- Hwy 20 between Bella Coola and harbour.
- Hwy 20 between Bella Coola and 4 Mile Reserve.
- North Bentinck Forest Service Road between harbour and Clayton Falls.
- Docks and ferry terminal.

#### **Power and Utilities at Risk**

- BC Hydro installations at base of Clayton Falls.

- Power poles along affected sections along Hwy 20

### 5.3 ***Immediate Response Following Event***

Tsunamis may be a single wave or a series of waves 10 – 15 minutes apart that can last up to an hour after the first wave arrived. Also, the first wave may not be the largest. Therefore, people should not rush back in after the first tsunami wave arrives. Emergency Coordinator directs emergency personnel when to enter the flood risk zone. Once it is safe to enter, search and rescue shall begin immediately along with damage assessment.

#### **Search & Rescue**

- As directed by Emergency Coordinator search and rescue shall be initiated immediately and conducted by RCMP, Firemen, S&R team, Rangers.
- Boat and air search initiated to look for people swept out to sea.

#### **Damage Assessment**

- In order to coordinate search & rescue and repair of lifeline services, the affected area should be quickly assessed to determine priorities for response with limited resources.
- High priority is to check the Columbia Fuel tank farm at the harbour. Initiate spill response immediately if necessary.
- Hospital is high priority to check.

## 6 **Extended Response Following Event**

After immediate search and rescue is well underway and critical lifeline infrastructure has been checked and priority repairs initiated, Extended Response initiated.

### 6.1 ***Critical Infrastructure Repair***

- Hospital
- Power lines
- Highway
- Communications
- Columbia Fuel Tanks

### 6.2 ***Water and Sewage System***

Water systems may become disrupted or contaminated along with sewage disposal systems and this can lead to longer term health effects and impede disaster recovery.

Qualified personnel to check that water and sewage systems are functioning as a priority.

### **6.3 Volunteer Management**

It is anticipated that there will be many volunteers arriving to the impacted area offering to help.

A Volunteer Coordinator will be specified to control and direct volunteer help to priority areas and dispatch people with appropriate skills to needed areas.

### **6.4 Security of Property**

For areas with forced evacuations or areas suffering major damage, security of property needs to be addressed.

RCMP is responsible for ensuring security and EOC will aid in dispatching personnel to aid with security.

### **6.5 Records and Accounting**

A tsunami can be expected to cause significant deployment of emergency response resources and damage can be severe at a localized level, therefore a person will be designated to initiate accounting and record keeping as the EOC is established.

## **7 Recovery**

Recovery from tsunami may take a few days to a number of months.

### **7.1 Debris Clearing**

Debris resulting from tsunami damage is not expected to significantly impede recovery beyond localized site clean up.

### **7.2 Essential Services Repair**

The priority essential service at risk from tsunami is the hospital which has its own Emergency Plan.

### **7.3 Private and Business Repair**

See ESS Plan.

### **7.4 Reporting and Follow-Up**

Subsequent to the event, an assessment of emergency response performance and debriefing of emergency personnel should be carried out in order to identify areas of emergency response performance.

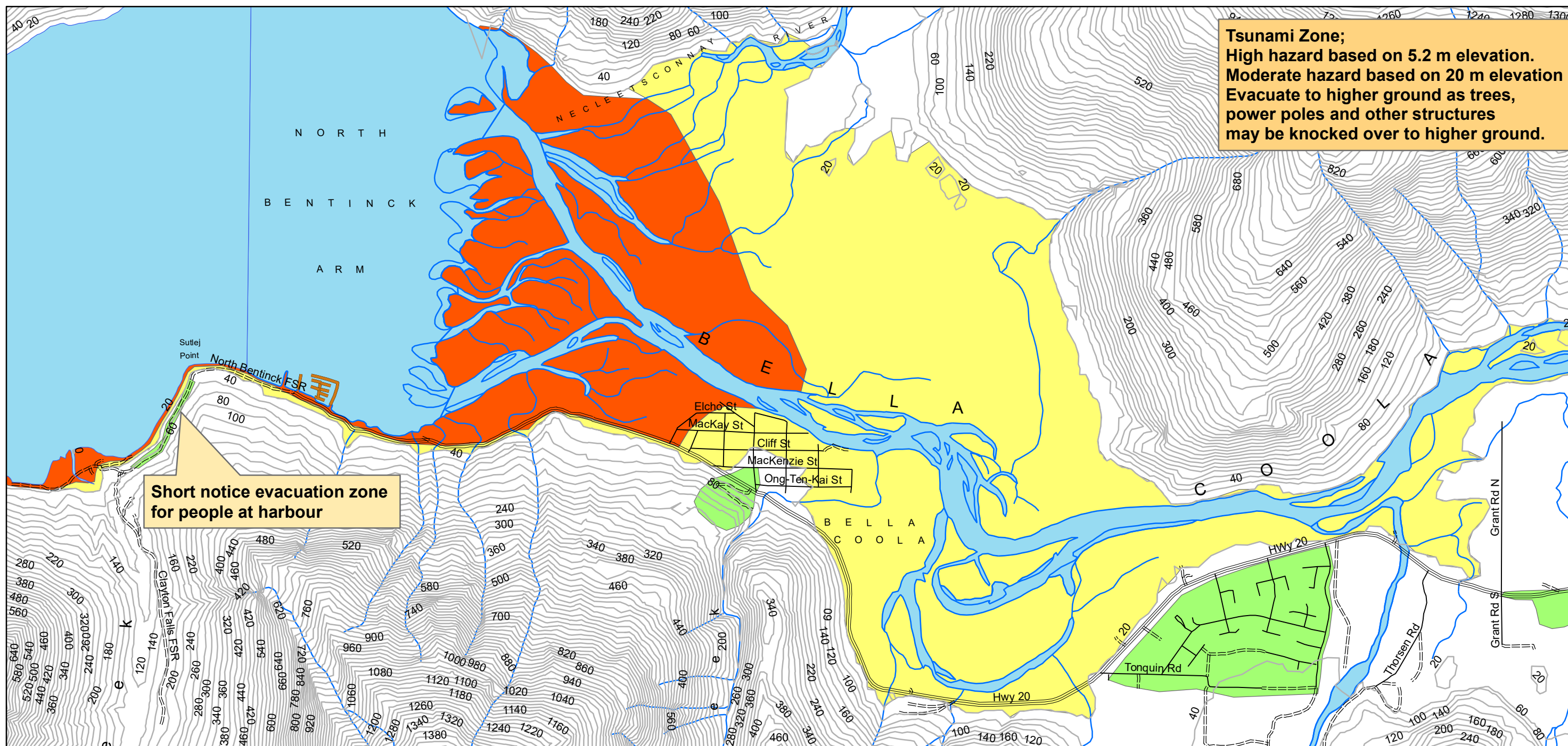
## **Appendices**

### ***Tsunami Danger Zone Map***

### ***BC Tsunami Notification Process Plan***

See CCRD EMP Annex D – EMBC Supporting Emergency Manuals

# Bella Coola Tsunami Hazard



**Tsunami Zone;**  
**High hazard based on 5.2 m elevation.**  
**Moderate hazard based on 20 m elevation**  
**Evacuate to higher ground as trees, power poles and other structures may be knocked over to higher ground.**

**Short notice evacuation zone for people at harbour**



1:25,000

Base map: 103A-020

January, 2018

### Legend

- |                      |                 |
|----------------------|-----------------|
| <b>Tsunami zone</b>  | — Dock          |
| High                 | — 20 m contour  |
| Mod                  | — Streams       |
| Evac                 | — Ocean & Lakes |
| — Road & Ferry Route |                 |

