

**25 PUNAWAITAI RD,CENTRAL HB  
LOT 1 DP 27067**

**1092047637**

This report summarises the known hazards intersecting this property, based on research reports commissioned to assess regional risk – these are summarised below. The hazard assessment methodologies, information compilation and presentation techniques used for these assessments include certain qualifications and limitations on the use, noting:

- a) The hazard information provided is based on the best information available at the time of the studies and was supplied under specific contract arrangements including financial and time constraints.
- b) The hazard information may be liable to change or review if new information is made available.
- c) Councils and other organisations may hold more detailed hazard information than provided here. This Natural Hazard Property Report is not a substitute for a Land Information Memorandum (LIM).
- d) The precision and accuracy of the data varies, therefore it is important that you obtain expert advice to help to interpret the information.

The hazard maps in this report are based on the following referenced research reports. Online HBRC Natural Hazards Report Database contains a register of the hazard research reports and publications from either the Council or external organisations and this database may contain other pertinent information related to this area. Go to [www.hbrc.govt.nz](http://www.hbrc.govt.nz) and search #hazards:

The referenced reports are:

- (i) Earthquake Fault lines
  - Earthquake hazards in Hawke's Bay Initial assessment
  - Earthquake hazard analysis - Stage 1. Recurrence of large earthquakes determined from geological and seismological studies in the Hawke's Bay area
  - Active Fault Mapping and Fault Avoidance Zones for Central Hawkes Bay District: 2013 Update Active Fault Mapping and Fault Avoidance Zones for Hastings District and environs
  - Fault Avoidance Zone Mapping for Wairoa District, Napier City and surrounds
- (ii) Earthquake Liquefaction
  - Assessment of liquefaction risk in the Hawke's Bay: Volume 1: The liquefaction hazard model
  - Assessment of liquefaction risk in the Hawke's Bay: Appendices for Volume 1
- (iii) Earthquake Amplification
  - Hawke's Bay Regional Council earthquake hazard analysis program, Stage III : evaluation of ground shaking amplification potential Volume 1
  - Hawke's Bay Regional Council earthquake hazard analysis program, Stage III : evaluation of ground shaking amplification potential Volume 2: Appendices
- (iv) Tsunami Inundation Extents
  - Hawkes Bay Tsunami Inundation by Attenuation Rule
  - Review of Tsunami Hazard in New Zealand
- (v) Flooding Extents
  - Wairoa River Flood Hazard Study
  - TeNgaru Catchment Flood Hazard Study
  - Waipatiki Catchment Flood Hazard Analysis
  - Kopuawhara Opoutama Flood Hazard Analysis
- (vi) Coastal Hazard
  - Regional Coastal Environmental Plan
  - Clifton to Tangoio Coastal Hazards Strategy 2120 - Coastal Hazard Assessment
  - Clifton to Tangoio Coastal Hazards Strategy 2120 - Coastal Risk Assessment
  - Other Coastal Hazard Reports
  - Cliff Hazard Zone Delineation
- (vii) Landslide Risk

- Roll out of Erosion Models for Regional Councils: Landcare Research Limited
- Earthquake-Induced Landslide Forecast and Hazard Assessment, Hawke's Bay Region.
- Earthquake-Induced Landslide Forecast and Hazard Assessment, Bluff Hill, Napier.

(viii) Quaternary Geology

- Hawke's Bay Regional Council earthquake hazard analysis program, Stage III : evaluation of ground shaking amplification potential Volume 2: Appendices

(ix) Wairoa River Bank Stability Zones

- Wairoa River Bank Stability Assessment

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3. The hazard information provided does not imply any actual level of damage to any particular structure, utility service or other infrastructure.
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### Liquefaction

Low (cream) means there might be 'none to minor' liquefaction for 500 year earthquake shaking (typically larger than magnitude 6), medium (orange) means there might be 'minor' to moderate damage, and 'high' (brown) might be moderate to severe damage.

In Wairoa District, Central Hawke's Bay District and the wider Hastings District (outside the Heretaunga Plains) due to the limited data available to assess vulnerabilities, buffer zones have been added to liquefaction hazard areas. The width of this buffer zone is 500 m (+/- 250 m) and allows for the differences between the accuracy of lines on a geological map at a scale of 1:250 000 (+/- 250m) and the greater accuracy of property boundaries on cadastral maps to be reconciled. If a property is located wholly or partially within the buffer zone this indicates that there is uncertainty about the level of liquefaction hazard. Site specific assessments (ranging from visual inspection through to ground investigations) will be needed to determine the level of liquefaction hazard. If a buffer zone boundary line falls across a property it should initially be treated as being part of the higher hazard class when interpreting the map.

Liquefaction occurs when waterlogged sediments are agitated by an earthquake. As a result, the soil behaves like a liquid, has an inability to support weight and can flow down very gentle slopes. This condition is usually temporary, but buildings can sink and underground pipes may rise to the surface. When the shaking stops, groundwater is squeezed out of the ground causing flooding, leaving areas covered in mud.

Liquefaction effects have been reported in the Hawke's Bay region during four historical earthquakes since 1840 at Modified Mercalli (MM) shaking intensities between MM7 and MM10, including in 1931. Low-lying areas in the region, especially these near the coast, and reclaimed land are particularly susceptible.

What can you do?

If building, it is recommended you reference the Ministry of Business, Innovation & Employment (MBIE) and the Ministry for the Environment document "Planning and engineering guidance for potentially liquefaction-prone land" and if necessary obtain expert advice from a qualified and experienced geotechnical engineer.

Important to note that having land included in a particular zone does not unequivocally mean that the land is "good", "medium" or "bad." The maps indicate what is a strong possibility across those areas. The best areas (cream) have a very low probability of having a liquefaction problem, but there may still be some localised places where the hazard exists. The only sure way of showing whether a specific site has low or high vulnerability is a site specific geotechnical investigation.

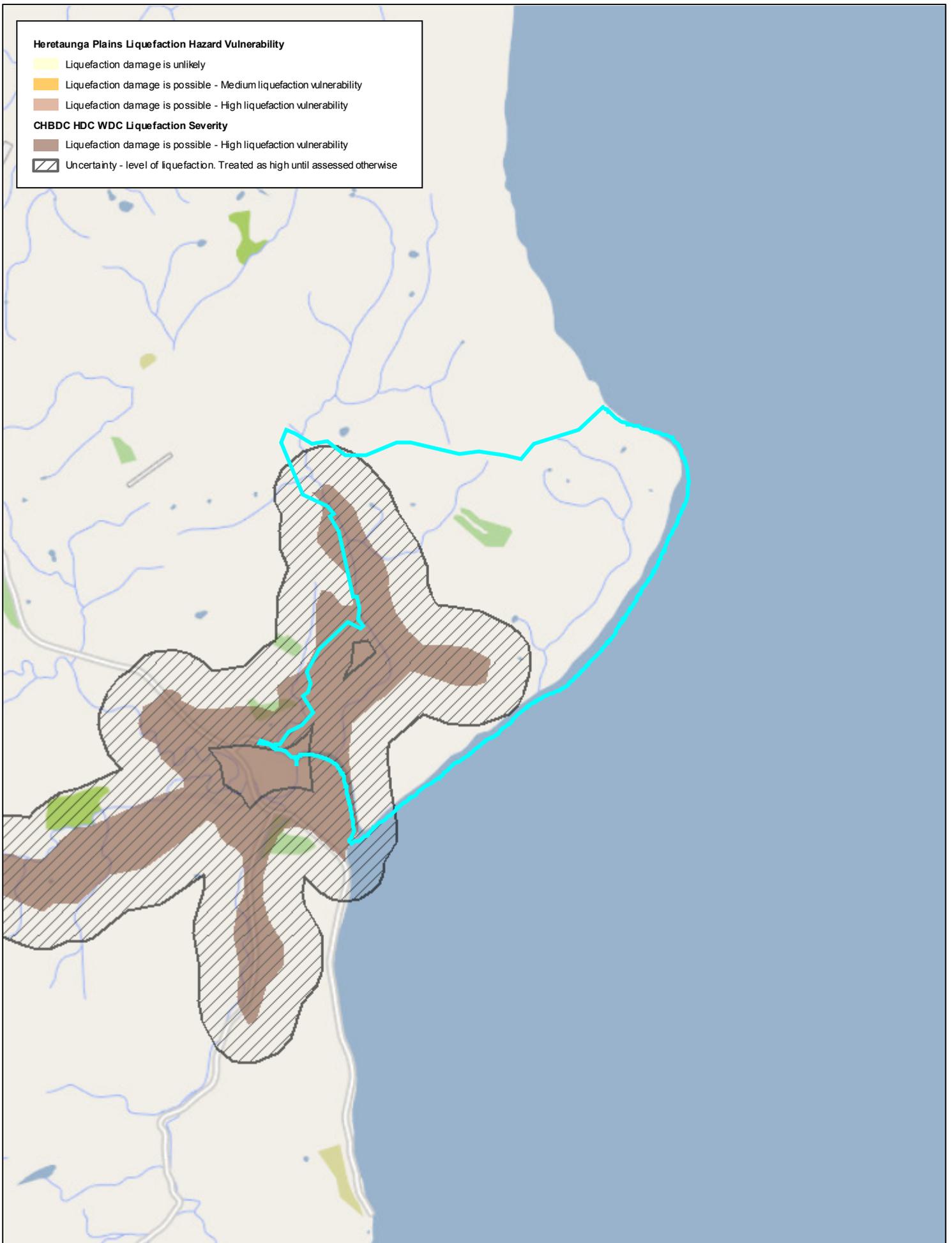
On a property already developed, there are options to mitigate the risk of liquefaction, but the easiest way to mitigate liquefaction risk is to ensure your insurance sum-insured is sufficient to rebuild with heavier duty foundations in the event of total loss (noting this could be fire or flood - not just earthquake).

**Heretaunga Plains Liquefaction Hazard Vulnerability**

- Liquefaction damage is unlikely
- Liquefaction damage is possible - Medium liquefaction vulnerability
- Liquefaction damage is possible - High liquefaction vulnerability

**CHBDC HDC WDC Liquefaction Severity**

- Liquefaction damage is possible - High liquefaction vulnerability
- Uncertainty - level of liquefaction. Treated as high until assessed otherwise



**Liquefaction Hazard**

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### Amplification

This amplification map shows areas susceptible to ground shaking in an earthquake. Most of the damage during an earthquake is caused by ground shaking. Seismic waves, travelling through the earth at different speeds and amplitudes because of a fault rupture, cause the ground to vibrate and shake in an earthquake. The intensity of ground shaking at any location is affected by the magnitude of the earthquake, proximity to the source of the earthquake, and the geological material underneath that location. Larger earthquakes generally produce greater shaking and shaking is usually more intense nearer the source of the earthquake.

Different frequencies of shaking also affect buildings differently - in general, low frequency motions affect taller buildings more, while high frequencies affect shorter buildings. The type of material underlying the site can have a great effect on the nature and intensity of the shaking. Sites underlain by hard, stiff material such as bedrock or old compacted sediments usually experience much less shaking than sites located on young, loosely consolidated sediment, which tends to amplify shaking.

What can you do?

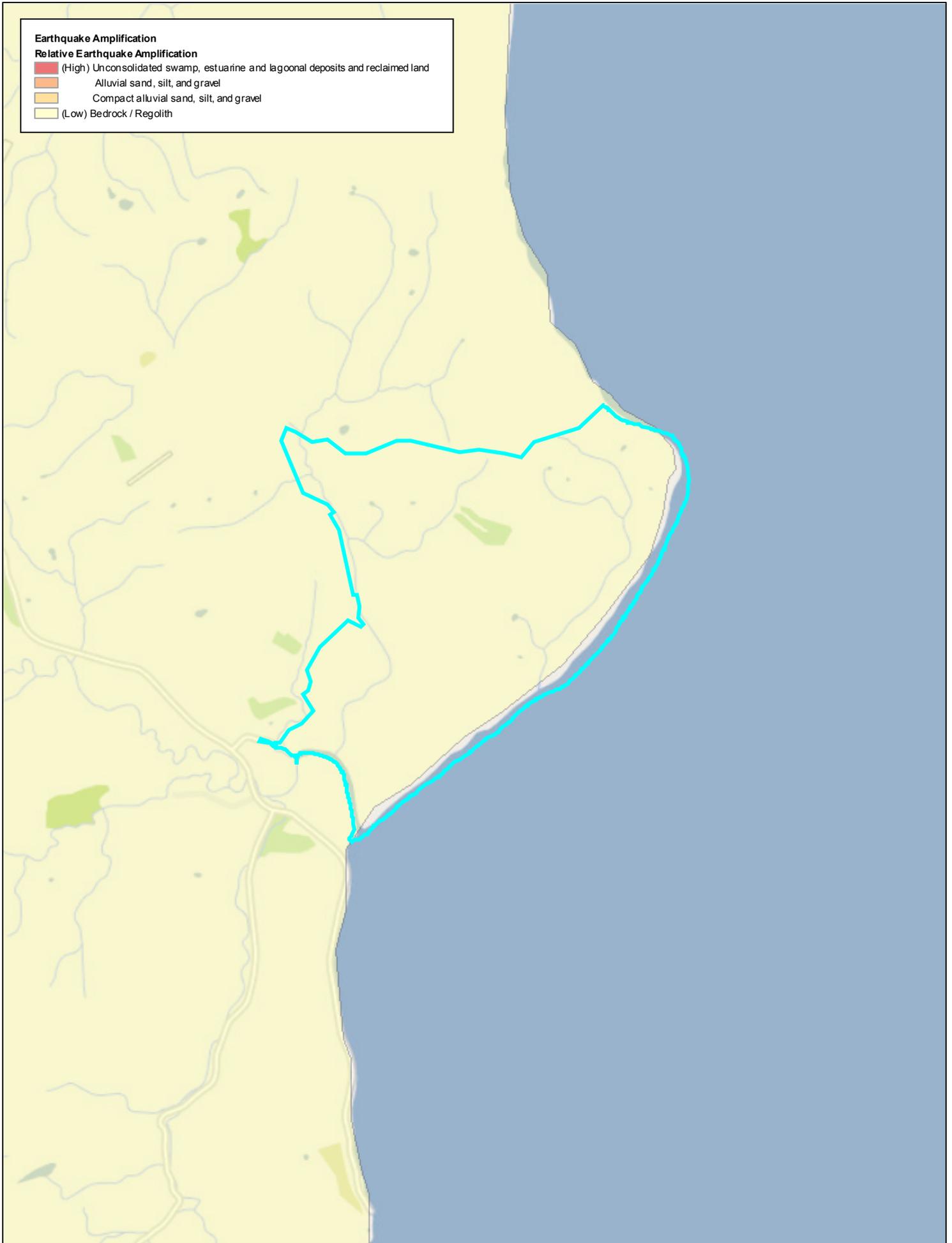
Most people in Hawke's Bay will survive a large earthquake with some loss, but some people will be severely affected. If you are developing land in a susceptible area, it is recommended owners/developers obtain expert advice from a qualified and experienced geotechnical engineer before progressing plans.

On a property already developed, the easiest way to mitigate earthquake risk is to ensure your insurance sum-insured is sufficient to rebuild with heavier duty foundations in the event of total loss (noting this could be fire or flood - not just earthquake).

**Earthquake Amplification**

**Relative Earthquake Amplification**

- (High) Unconsolidated swamp, estuarine and lagoonal deposits and reclaimed land
- Alluvial sand, silt, and gravel
- Compact alluvial sand, silt, and gravel
- (Low) Bedrock / Regolith



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**Earthquake Amplification**

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### Flooding

The map shows general details about flooding patterns and areas at risk. There are 3 coloured zones; Blue (flood risk areas), cream (low risk areas) and cross-hatch blue (areas not included in the flood study and which may or may not be susceptible to flooding).

The maps have been produced using computer models using verification with actual events where possible. Flood extents shown in the maps are not meant to show specific flooding details on each property.

Flood modelling is based on 100 year return period events (1% annual exceedance probability) for river flood risk areas, and 50 year return period events (2% annual exceedance probability) for floodplain flood risk areas.

The effects of climate change have not been included in this flood modelling.

These maps should not be relied upon as the sole basis for making any decision in relation to potential flood risk. Contact the Hawke's Bay Regional Council Engineering Department if further information is required with regards to a specific property.

Urban pipe networks and flooding on the street network in the urban areas have not been considered in the flood modelling. Urban areas show flood risk areas that are the result of the capacity of open drains being exceeded.

In some flood risk areas, houses and other structures may be elevated above the ground, and would be considered not floodable. These cases are not identified in this flood modelling.

#### Flooding vs. Ponding

Major flooding happens when the capacity of a stream or drain is exceeded. Small scale, localised ponding may occur in areas where water cannot get to the stream through the normal paths of overland flow when the streams are not in flood. The flood hazard study does not consider this type of localised ponding in detail.

Learn more about our flood risks <https://www.hbemergency.govt.nz/hazards/storms-and-floods/>

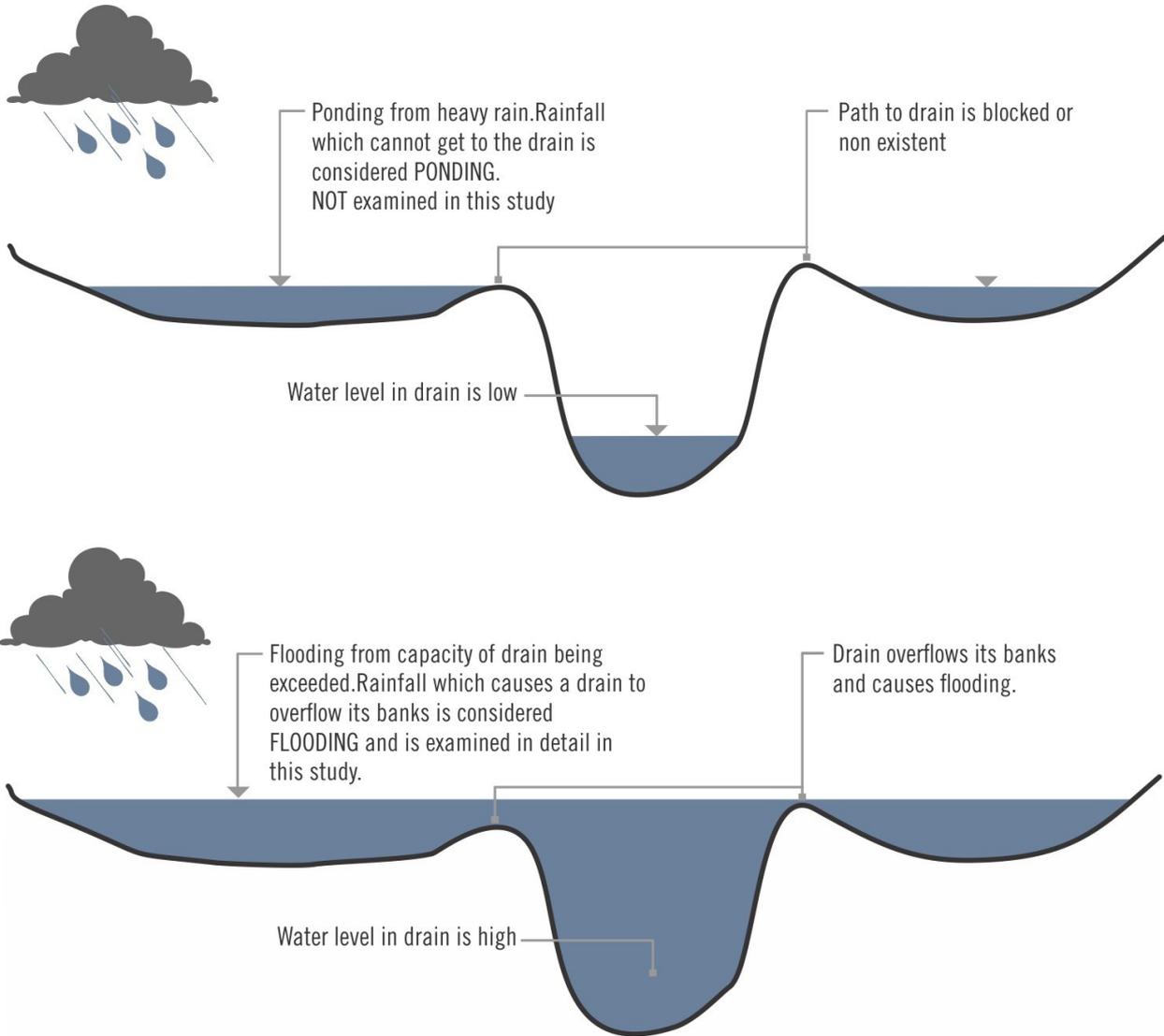
#### What can you do?

If you are thinking about buying a property which is subject to flooding:

1. Get a Land Information Memorandum (LIM) report from the city or district council.
2. Find out about the history of the area. Ask local people who have lived in the area for a long time about events in the past.
3. Check out your potential purchase during a storm.
4. Be aware a resource consent may be required for any new building or additions or extensions to existing buildings on the property.

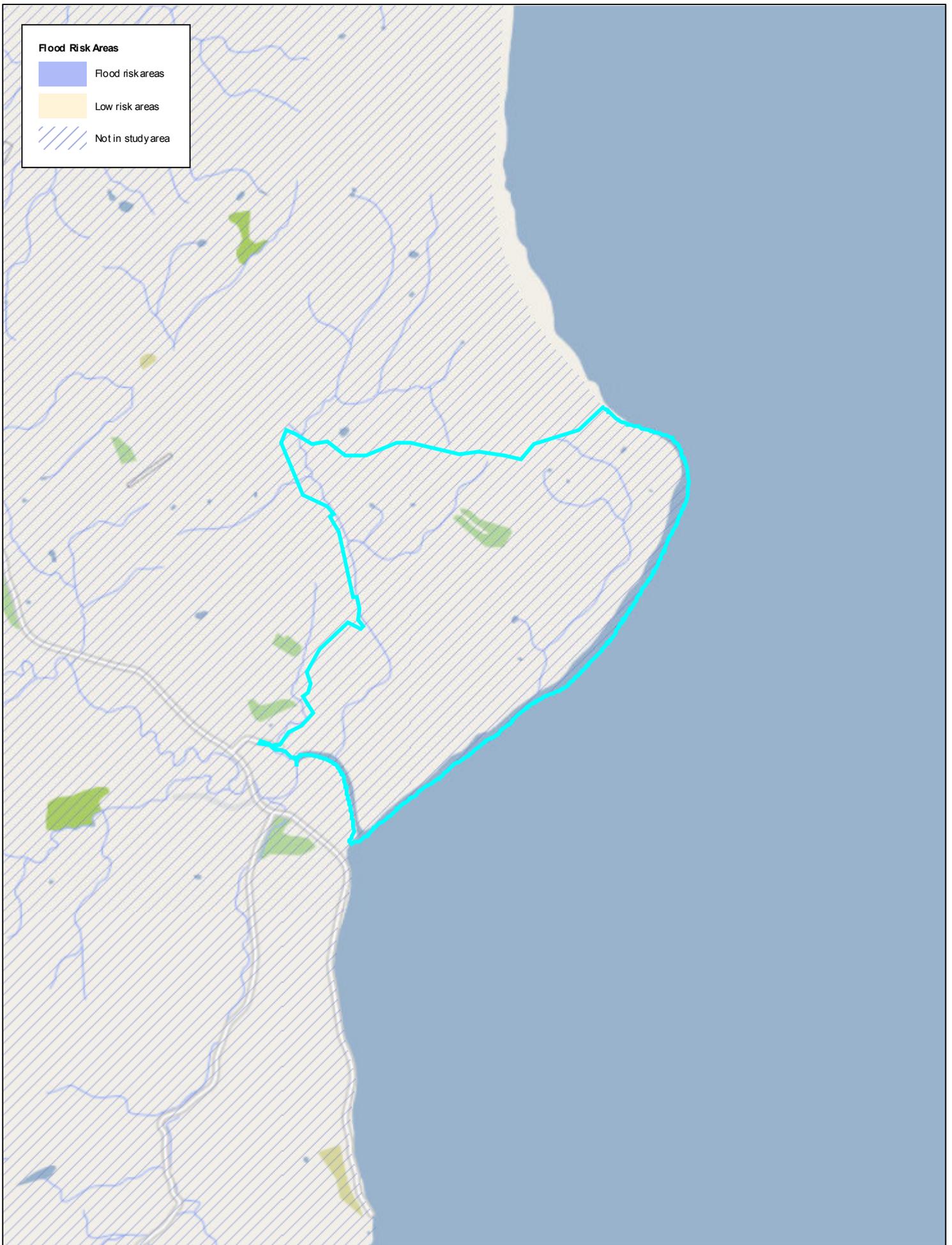
If you already own a property at risk from flooding, then:

- a. Organise a household emergency plan and be prepared to evacuate quickly if necessary.
- b. Check the weather forecast regularly as severe weather watches and warning are issued by the MetService and are available via email alerts.
- c. If a flood is imminent, lift valuable household items and chemicals as high above the floor as possible. Consider using sandbags to protect your home.



**Flood Risk Areas**

-  Flood risk areas
-  Low risk areas
-  Not in study area



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## Flooding

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## Natural Hazards Report

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05/05/2021

### Coastal Environment

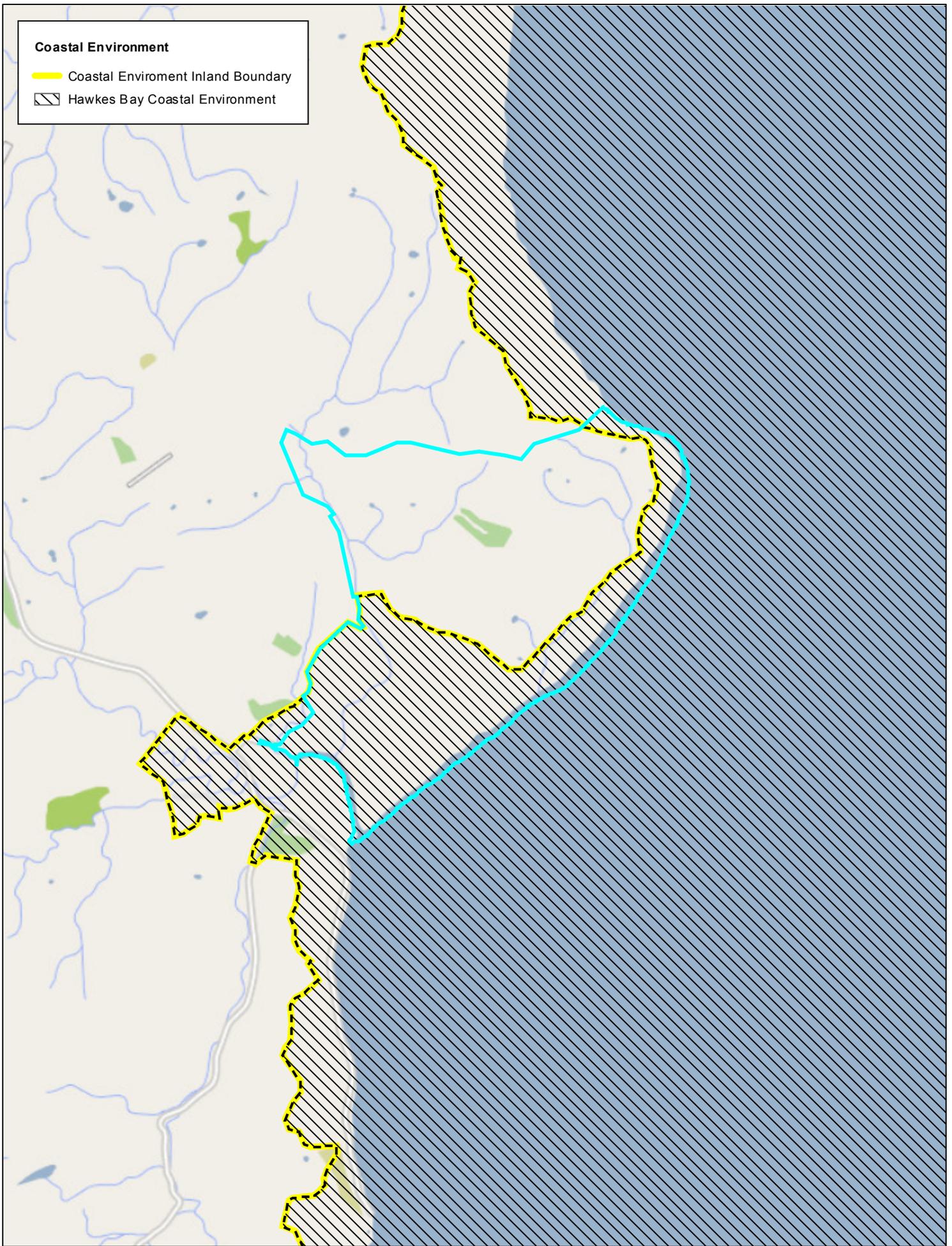
The Coastal Environment means an environment in which the coast is a significant element or part, and includes:

- (a) The coastal marine area;
- (b) Any areas identified as being affected by, or potentially affected by, coastal flooding or coastal erosion;
- (c) Any of the following:
  - I. Tidal waters and the land above mean high water springs;
  - II. Dunes;
  - III. Beaches;
  - IV. Areas of coastal vegetation and coastal associated fauna;
  - V. Coastal cliffs
  - VI. Salt marshes;
  - VII. Coastal wetlands, including estuaries; and
  - VIII. Areas where activities occur or may occur which have a direct physical connection with, or impact on, the coast.

For the purposes of the Regional Coastal Environment Plan, the coastal environment comprises all of the coastal marine area of Hawke's Bay and the coastal margin.

**Coastal Environment**

-  Coastal Enviroment Inland Boundary
-  Hawkes Bay Coastal Environment



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**Coastal Environment**

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### Coastal Hazards

Hawke's Bay Region has over 350km of open coast and estuary shoreline. This ranges from rocky shores and cliffs to dunes, sandy beaches and gravel beaches. Our shoreline does not stay in one place. It changes position in response to storms, large waves and high tides. Landward movement of the shoreline - coastal erosion - is usually in response to these natural processes. Such changes in shorelines are typically only a problem when property, infrastructure or other human assets have been built too close to the shore and become threatened.

Coastal hazards include tsunami, storm erosion and storm flooding. The present-day extent and likelihood of various coastal hazard risks are expected to increase as a result of climate change projections of increased storm intensities and a rise in sea level of around one metre in the next 100 years.

The Regional Coastal Environment Plan identifies Coastal Hazard Zones ('CHZs') to assist HBRC and communities make informed decisions about managing risks associated with coastal erosion and coastal flooding. The Regional Coastal Environment Plan contains three key objectives regarding coastal hazards:

- Risks posed by coastal hazards to people and property are avoided or mitigated.
- To avoid new and further inappropriate development in areas identified as being currently at risk of coastal erosion or inundation (i.e.: those areas within Coastal Hazard Zone 1).
- To avoid new and further inappropriate development in areas identified as being at risk of coastal erosion or inundation during the next 100 years (i.e.: those areas within Coastal Hazard Zone 2 or Coastal Hazard Zone 3), taking into account the risk associated with global sea level rise and the level of protection afforded by natural coastal features and lawfully established coastal protection structures.

Coastal hazard zones identified in the Regional Coastal Environment Plan are:

- Coastal Hazard Zone 1 (CHZ1) which represents land assessed as being subject to storm erosion, short-term fluctuations and dune instability and includes river mouth and stream mouth areas susceptible to both erosion and inundation due to additional hydraulic forcing of river or estuary systems. For the purposes of this Plan, it extends a distance of 200m seaward from its inland boundary.
- Coastal Hazard Zone 2 (CHZ2) which represents land assessed as being potentially at risk up to 2100 due to long term rates of coastal erosion and at some locations, may also include areas assessed as being potentially at risk of sea water inundation in a 1 in 50 year combined tide and storm surge event. It includes allowance for sea level rise, but does not include land within Coastal Hazard Zone 1 or Coastal Hazard Zone 3.
- Coastal Hazard Zone 3 (CHZ3) represents an area of land assessed as being potentially at risk of sea water inundation in a 1 in 50 year combined tide and storm surge event, and includes allowance for sea level rise, but does not include land within Coastal Hazard Zone 1 or Coastal Hazard Zone 2.
- Transition Hazard Zone represents an area of land assessed as being within CHZ1 or CHZ2 and also potentially at risk of cliff shore erosion processes.

Sea water inundation referred to in CHZs 1-3 do not relate to tsunami events. That is a separate risk assessment.

### REPORTS TO INFORM CHZs

The Regional Coastal Environmental Plan's CHZs have been based on a number of earlier technical assessments of coastal erosion and inundation. Many of those reports can be viewed on the HBRC's website: [www.hbrc.govt.nz](http://www.hbrc.govt.nz) (keyword #hbcoast) [Coastal Hazards](#)

### What can you do?

If you are thinking about buying a house near the coast you can reduce the risk of purchasing a property that may be affected by coastal erosion or flooding by:

1. Getting a Land Information Memorandum (LIM) report from the city or district council.
2. Finding out about the history of the area. Ask local people who have lived in the area for a long time about how the shoreline has changed and how much erosion has happened in the past.
3. Checking out your potential purchase during a storm or when the tide is running high.
4. Thinking about how the location of the shoreline may change over the next few decades, based on past changes and possible future accelerated change due to sea level rise.
5. Assessing whether there is room to relocate the buildings on your property further landward on your section if erosion threatens it, and check the council's consent requirements for relocating.
6. Being aware that building seawalls to protect your property is rarely an effective long-term solution. It may be difficult to gain resource consent to build a new seawall because seawalls can worsen the erosion effects on your neighbours.
7. Being aware a resource consent may be required from the Regional Council for any new building or additions or extensions to existing buildings on the property.
8. Being aware that the coastal hazard zone is an assessment of areas at risk of erosion or flooding in the future based on data and knowledge currently available about sea level rise and climate change.
9. Being aware that the Clifton to Tangoio Coastal Hazards Strategy is currently reviewing coastal hazards risks along that stretch of coastline to ensure the most accurate and up to date data and science are being used and this Strategy may result in changes to the coastline and coastal planning responses.
10. Being aware that if the councils do implement actions such as beach re-nourishment or building a seawall, then owners of nearby properties are very likely to be charged for their fair share of the costs of those works and the ongoing maintenance.

If you already own a coastal property, then

Get some advice. Check the information reports on coastal hazard studies and management options. However, there are no magic solutions, and ultimately retreating back from the coast may be the only cost-effective option if erosion continues. The traditional 'solution' to such coastal erosion problems is to build a seawall to 'hold' or 'advance the line'. Such actions unfortunately are rarely the most effective option in the long-term, often being only effective for a few years, and can lead to a false sense of security and further development behind the seawall. Seawalls can also exacerbate erosion along adjacent sections of coast.

Plan a retreat. Determine whether there is scope to relocate the buildings on your property, either further landward on your section, or to another location. This should be a particular consideration when planning to re-develop, upgrade or extend the property. Despite the up-front costs, on severely eroding coasts, relocation can often be the most cost-effective and appropriate solution in the longer-term. Relocating your dwelling may require a permit from the city or district council.

Get some advice. Check with the regional council about possible resource consent requirements if you are thinking of doing building work or earthworks on your property within a coastal hazard zone. Also check with the city or district council about building permit requirements and possible limitations of subdividing properties.

Engage. Talk to the regional council or district / city council about the Clifton to Tangoio Coastal Hazards Strategy and engage in strategy development, particularly the design, timing and costs of preferred options for local action.

### Coastal Hazard Zones

The Regional Coastal Environment Plan identifies Coastal Hazard Zones ('CHZs') to assist HBRC and communities make informed decisions about managing risks associated with coastal erosion and coastal flooding. The Regional Coastal Environment Plan contains three key objectives regarding coastal hazards:

- Risks posed by coastal hazards to people and property are avoided or mitigated.
- To avoid new and further inappropriate development in areas identified as being currently at risk of coastal erosion or inundation (i.e.: those areas within Coastal Hazard Zone 1).
- To avoid new and further inappropriate development in areas identified as being at risk of coastal erosion or inundation during the next 100 years (i.e.: those areas within Coastal Hazard Zone 2 or Coastal Hazard Zone 3), taking into account the risk associated with global sea level rise and the level of protection afforded by natural coastal features and lawfully established coastal protection structures.

Coastal hazard zones identified in the Regional Coastal Environment Plan are:

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Sea water inundation referred to in CHZs 1-3 do not relate to tsunami events. That is a separate risk assessment.

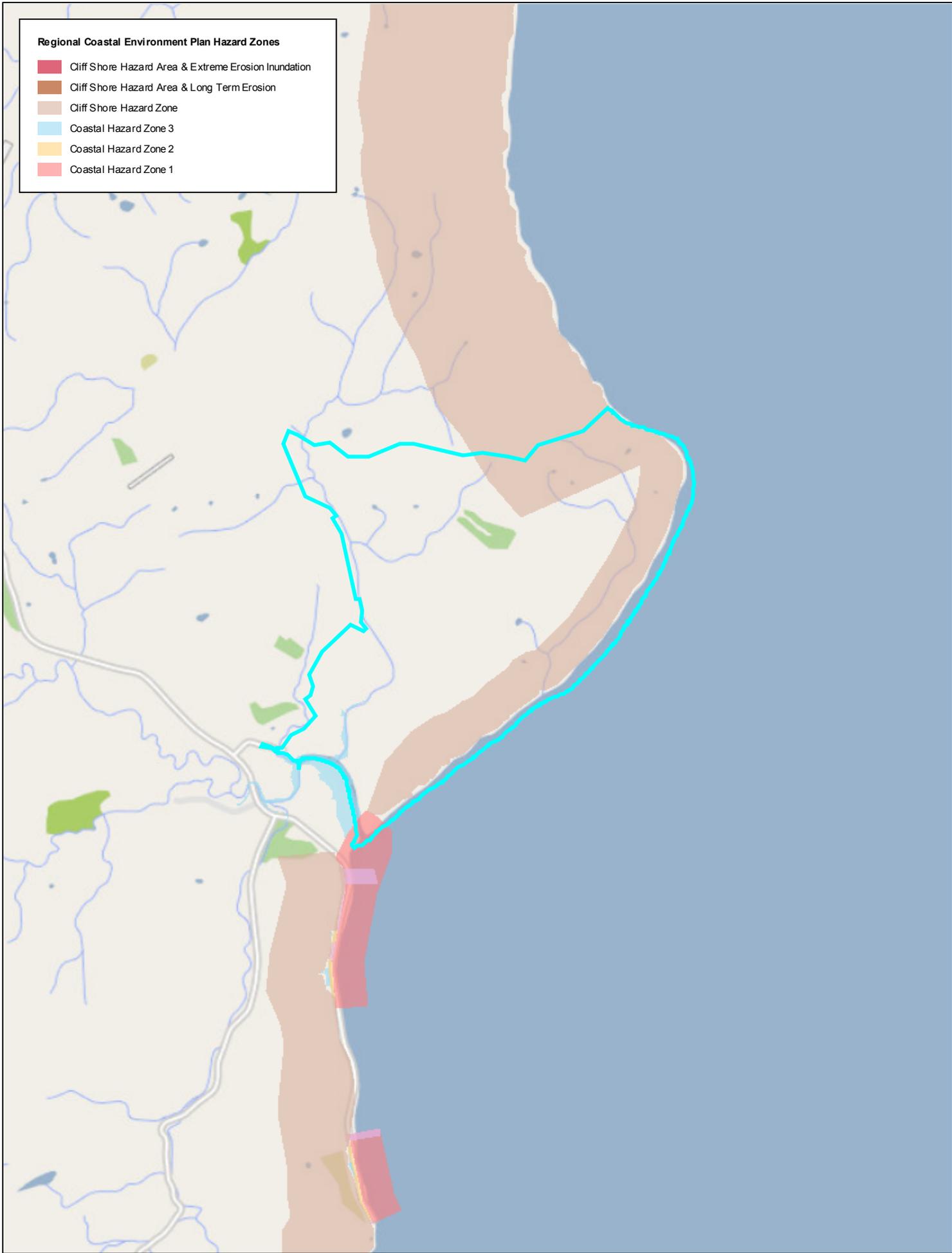
### REPORTS TO INFORM CHZs

The Regional Coastal Environmental Plan's CHZs have been based on a number of earlier technical assessments of coastal erosion and inundation. Many of those reports can be viewed on the HBRC's website:

<http://www.hbrc.govt.nz/hawkes-bay/coast/coastal-hazards/>

**Regional Coastal Environment Plan Hazard Zones**

- Cliff Shore Hazard Area & Extreme Erosion Inundation
- Cliff Shore Hazard Area & Long Term Erosion
- Cliff Shore Hazard Zone
- Coastal Hazard Zone 3
- Coastal Hazard Zone 2
- Coastal Hazard Zone 1



**Coastal Hazards Zones**  
(Regional Coastal Environmental Plan)

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### Tsunami Inundation

The East Coast of New Zealand has been identified with a significant tsunami risk because the Hikurangi subduction zone - New Zealand's largest fault, but we are also at risk of tsunami from distant and regional sources around the Pacific Ocean.

Map shows study areas divided into 2 coloured zones for tsunami inundation in a combination of worst case scenarios, up to a 2,500 year return period for Hawke's Bay, as follows:

1. Tsunami near source inundation extents (blue) - a tsunami coming from a near source, like very strong local earthquake
2. Tsunami distant source inundation extents (light blue hatch) - a tsunami coming from distant source across the Pacific Ocean, e.g. Peru

A more detailed map (Layer Name: Near Source Max Depth) between Tangoio & Clifton shows how deep the water may be after multiple tsunami waves in a 2000 year return period.

Risks in these areas include destruction of homes, businesses and infrastructure in inundation zones, along with injuries and loss of life, with environmental devastation and the slow process of recovery.

These inundation studies and road network maps are used to create the tsunami evacuation zones for the region which can be found here <https://www.hbemergency.govt.nz/hazards/tsunami/>

What can you do?

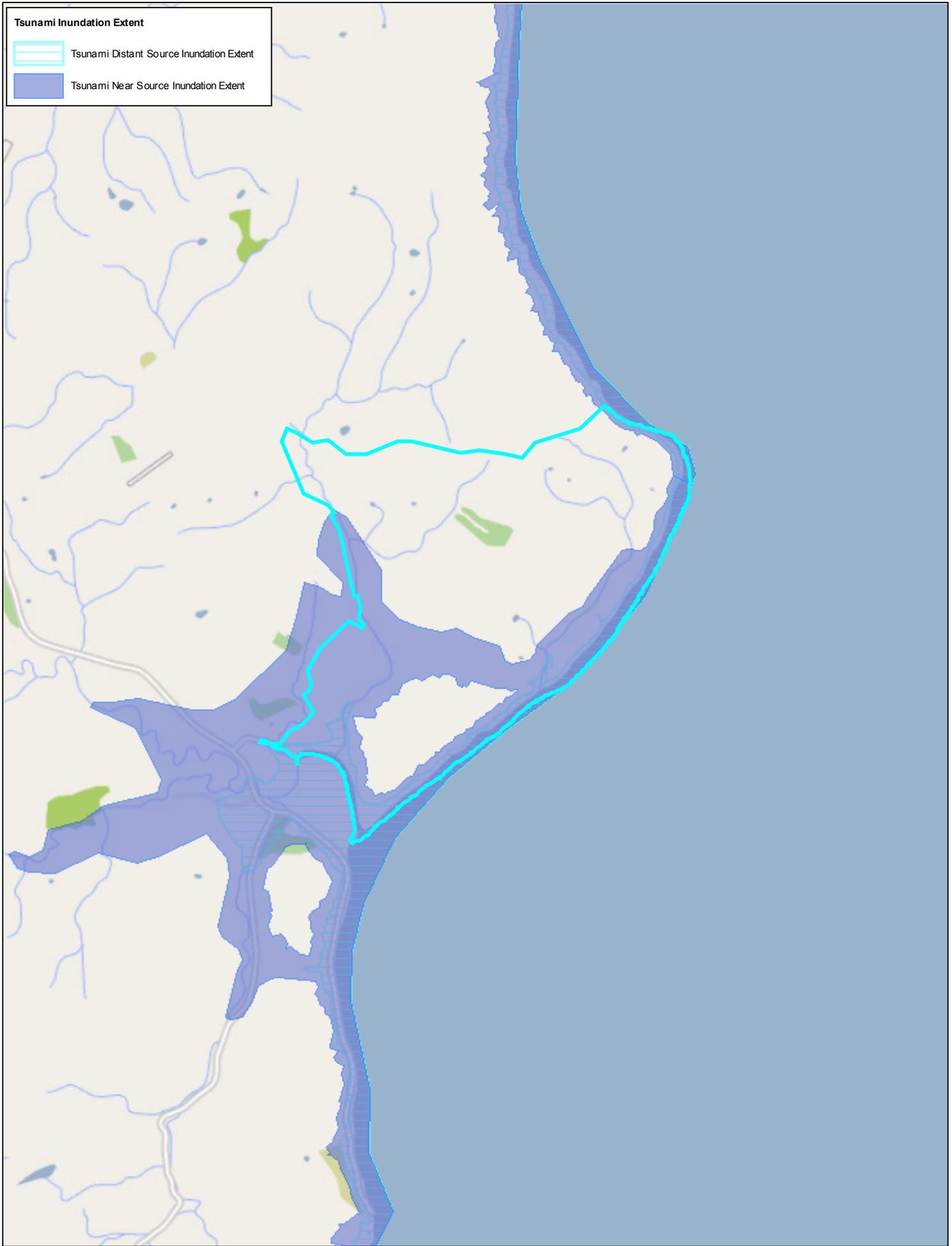
Most people in Hawke's Bay can survive a large tsunami if they self - evacuate in time. If you are developing land in a susceptible area, it is recommended you check tsunami evacuation zones, and develop your own tsunami evacuation route to work out if there is time to evacuate.

If you are already living in a tsunami evacuation zone, the easiest way to mitigate your tsunami risk is to ensure your insurance sum-insured is sufficient in the event of total loss. Then develop a tsunami evacuation route and if you feel a long or strong earthquake, drop, cover and hold for the earthquake, then self - evacuate. The first wave may arrive within 15 minutes so quickly get to a safe location - by foot or by bike. Leave immediately, every step counts. Go as fast as you can.

Remember, in the event of a tsunami the first wave is may not be the biggest. Wait for official 'All Clear' before returning.

**Tsunami Inundation Extent**

-  Tsunami Distant Source Inundation Extent
-  Tsunami Near Source Inundation Extent



**Tsunami Inundation Extents**

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### Landslide Risk

The Highly Erodible Land (HEL) layer describes land that is at risk of severe erosion. The data identifies five classes of land that are at risk of erosion: high landslide risk – delivery to stream; high landslide risk – non delivery to stream; moderate earthflow risk; severe earthflow risk; and gully risk. If land is protected with vegetation (i.e. indigenous forest, exotic forest, or scrub) then it is considered not at risk to severe landslide erosion, earthflow or gully erosion.

Landslide erosion is the shallow (approximately 1 m) failure of slopes that typically occurs during high rainfall events. Gully erosion is the large scale erosion that begins at gully heads and expands down hillsides over weeks to decadal time scales. Earthflow erosion is the slow movement of soil (approximately 1 m/year) downslope towards waterways. The HEL layer is derived from slope, land cover, and rock type.

Erosion can have several negative consequences on the environment including reduction in land productivity, reduction in water quality through increased nutrients and sedimentation, and loss of important infrastructure. Identifying areas that are at risk of severe erosion using the HEL layer is an effective method for informing and implementing land management decisions to reduce the effects of erosion and identifying areas at risk of land movement.

#### What can you do?

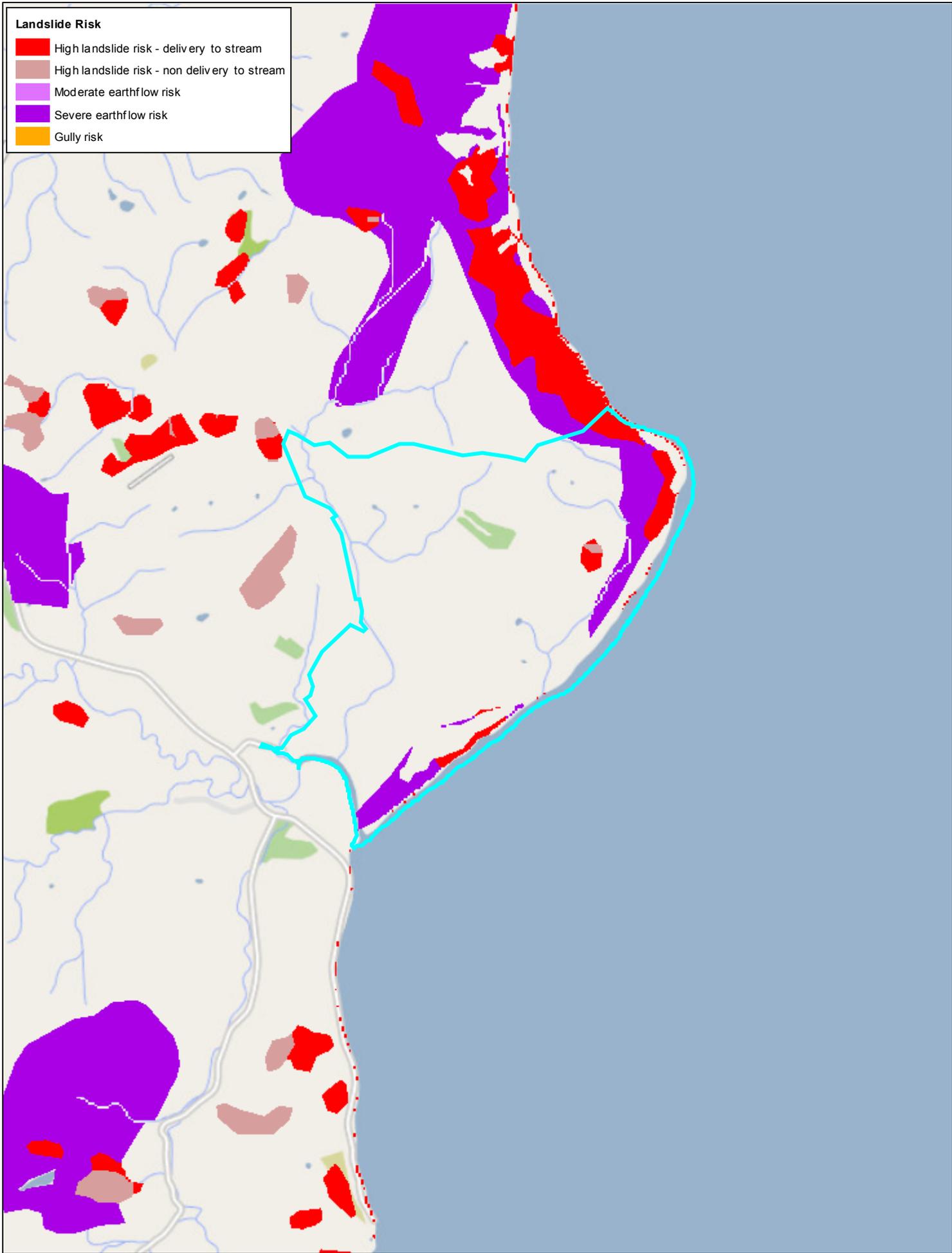
On a property already developed be aware of the risks of landslides on and around your property, and check your insurance cover. Check your property regularly, especially after earthquakes, long dry spells, or heavy rain fall. Look for signs of instability, such as building movement like sticking doors and windows, developing gaps, decks moving or tilting away from the house, new cracks or bulges on the ground, leaning trees or fences, slope movement, etc. Then fix the problem as quickly as possible, noting you may need to seek professional advice.

Hill country is prone to landslides, and farmers can get advice from the Hawke's Bay Regional Council about managing this risk such as erosion planting, planning of tracks and managing damaged areas. Tree cover significantly reduces soil erosion on steep country and can limit the amount of future damage.

If you are developing a property with landslide risks, seek professional advice before you start a project as this can greatly reduce the risk of having to take extensive remedial action later.

**Landslide Risk**

- High landslide risk - delivery to stream
- High landslide risk - non delivery to stream
- Moderate earthflow risk
- Severe earthflow risk
- Gully risk



**Landslide Risk**

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Wednesday, May 5, 2021

Original Sheet Size 210x297mm