



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

Hikurangi subduction zone

RESPONSE PLANNING TOOLBOX

TE WHAKAMAHERE
URUPARE A HIKURANGI

JULY 2020

Acknowledgements

This toolbox acknowledges the funding received from the National Emergency Management Agency (NEMA) -administered Resilience Fund, GNS scientists and input from other experts, the Hikurangi Response Planning project team and the East Coast Life at the Boundary Steering Group.

In addition, this toolbox acknowledges the valuable contribution of response planning outputs from the following initiatives, which have helped inform the content of this toolbox:

- SAFER South Island / Te Waipounamu Alpine Fault Earthquake Response Framework
- Wellington Earthquake National Initial Response Plan (WENIRP)
- Wellington Region Earthquake Plan (WREP)
- National and regional lifeline studies



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Introduction

The National Disaster Resilience Strategy (NEMA, 2019) seeks to identify and understand risk scenarios (including the components of hazard, exposure, vulnerability and capacity), and use this knowledge to inform decision-making. This toolbox seeks to build a greater understanding of a Hikurangi earthquake and tsunami risk scenario - to ultimately inform regional response planning and decision-making in response to this significant threat.

The toolbox has used a credible magnitude 8.9 earthquake and tsunami planning scenario, developed by GNS Science as a tool, to understand the consequences of a large Hikurangi event (detailed in Volume I, Appendix A). The toolbox and its planning outputs are not exclusive to the credible scenario but are intended to be scalable to a range of scenarios on the Hikurangi subduction zone.

The term ‘a large Hikurangi event’ is used in this toolbox to describe the credible scenario, and variations of this scenario, which would lead to a catastrophic disaster in Aotearoa New Zealand. Catastrophic disasters are widespread in their devastation, and defined as overwhelming the capacity of local communities, and local and national organisations to respond to an event (HBCDEM, 2019). This toolbox therefore seeks to provide a suite of resources to aid regional response planning to manage the consequences of such an event.

The toolbox has been primarily developed for the five Civil Defence Emergency Management (CDEM) Groups likely to be the first and most impacted by a large Hikurangi event (Figure 1.0). These Groups include:

- **Bay of Plenty CDEM Group**

- Bay of Plenty Regional Council
- Kawerau District Council
- Ōpōtiki District Council
- Rotorua Lakes Council
- Tauranga City Council
- Western Bay of Plenty District Council
- Whakatāne District Council

- **Tairāwhiti (Gisborne) CDEM Group**

- Gisborne District Council

- **Hawke’s Bay CDEM Group**

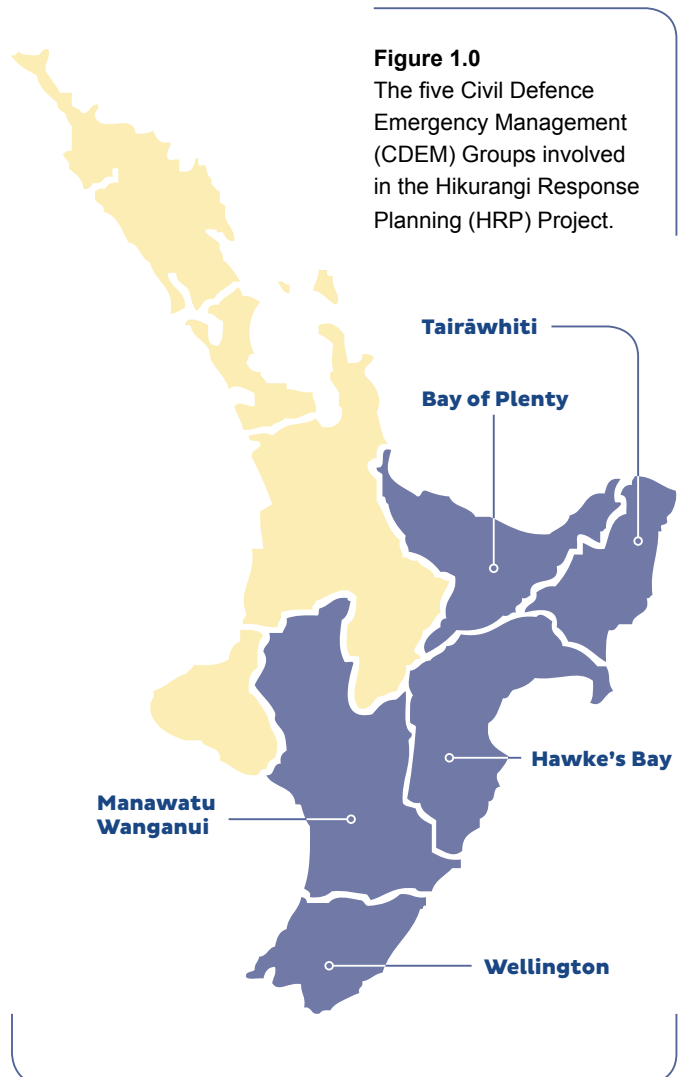
- Hawke’s Bay Regional Council
- Napier City Council
- Central Hawke’s Bay District Council
- Hastings District Council
- Wairoa District Council

- **Manawatū-Wanganui CDEM Group**

- Horizons Regional Council
- Palmerston North City Council
- Horowhenua District Council
- Manawatū District Council
- Rangitikei District Council
- Ruapehu District Council
- Tararua District Council
- Whanganui District Council

- **Wellington CDEM Group**

- Greater Wellington Regional Council
- Wellington City Council
- Hutt City Council
- Porirua City Council
- Upper Hutt City Council
- Kāpiti Coast District Council
- Masterton District Council
- Carterton District Council
- South Wairarapa District Council



The consequences of a large Hikurangi event will stretch wider than one CDEM Group's boundaries. This toolbox therefore seeks to encourage inter-regional planning where appropriate to enhance the effectiveness of response to a large Hikurangi event. Although developed for the five CDEM Groups above, the content in this toolbox is applicable and adaptable to all CDEM Groups, response agencies, organisations and communities in Aotearoa, New Zealand at risk from a large Hikurangi event.

Two volumes are included in the toolbox, outlining the risk posed by the Hikurangi subduction zone and regional response planning considerations. The Regional Response Concept Papers (Annex A) provide further detail regarding how the five CDEM Groups (Figure 1.0) involved in the development of this toolbox may respond to a large Hikurangi event.

Scope

Consideration of the impacts and consequences of a credible magnitude 8.9 Hikurangi subduction zone earthquake and tsunami planning scenario on the five CDEM Groups (Figure 1.0) involved in the Hikurangi Response Planning Project is in scope for this project.

Due to the impact of a large Hikurangi event on *all* of Aotearoa New Zealand, the toolbox does consider that other CDEM Groups may not be able to support the five CDEM Groups involved in the development of this toolbox. The toolbox does not consider likely impacts on, or response arrangements in CDEM Groups not included in the Hikurangi Response Planning project.

CDEM Groups not involved in the development of this toolbox are encouraged to use this toolbox, where applicable, to develop their own regional response plans for this event.

The toolbox is not a national plan, nor an all of New Zealand plan or a multi-agency plan. The toolbox does not seek to task regional and national responding agencies with specific response actions. Responding agencies have helped in the development of this toolbox, however responding agencies are expected to develop, or already have in place, plans specific to their areas of expertise in relation to a large Hikurangi event.

Economic impacts and recovery were considered as part of toolbox development but detailed recovery planning is not included in the toolbox. Social requirements arising from the scenario consequences, community consequences and animal welfare were considered and are included in the toolbox.

Audience

This toolbox has been designed primarily for CDEM Groups in New Zealand, with the purpose of informing regional response planning for a large Hikurangi event.

With adaptation, resources within this toolbox are also applicable to:

- CDEM Group partner organisations
- The National Emergency Management Agency (NEMA) and the National Crisis Management Centre (NCCM)
- Central Government agencies (including all emergency services, the New Zealand Defence Force (NZDF), health and disability services, welfare service agencies, and transport, energy and telecommunications regulating agencies involved in the response).
- Tangata whenua
- Crown owned entities
- Lifeline utilities (particularly national service providers serving more than one CDEM Group area and the FMCG sector)
- Private sector organisations involved in response and recovery
- Non-government organisations (NGOs) involved in the response and recovery
- All science research entities (including Crown Research Institutes (CRIs) and universities with interests or intention to be involved in, support or study community and managed responses to a large Hikurangi event).

Geographical Context

A large Hikurangi event would impact all of New Zealand and equate to a catastrophic disaster.

Although the Hikurangi Response Planning project was scoped to the five CDEM Groups shown in Figure 1.0, it is important to recognise the national organisational, social, cultural, environmental and economic context of a large Hikurangi event.

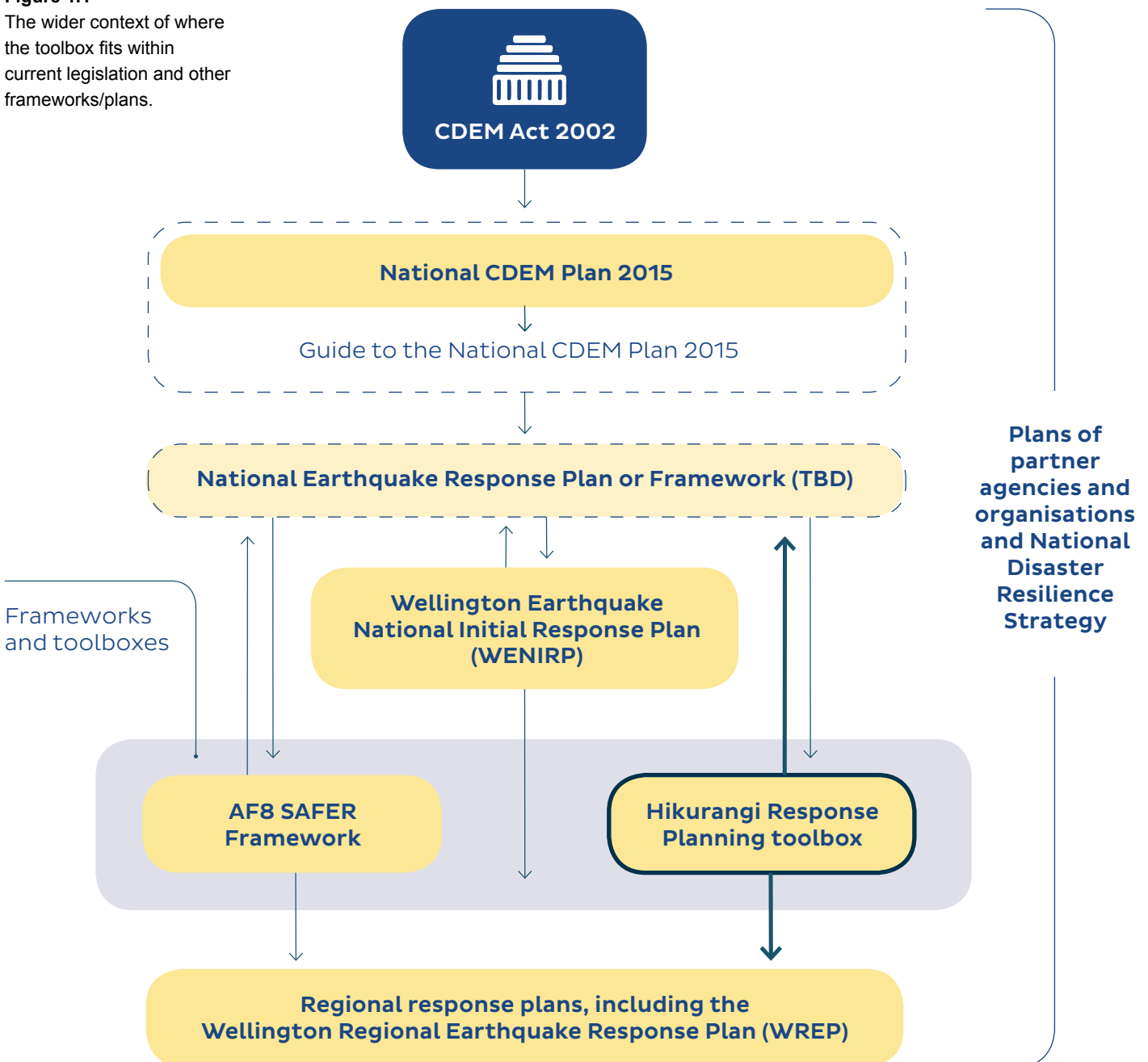
In addition, CDEM Group boundaries have proved to be an effective method of developing the toolbox by constraining the scope of the project. However these boundaries do not accurately reflect the interconnected and interdependent nature of services, agencies, people, communities and infrastructure which operate across these boundaries and would be affected by a large Hikurangi event.

Legislative Context

The Civil Defence Emergency Management (CDEM) Act 2002 and National CDEM Plan 2015 govern emergency response in Aotearoa, New Zealand and have informed the content of the toolbox (Figure 1.1).

This toolbox, the AF8 SAFER Framework and plans of partner agencies provide a link between these legislative and national documents with CDEM Group statutory plans, arrangements and operational procedures.

Figure 1.1
 The wider context of where the toolbox fits within current legislation and other frameworks/plans.





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HIKURANGI RESPONSE PLANNING

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VOLUME ONE **RISK TOOLBOX**

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July 2020

1.0 Hazard

The Hikurangi subduction zone is located off the east coast of Aotearoa, New Zealand, stretching offshore from Gisborne in the North Island to Kaikōura in the South Island (Figure 1.0). The Hikurangi subduction zone is one part of a longer tectonic plate boundary between the Australian and Pacific tectonic plates. The megathrust fault along the top of the subducting plate zone is Aotearoa New Zealand's largest and most active fault. Connecting the Hikurangi subduction zone with the Puysegur subduction zone below the South Island is a transform fault boundary, the Alpine Fault. In between the Hikurangi subduction zone and Alpine fault is a broad area of complex active faults, called the Marlborough Fault System. North of the Hikurangi subduction zone the plate interface continues, marked on the diagram below as the Kermadec trench.

Subduction zones are known for producing the largest earthquakes in the world. The most recent large subduction zone event above magnitude 9 occurred on the Japan Trench in 2011, east of mainland Japan (referred to as the 2011 Tōhoku event). This was a magnitude 9.1 earthquake and it created a large and devastating tsunami. This earthquake and tsunami event was described by Prime Minister Yoshihiko Noda as, "triggering the starkest crisis [Japan] has faced in a generation" (Washington Post, 2012). The 2011 Tōhoku event resulted in approximately 20,000 fatalities or missing people, and over \$210 billion in economic damage (The World Bank, 2014).

“He waka eke noa: we are all in this together”

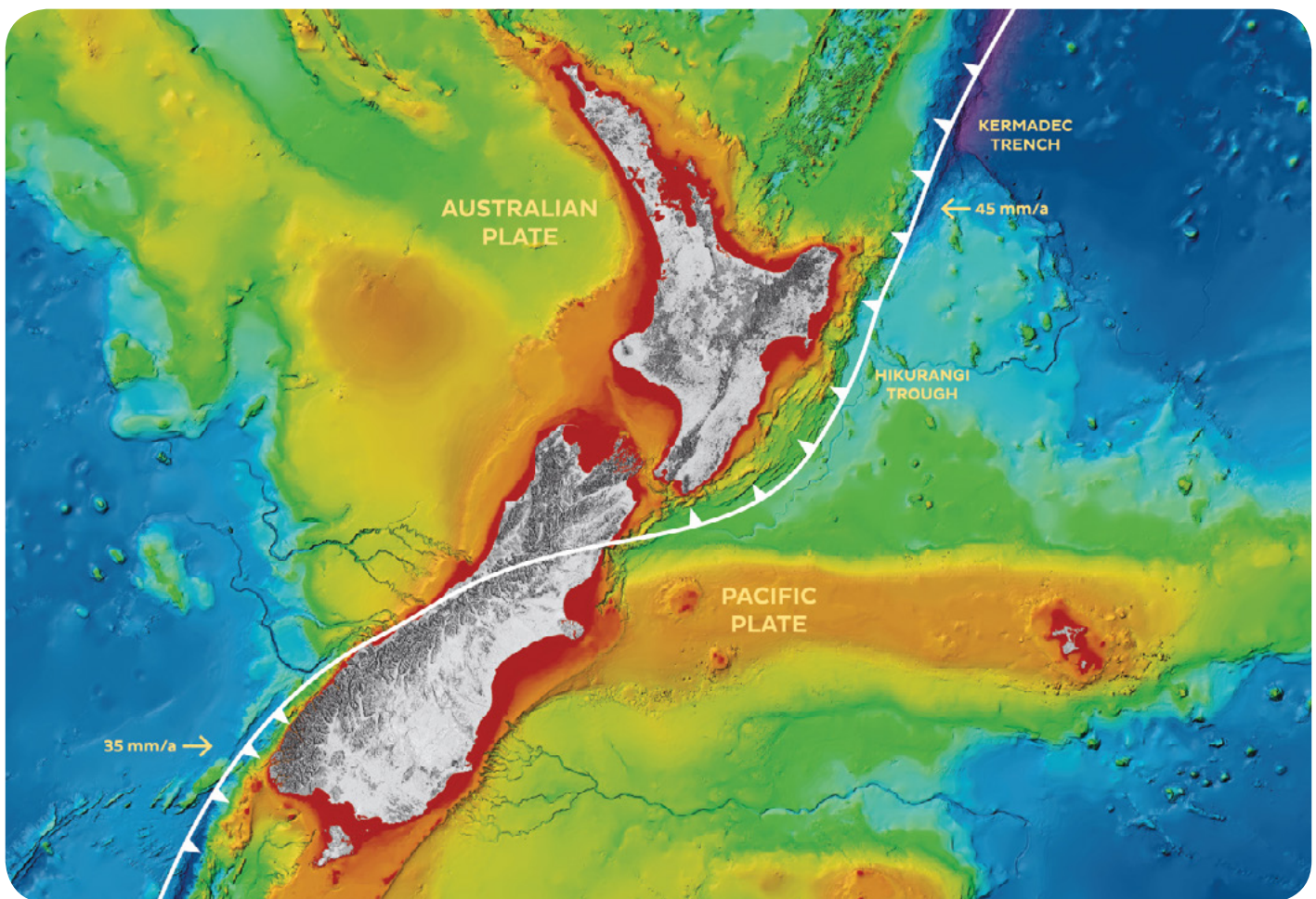


Figure 1.0
 The Hikurangi subduction zone (marked as 'Trough').

1.2 Likelihood

The record of historic earthquakes and tsunami generated by the Hikurangi subduction zone is relatively poorly constrained when compared to the record of Alpine Fault ruptures, where the paleoseismic record is long and accessible. This allows more accurate average return periods to be calculated.

Despite this, scientists know the Hikurangi subduction zone can produce large earthquakes and tsunami, and that these events have occurred in the past.

In a recent review of evidence for past Hikurangi subduction zone earthquakes and tsunami, Clark et al. (2019) concluded:

- The most recent geological evidence tells us that the last earthquake with a significant rupture (i.e. from Cook Strait to near Gisborne) was about 800-900 years ago, and probably had a magnitude between 8 and 9.
- In total, there have been 6 to 10 large Hikurangi subduction zone earthquakes over the last 7000 years.
- The most recent subduction earthquake was about 500 years ago, and it appears to have mostly impacted the southern part of the subduction zone (Wellington and Wairarapa).
- Earthquakes (above magnitude 7.0) that affect parts (but not all) of the east coast of Aotearoa New Zealand have recurrence intervals which vary from 350 to 1700 years.

Geological evidence is not precise enough to give us the recurrence interval of the credible magnitude 8.9 scenario used as a planning tool for this toolbox.

1.3 Vulnerability

It is estimated 65 per cent of New Zealanders live within five kilometres of the ocean (LGNZ, 2019).

More specifically, a national-scale coastal exposure assessment by NIWA for the Parliamentary Commissioner for the Environment (PCE) for coastal land no more than 3 metres above spring high tide (based on the 2013 Census), found the proportions of normally resident populations in these low-lying areas in the regions were: 12% for Bay of Plenty (31,000); 11% for Tairāwhiti-Gisborne (4,600); 29% for Hawke's Bay (43,000); and 7% for Wellington (33,500), covering areas where LiDAR topographic surveys were available (Bell et al., 2015). Note no data was available for Manawatū-Whanganui, these totals only cover occupants where people reside (i.e. not at work, schools or visitors), and that tsunami runup may extend above 3 m elevation in

some areas and therefore expose more of the population (tsunami runup is the maximum vertical height onshore above sea level reached by a tsunami).

The location of large populations near the coast increases vulnerability to large tsunami because issues such as traffic congestion (both foot-based and vehicle based) during tsunami evacuations becomes more prevalent and problematic.

Problems with traffic congestion and bottlenecks and during evacuation were observed during the 2004 Indian Ocean tsunami* and 2011 Tōhoku tsunami* (Mas et al. 2015), and mitigation work in a Aotearoa New Zealand context, for example using agent-based modelling (Power et al., 2019), is currently underway to address this. These large populations also require critical infrastructure and engineering lifelines to be located in coastal areas to support them, exposing some of this infrastructure to tsunami inundation.

In addition to low-lying coastal populations, Aotearoa New Zealand has not yet experienced a catastrophic disaster in living memory. Public memory is important, as evidenced after the Christchurch Earthquakes in 2011 and Kaikōura-Hurunui earthquakes in 2016, where preparedness levels for natural hazards were seen to increase across the country and then quickly stall, as public memory of the events faded (NEMA Disaster Preparedness Survey, 2019). Without having experienced a large Hikurangi event in living memory, New Zealanders may have increased vulnerability to this significant hazard.

*It is important when comparing events to note the differences in population density, economy and hazard preparedness between countries such as Japan, Indonesia and New Zealand, which can result in different hazard impacts.

1.4 Consequences

The potential consequences of the credible planning scenario would span across the social, built, natural and economic environments and a non-exhaustive list of consequences, intended as a guide, is provided below. Please note that injury, fatality and building damage figures are modelled estimates only.

These possible consequences are explored in further detail in Volume II of the Hikurangi Response Planning toolbox and within the Regional Response Concept Paper Annex.

Social environment:

- 100 -1000s of fatalities
- 1000s -10,000s of injuries
- 10,000s of displaced persons and animals
- Significant, and in some cases, long-lasting psychosocial impacts
- Significant demand for welfare support
- Significant long-term demands on responding agency staff (incl. CDEM staff).

Built environment:

- 10,000s of damaged buildings, some of which will be irreparable
- Significant disruption, and in the worst affected areas irreparable damage, to engineering lifelines such as power, telecommunications, water, gas, and transport infrastructure
- Damaged, and in some cases uninhabitable, emergency coordination facilities.

Natural environment

- Landslides and rockfalls
- Liquefaction
- Disaster waste and debris
- Lateral spreading
- Release of contaminants/hazardous substances into ecosystems
- Subsidence or uplift of land
- Permanent coastal inundation in some areas of land subsidence.

Economic environment

- Disruption to agriculture and damage to cultivation land
- Damage to Central Business Districts (CBDs)
- Disrupted business operations and supply chains
- Tourism impacts
- Loss of individual livelihoods.

**Appendix A:
 The credible
 planning scenario**

The toolbox has been developed using a credible magnitude 8.9 earthquake and tsunami planning scenario as a tool. The scenario has been developed by GNS Science, to help identify the consequences of a large Hikurangi event (herein referred to as ‘the scenario’) (Power et al., 2018).

This appendix provides a high-level overview of the credible planning scenario, with detailed consequences and impacts described in Volume II and the Regional Response Concept Paper Annex.

Several variations of the credible scenario were developed by GNS Science but one scenario was selected to identify the consequences of a large Hikurangi event with stakeholders (see ‘Volume II: Planning Toolbox’ for consequences), detailed in the table below.

The credible planning scenario	
Time	9am, a school day in winter
Magnitude (Mw)	8.9
Location of slip concentration	Southern Wairarapa
Peak slip	~18 m (non-uniform slip)
Average slip	9-10 m

Scenario assumptions

The following assumptions were made during the development of the credible scenario (Power et al., 2018):

- The choice of a magnitude 8.9 earthquake was made to represent a realistic large earthquake covering the majority of the Hikurangi subduction zone. A magnitude 8.9 earthquake is slightly below the maximum plausible magnitude, currently thought to be approximately magnitude 9.0 (Power, 2013).
- The earthquake slip-distribution used was chosen from a set of randomly generated slip-distributions, previously developed for a study by the Earthquake Commission (Horspool et al., 2016).
- The slip-distribution chosen was one in which there was a strong concentration of earthquake slip at the southern end of the Hikurangi margin in the Wairarapa/ Cook Strait area because geodetic studies have indicated strong-coupling between the two sides of the plate boundary in this area. This indicates the potential for a large-slip deficit to be released in this region during a future earthquake.
- Inundation modelling assumes the tsunami occurs close to high tide (a background water level of 0.69m above MSL was assumed).

The earthquake

(see Power et al., 2018)

A credible, magnitude 8.9 earthquake generates extreme (MMI X) ground shaking along the east coast of Aotearoa New Zealand (Figure 1.1, Figure 1.2). The shaking is prolonged, with MMI 7 and above shaking lasting for minutes in places (Figure 1.1(b)).

Intense shaking of MMI 8.0-10.0 occurs along the east coast of the North Island between Wellington and East Cape; Marlborough and parts of the Central North Island experience shaking of MMI 8.0-9.0; and most of the rest of the North Island and northern South Island experience shaking above MMI 7.0. Between Mahia and East Cape the duration of intense shaking is very long, amplified by the thick sedimentary rock, with durations of severe ground shaking of more than 60 seconds. Aftershocks occur after the mainshock, further detailed in Appendix (B).

MMI Scale	
MM 7: Severe	General alarm. People experience difficulty standing. Furniture and appliances are shifted. Substantial damage to fragile or unsecured objects. A few weak buildings are damaged.
MM 8: Extreme	Alarm may approach panic. A few buildings are damaged and some weak buildings are destroyed.
MM 9: Extreme	Some buildings are damaged and many weak buildings are destroyed.
MM 10: Extreme	Many buildings are damaged and most weak buildings are destroyed.
MM 11: Extreme	Most buildings are damaged and many buildings are destroyed.
MM 12: Extreme	All buildings are damaged and most buildings are destroyed.

Figure 1.2
 The Modified Mercalli Intensity scale definitions (MMI Scale)
 (GeoNet)

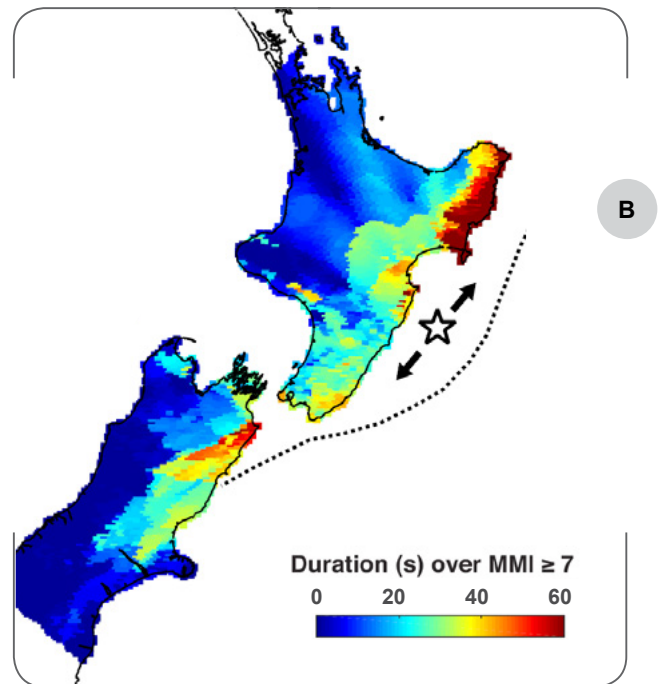
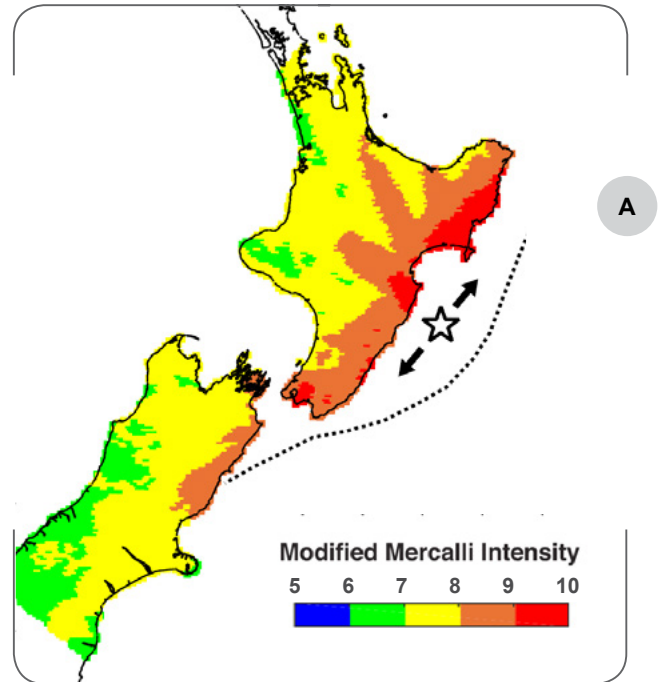


Figure 1.1
 Maps from Power et al. (2018) showing:
 (A) Modified Mercalli intensity (MMI) of the Mw 8.9 earthquake
 (B) Duration (s) of shaking over MMI 7.

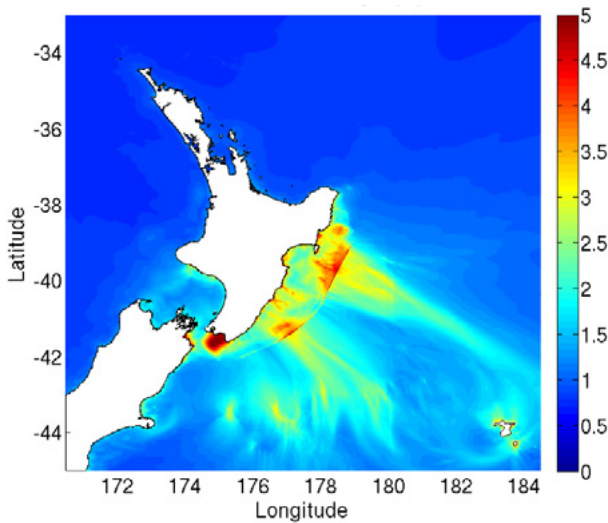
The tsunami

(see Power et al., 2018)

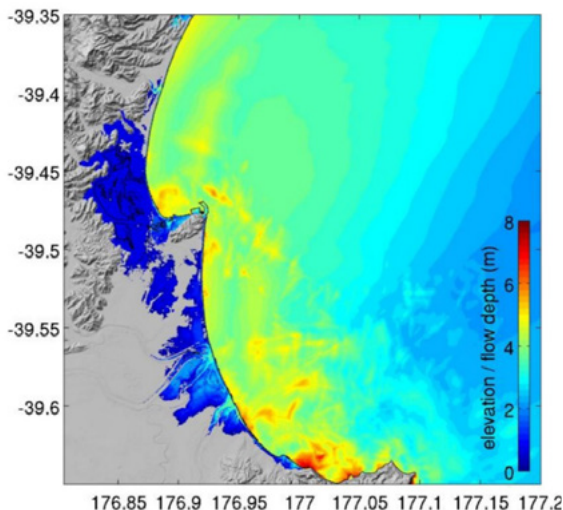
The offshore magnitude 8.9 earthquake initiates a large tsunami, due to displacement of the seafloor. Deep water wave heights and detailed tsunami inundation modelling are displayed in Figure 1.3. Wave heights will significantly increase as the tsunami shoals when approaching the shoreline.

Tsunami will be an ongoing hazard as multiple waves will arrive – the first wave will not necessarily be the largest. Tsunami will represent an ongoing challenge for the initial response, reducing access to large portions of the coastline damaged by the initial earthquake. Earthquake aftershocks (refer to Appendix B) may also bring risk of further tsunami, dependent on the degree of seafloor displacement which depends on the aftershock's magnitude and location.

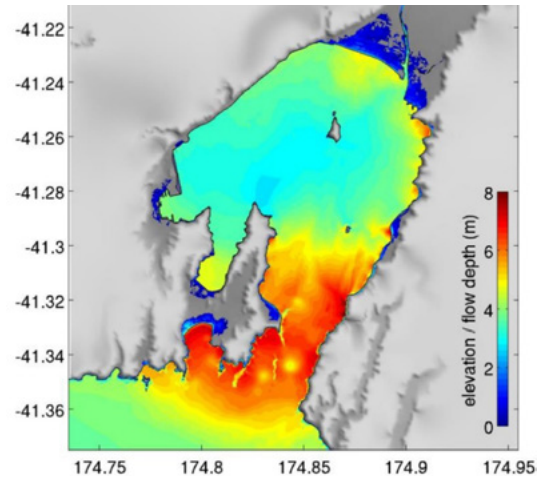
A Maximum water height (m)



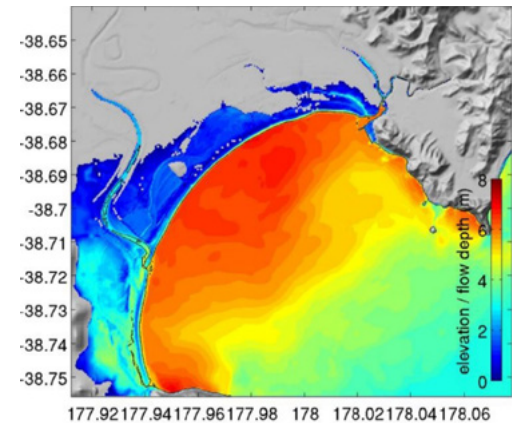
B Maximum flow depth: Napier



C Maximum flow depth: Wellington



D Maximum flow depth: Gisborne



E Maximum flow depth: Tauranga

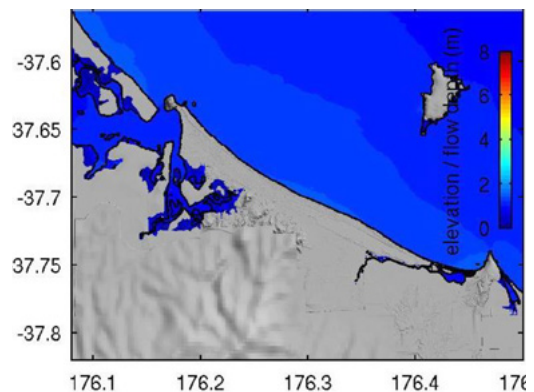


Figure 1.3 (Figures from Power et al. 2018)

(a) Maximum water surface elevation for the Mw 8.9 Hikurangi subduction zone credible scenario. The colour scale is limited so that water heights above 5m appear as 5m. Maximum flow depth (height of water above ground level) for (b) Napier, (c) Wellington, (d) Gisborne, (e) Tauranga.

Other secondary hazards

The following secondary and compounding hazards have been identified for the credible scenario but this list is not exhaustive. Secondary and compounding risks will complicate initial response activities and reduce the mobility of responders in the regions most affected. Any adverse weather concurrent with the earthquake will further complicate response and search and rescue activities.



Earthquake Aftershocks (Refer to Appendix B)

Aftershocks will occur for a prolonged period following the initial earthquake. Aftershocks may lead to further landsliding, uplift/subsidence, liquefaction, tsunami and lateral spreading. Building and asset inspection may need to be repeated following large aftershocks. Ongoing aftershocks may impact the psychological wellbeing of people affected.



Uplift / subsidence

Significant uplift/subsidence will occur in places, particularly the North Island's east coast, which will change the landscape. People, ecosystems, infrastructure and assets will be vulnerable as the landscape changes and adapts to its new equilibrium. An altered landscape from subsidence/uplift may become more susceptible to other hazards, e.g. heightened liquefaction exposure where subsidence has occurred. In addition, land subsidence in low-lying coastal areas may result in these areas having increased flood risk and becoming frequently or permanently flooded by high tides and/or storm tides, presenting additional ongoing vulnerabilities.



Liquefaction

Liquefaction will be a significant secondary hazard, enhanced by changes to the ground-water table due to land subsidence where it occurs, and will impact the efficiency of responding agencies travelling within and between regions. Liquefaction may also pose a hazard for people trying to evacuate.



Infrastructure Damage

Infrastructure may be destabilised or damaged by the initial earthquake and subsequent aftershocks. If subsidence has occurred in low-lying areas, there is also potential for ongoing coastal flooding. Un-reinforced masonry, tilt slab concrete features, bridge approaches, flood protection structures and embankments will be particularly at risk of damage/collapse.



Landslides

Following the initial earthquake and any subsequent aftershocks, landslides and rockfalls will be extensive, particularly in steep terrain. Slopes will become unstable, vulnerable to further landsliding. Landslides may isolate communities for significant periods of time and will pose a threat to people, buildings and assets. Tertiary hazards may occur, where landslides dams water bodies/courses, increasing the vulnerability of downstream communities to flash flooding. It is envisaged a significant amount of slope stabilization work will be needed during the response and recovery phase.



Communicable Human Diseases

Lack of sanitation, potable water contamination and delays in medical treatment may lead to transmission of diseases such as gastroenteritis, placing further pressure on the health system. Disease may spread rapidly where there is a lack of sanitation or concentrations of displaced people in emergency accommodation.



Disaster Waste/debris

Following the initial earthquake, tsunami inundation may severely damage buildings in inundation zones and distribute large amounts of debris further complicating response and recovery operations. Tsunami debris may be contaminated with hazardous waste, therefore the safe disposal of this will need to be addressed.

Appendix B: Aftershock sequence

To further understand the consequences of a large Hikurangi event, GNS Science modelled an aftershock sequence based on the credible magnitude 8.9 earthquake and tsunami scenario (Burbidge et al., 2019). For further details about the modelled aftershock sequence, readers are referred to Burbidge et al. (2019).

The modelling transferred the 2011 Tōhoku aftershock sequence onto the Hikurangi subduction zone and resized the size of magnitude of the mainshock and aftershocks to match the credible scenario (Figure 1.4).

Key findings from the Burbidge et al. (2019) modelling are:

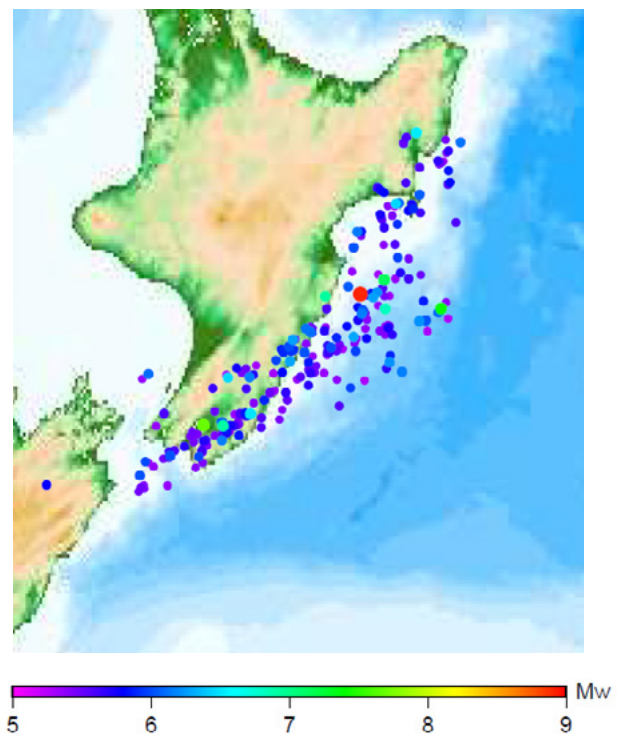
- Over the first year following the mainshock, the east coast of the North Island has close to 100% probability of experiencing shaking greater than MMI 6 from an aftershock.
- A year after the mainshock there is still a significant (about 50%) probability of an offshore magnitude 7 or greater earthquake over the following year. This will obviously have significant implications on the response and recovery efforts of affected regions.
- The magnitude 9.1 Tohoku earthquake was followed by three earthquakes above magnitude 7.0 in the first few hours. The modelled sequence placed a magnitude 7.7 aftershock underneath the Wellington region half an hour after the mainshock (Note, this is not a prediction of where the largest aftershock will always occur in a large Hikurangi event).

In terms of response planning, we should expect, and therefore plan, for aftershocks from a large Hikurangi event that will:

- Slow down self-evacuations following the mainshock,
- Slow or restart initial response efforts in some areas, e.g. emergency service personnel in tsunami evacuation zones are likely to have to repeatedly evacuate these areas every time there is a large aftershock, and,
- Create additional secondary hazards, e.g. new landslides, new tsunamis, and potential for further subsidence in low-lying areas.

Figure 1.4

Modelled aftershocks (above Mw 4.9) from the credible scenario using the 2011 Tōhoku aftershock sequence from Burbidge et al. (2019)



For further information

Please refer to the full aftershock study report (Referenced in Appendix A 'Reference Material').



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2.0 Introduction

A large Hikurangi event would result in a catastrophic disaster, requiring a level of response never seen before by Civil Defence and Emergency Management (CDEM) Groups in Aotearoa New Zealand.

A catastrophic disaster is defined as*:

- Having an extremely large physical and social impact on thousands of people across multiple regions
- Displacing large numbers of people for extended periods of time, if not permanently
- Causing widespread devastation across multiple regions, including significant damage to buildings and infrastructure such as transport, power, telecommunications and water networks
- Requiring support from major national and international resources and coordination in an extremely challenging environment
- Overwhelming the capacity of local communities and local and national organisations
- Presenting massive challenges to recovery and significant long-term effects.

*Definition from 'Rapid Disaster Relief: Responding to people's needs in catastrophe-how would New Zealand cope?' (HBCDEM, 2019)

This volume has been designed using the key learnings and planning outputs from the Hikurangi Response Planning project, with the aim of informing regional response planning in New Zealand CDEM Groups for this significant hazard.

A series of planning resource and tools are introduced in this volume for CDEM Groups to use as a starting point when conducting planning for a large Hikurangi event. Please note that as planning outputs have been generalised to suit most CDEM Groups, adaptation of the material is required to ensure it is fit for purpose, depending on CDEM Group arrangements and level of exposure to this hazard.

2.1 NCMC and ECC response relationships

In the event of a large Hikurangi earthquake and tsunami, CDEM Groups and the National Emergency Management Agency (NEMA) as lead agencies at the regional and national level respectively will activate their Coordination Centres to lead and coordinate the response.

Emergency Coordination Centres (ECCs) and/or Emergency Operations Centres (EOCs) within the five CDEM Groups will coordinate the multi-agency response within their regions. CDEM Groups in other areas may also activate ECCs and/or EOCs.

NEMA will activate the National Crisis Management Centre (NCMC) (in Wellington or its alternate site in Auckland) to coordinate the 'All of Government' (AOG) response. Further arrangements are detailed in the table below and in the Guide to the National CDEM Plan (2015).

It is assumed that a state of national emergency will be declared following a large Hikurangi subduction zone earthquake and tsunami due to the anticipated scale of impacts and the anticipated need for significant multi-agency coordination of regional and national resources under the CDEM Act 2002. Ultimately, this is the decision of the Minister of Civil Defence, on the advice of the National Controller and/or Director of Civil Defence Emergency Management.

Due to its proximity to the subduction zone, the Wellington region may be significantly impacted by the earthquake and tsunami. This is likely to impact the ability of government to make an immediate national declaration, and may mean regions need to declare states of local emergency to exercise emergency powers so they can begin to respond appropriately to the impacts of a large Hikurangi event.

If a state of national emergency is declared over a region with a state of local emergency in place that state of local emergency will cease to have effect (section 66(3) of the CDEM Act 2002). However, in this scenario CDEM Groups and CDEM Group Controllers retain their powers and responsibilities within the priorities set by the National Controller.

To ensure resources are allocated in an effective, timely manner if the NCMC does not hear from, or cannot establish contact with CDEM Groups, it is recommended CDEM Groups pre-determine and communicate response priorities and resource requirements as a contingency measure during readiness.

CDEM Group ECC and NCMC Arrangements	
Before a state of national emergency declared	<ul style="list-style-type: none"> • Group controllers are in control of the response within their regions. • The NCMC will work to the priorities of Group Controllers. • The NCMC will coordinate the national response including priorities and deconfliction of national response activities. • Resources assigned to Groups by the NCMC to achieve an effect within Group boundaries will remain under the control of the Group Controller. • Resources assigned by the NCMC to achieve an effect across Group boundaries will remain under the control of the National Controller (e.g. NZDF air reconnaissance assets). The support agency providing the resource retains command of their resource in any situation.
After a state of national emergency declared	<ul style="list-style-type: none"> • Group Controllers are in control of the response within their regions. • The National Crisis Management Centre (NCMC) will direct the overall response including de-conflicting and prioritising national response activities. • All agencies and CDEM Group Controllers will be working to the priorities of the National Controller. • Resources assigned to Groups by the NCMC to achieve an effect within Group boundaries will remain under the control of the Group Controller. • Resources assigned by the NCMC to achieve an effect across Group boundaries will remain under the control of the National Controller (e.g. NZDF air reconnaissance assets). The support agency providing the resource retains command of their resource in any situation.

Readiness Recommendation:

To facilitate a quick local declaration, it is recommended each CDEM Group consider who can do this for the region and ensure there are redundancies in place for contacting them as part of readiness. This may include having pre-arranged plans to ensure governance is present in any response (e.g. pre-arranged transport to the response centre).

2.2 Legislative enablers

Assuming a state of national or local emergency is in place, the CDEM Act 2002 will be the key piece of legislation used in response to a large Hikurangi event.

The declaration of either a local or national state of emergency and the powers available within the CDEM Act 2002 will enable Groups to conduct an appropriate response.

It is critical to the success of any response that the procedures for a local declaration are well known and practiced, and contingencies are in place for conducting the process in adverse circumstances if a national declaration is not in place.

Responding agencies have their own powers available under their respective legislation which may be used both before and during a state of emergency. This legislation includes the:

- Fire and Emergency Act 2017
- Policing Act 2008
- Building Act 2004
- Health Act 1956
- Land Transport Management Act 2003 (and other relevant Transport Acts), and
- Resource Management Act 1991

Regardless of a state of emergency being in force, response activities by supporting agencies should be undertaken with the powers available under their own legislation in the first instance and use powers under the CDEM Act 2002 when those existing powers are inadequate. Coordination at an early stage will be critical to enabling this to happen.

Regardless of whether or not a State of Emergency has been declared, the response must still adhere to the provisions of the Health and Safety at Work Act 2015.

While there may be circumstances where appropriate risk assessment can be used to reduce potential harm to responders, emergency services and defence personnel should be involved in response planning to ensure risk to operational capabilities is minimized to the extent possible while fulfilling operational response requirements.

2.3 Inter-regional planning and coordination

2.3.1 Coordination beyond Group boundaries

Following a large Hikurangi event it is likely that some CDEM Groups may not have the capacity or capability to coordinate the response in one or more of their communities, requiring another CDEM Group with the capability and capacity to help by coordinating beyond its boundaries, for example, where a physical barrier, such as a landslide, may be isolating a community. Coordination across boundaries may also be necessary to achieve an effect, e.g. reconnaissance of an asset.

The decision for a CDEM Group to coordinate the response in a community beyond its boundaries would be a joint decision between the two CDEM Groups involved and would be in consultation with the National Controller and appropriate stakeholders.

Additionally, it is important to note some agency boundaries, such as NZ Police and Fire and Emergency NZ (FENZ) regions, do not align to regional council boundaries. Engagement and response planning with these agencies therefore requires a coordinated approach between the CDEM Groups and the agencies involved.

Section 17(1)(f) of the CDEM Act 2002 encourages Groups to assist one another in the implementation of civil defence emergency management in their areas; a catastrophic disaster like a large Hikurangi event supports the merit of collective planning.

2.3.2 Other opportunities for inter-regional planning

Other opportunities for inter-regional planning include:

- Using private sector partnerships across CDEM Group boundaries.
- Supporting each other with consistent PIM messaging
- Understanding the priorities and interdependencies of lifeline restoration in neighbouring Groups to efficiently align resources during response.
- Development of consistent reporting metrics and response technology systems across CDEM Groups as part of readiness to enable resource prioritisation and ensure consistency.
- Identification of the complexity of response agency interdependencies across New Zealand.

Readiness Recommendation:

Where it is deemed likely that coordination beyond Group boundaries would be required following a large Hikurangi event, it is recommended that discussion of the implications of coordinating beyond boundaries occurs during readiness. This could take the form of cross-boundary memorandums of understanding (MOUs) or agreements between CDEM Groups.

As part of this process, it is recommended consideration is given to:

- Identification of likely isolated communities using a range of scenarios.
- Pre-identification of likely isolated communities using a range of scenarios.
- Contingency options if neither Group can help the other.
- The capacity and capability of a CDEM Group to care for another area or community.
- Delegations of authority and systems required to be in place (CDEM and financial).
- Training and exercising required to build capability and relationships between the CDEM Groups.
- The ability of the Group coordinating beyond its boundaries to maintain appropriate levels of staff resourcing.
- Conducting community response planning across CDEM Group boundaries, with likely isolated communities, which includes:
 - Preparedness actions the community can take to increase their resilience
 - Expectation management, i.e. they are likely to be isolated for a prolonged period
 - Proposed arrangements, i.e. that they may receive assistance from 'X' CDEM Group
 - A shared location between CDEM Groups for Community Resilience Plans to sit as part of readiness.

The requirement for national CDEM support and coordination should be identified and planned for where regions do not have the capability or capacity to meet response requirements themselves, or with direct coordination with adjacent regions.

2.4 Response outcomes

The following table lists key workstreams and response outcomes for a large Hikurangi event to aid the regional response planning process. Workstreams and response outcomes are adapted from the WENIRP, and with further adaptation may apply to other hazard or consequence-based planning undertaken by CDEM Groups in Aotearoa, New Zealand.

Workstream	Response outcome
Co-ordination command, control and communication	Co-ordination, command, control and communication structures and protocols are established as soon as possible for regional responding agencies and organisations.
Reconnaissance and information	Key decisions during response are supported and informed by good situational awareness including an understanding of the environment, situation, likely developments, and implications.
Rapid disaster relief and welfare service delivery	People are put at the centre of the emergency , to provide for the needs of affected people, prevent escalation of suffering and minimise the consequences of the emergency for individuals, families and whānau, and communities.
Operational response (Health, FENZ, NZ Police etc.)	Emergency and health services are enabled to minimise the consequences of the emergency for people, property and the environment as per their roles and responsibilities within the National CDEM Plan (2015)
Procurement of resources and services	Resource requirements not able to be fulfilled by the CDEM Group are quickly communicated to appropriate coordination facilities to enable the response and increase the speed at which the immediate and basic needs of those affected are met.

Workstream

Response outcome

Emergency supply chain and people movement

The emergency supply chain is re-established in an efficient manner within and between Group areas, to enable skilled personnel and resources to move in and between Groups, and the critically injured to leave Groups for health care where appropriate.

Lifelines utilities restoration

Lifeline utilities are supported to restore services they normally provide to the fullest possible extent during the response (even though this may be at a reduced level).

Public information management

Life safety advice and information is communicated in a way which results in positive outcomes for communities, is consistent with support agency messaging, and maintains public confidence in the response.

Environment

Environmental impacts and risks are prioritised appropriately within the response to minimise the consequences of the event on people and the environment.

Image: John Cowpland



2.5 Response planning considerations

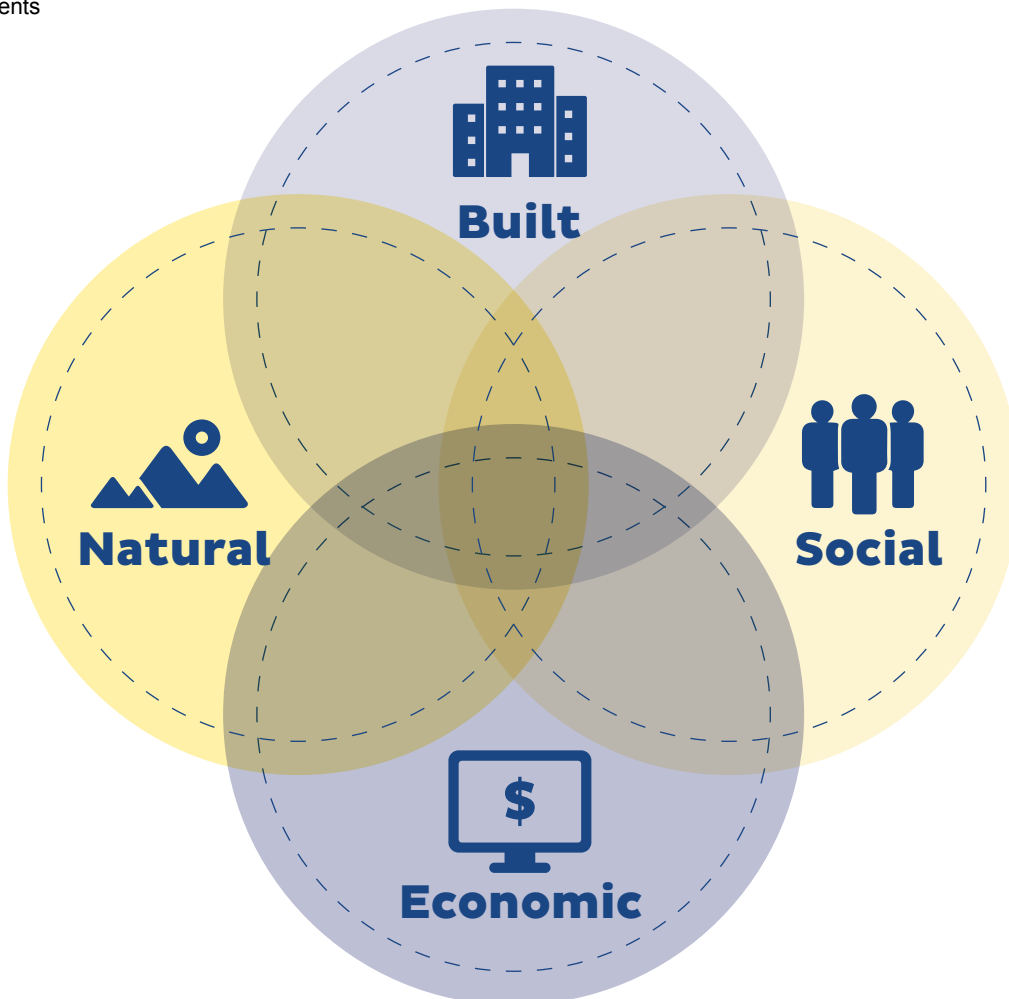
The following impacts, response planning considerations and recommendations have been developed using the learnings from the Hikurangi Response Planning project. They are designed to help inform the content of regional response plans.

As part of the initial stages of the CDEM response planning process, a Hazard & Environmental Assessment (HEA) is carried out. This is further explained in [DGL 19/15 Response Planning in CDEM](#) which explains the analysis process for the hazard and its consequences. Further support to this analytical process can be gained by applying the 'holistic consequence analysis' concept found in CIMS 3rd edition to ensure consideration is given to all aspects of the natural, built, social and economic environments.

Impacts are listed generically in the table below and are intended to be scalable, dependent on the risk the Hikurangi subduction zone poses to a CDEM Group area. Volume I, 'Risk Toolbox', can be used as a tool to help CDEM Groups determine the risk and likely impacts of a large Hikurangi event in their region.

In addition, impacts, planning considerations and planning recommendations are categorised to align to the four recovery and 'Holistic Consequence Analysis¹' environments - social, built, economic and natural (CIMS 3rd Edition). Although organised in separate tables, the four environments have many interdependencies and therefore should all be considered together rather than individually (Figure 2.0). Where necessary, some planning considerations have been expanded upon in Sections 2.5.6 - 2.5.10.

Figure 2.0
 The four environments



2.5.1
Planning considerations and
recommendations: social environment

Considerations	Recommendations
Injured persons	
<ul style="list-style-type: none"> ● The numbers of injured needing emergency care will place a large amount of pressure on health services in the worst affected Groups. ● There will be ongoing aftershocks and secondary hazards which increase the risk of further injury and complicate the rescue of those affected, e.g. if co-seismic subsidence occurs, then a further secondary hazard is permanent tidal flooding, which may complicate recovery of the injured. ● Where applicable, lack of power, potable water and telecommunications will make treating the injured more difficult. In some cases, this may worsen health outcomes for those affected. ● In addition to emergency health care for the injured, populations will still require core health service delivery, e.g. maternity services, elective/routine surgery, prescription refill, urgent daily OST for drug dependent individuals (methadone), laboratory services. ● Medical care facilities may also have low staff resource due to the event or damaged facilities affecting their ability to respond. 	<ul style="list-style-type: none"> ✓ Plan for stretched or overwhelmed health services. ✓ In the worst affected Groups, health services are likely to be overwhelmed. Lesser affected Groups may receive patients from worst affected Groups, possibly increasing pressure on their health services too. ✓ Expect disruption to core health services. ✓ Develop contingencies and continuity plans where health services may need to be delivered without power, potable water and telecommunications.
Fatalities	
<ul style="list-style-type: none"> ● In the worst affected Group areas the amount of fatalities is likely to overwhelm mortuary and Disaster Victim Identification (DVI) capacity. ● The mental health of responding agency staff may be affected by the number of fatalities (and injured) they respond to. ● Previously identified facilities for a mass fatality event may not be suitable for occupation/have their capacities exceeded following a large Hikurangi event. ● Lack of essential services, such as power, in some Groups may inhibit fatality management. ● Additional fatality management considerations include: <ul style="list-style-type: none"> ◦ Complex recovery within earthquake and tsunami debris ◦ The importance of following religious burial customs ◦ Repatriation of foreign nationals 	<ul style="list-style-type: none"> ✓ Depending on the risk posed to a Group area by the Hikurangi subduction zone, identify suitable transport, storage and burial arrangements to accommodate mass fatalities. Where applicable ensure alternate facilities are wired for, or have, generator capability and are in suitable locations (i.e. outside tsunami evacuation zones). ✓ Establish/maintain links to Inter-Faith Groups to advise on 'no go' religious actions with the deceased.

Considerations	Recommendations
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Displaced persons	
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<ul style="list-style-type: none"> ● Delays in meeting the immediate and basic needs of those who are displaced may lead to worsening health outcomes for those affected e.g. if emergency shelter is not provided in time, displaced persons are more susceptible to exposure related illnesses. ● Many people, including dependents and tourists, will become temporarily separated from their families and loved ones as a result of self-evacuation from tsunami evacuation zones. This may lead to vulnerable persons needs not being adequately met and significant psychological stress. ● Concentrations of people at emergency shelter/ accommodation during a time of stress may lead to safety or security issues regarding personal belongings and social interactions. ● Long-term displacement of communities may have adverse economic outcomes in the most affected regions (e.g. permanent or regular springtide flowing arising from co-seismic subsidence will permanently displace residents in low-lying coastal areas). 	<ul style="list-style-type: none"> ✓ Ensure CDC and volunteer staff are familiar with NZ Police reunification process. ✓ Conduct a high-level options analysis and scoping for mass emergency shelter and accommodation following a large Hikurangi event to inform the amount of domestic/international assistance required e.g. green spaces, businesses, warehouses. ✓ Consider safety and security arrangements required for mass emergency shelter and accommodation if applicable. ✓ As part of readiness emphasise the importance of the public practising tsunami evacuation routes and making a 'household plan' covering situations where family members become separated. ✓ Consider the public health implications of mass emergency shelter and accommodation in terms of potable water supply, sanitation and sewage disposal, public hygiene and refuse collection.
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Displaced animals	
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<ul style="list-style-type: none"> ● Many pets and livestock will be unintentionally abandoned due to self-evacuation and damaged enclosures. ● Damaged enclosures / stock loss would have a large economic impact on farmers livelihoods and the wider economy. ● Many animals will have ongoing requirements for shelter, food and water placing further pressure on welfare services. 	<ul style="list-style-type: none"> ✓ Provide training for response personnel who may be required to work around animals in a disaster (e.g. at pet friendly CDCs). ✓ Plan for evacuees sheltering with pets and/or establishing pet friendly spaces at emergency shelter and accommodation areas. ✓ Identify larger enclosures/options to accommodate large animals/farm stock if required. ✓ As part of readiness encourage the public to have emergency plans and supplies for their pets and/or livestock as well as their households.
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Considerations	Recommendations
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Demand on welfare services to meet basic needs	
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<ul style="list-style-type: none"> ● Demand on welfare services will continue to increase following the event as personal 'emergency preparedness' food, water and medical supplies are depleted, and unmet basic needs worsen health outcomes for communities. New vulnerable populations will be created, and, in some cases, pre-existing vulnerabilities exacerbated. ● There will be a large demand for basic and limited resources, such as water, food, shelter and fuel. Panic buying and looting may occur. Rationing of limited, critical resources may need to be considered depending on the impact of the event on the Group. ● There will be a long-term requirement for financial assistance where employees, employers and local economies have been affected/disrupted. 	<ul style="list-style-type: none"> ✓ Determine for a large Hikurangi event; <ul style="list-style-type: none"> a) Estimated quantities of rapid disaster relief resources (services, goods and equipment) (Rapid Disaster Relief expanded on in Section 2.5.6) b) A methodology for triaging communities within the Group to receive domestic and/or international assistance, and, c) Methods for delivering assistance to communities where there is likely to be limited accessibility. ✓ Establish MOUs/pre-agreements with regional private enterprises for the requisition and distribution of basic resources following a large Hikurangi event where applicable e.g. emergency shelter, private fuel supplies for emergency service (e.g. construction company holdings), water tankers etc. ✓ Obtain a regional picture of privately-owned fuel holdings that could provide an alternate supply. ✓ Consider the plans and procedures required in terms of safety and security for the rationing of critical basic resources in affected communities. ✓ Consider how the operation of privately-owned 'spontaneous' hubs which provide basic needs are safely managed during response, e.g. supermarkets, clothing shops. ✓ As part of readiness emphasise the importance of the public having sufficient emergency supplies.
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Large demands on responding agency staff (incl. CDEM staff)	
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<ul style="list-style-type: none"> ● Emergency response staff, and/or their families, may be directly affected by the event (mentally and/or physically) resulting in them being unable to respond. This will increase the pressure on response staff resourcing. ● Due to the scale of impact, emergency services and CDEM will experience high demand for their people and equipment to respond to the event. Even where a Group has been relatively unaffected, surge capacity from that Group may be required to support more affected areas. 	<ul style="list-style-type: none"> ✓ Plan for overwhelmed and under-staffed responding agencies. ✓ Where it is likely Group staff may have difficulty getting to ECC/EOCs, pre-define muster points so staff can be transported together using land or air assets available. ✓ Ensure EOC and ECC training is consistent across the Group to ensure continuity if a staff member is required to work at another EOC.
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2.5.2 Planning considerations and recommendations: built environment

Considerations	Recommendations
Damaged buildings	
<ul style="list-style-type: none"> • Many buildings and assets will become unsecured due to either damage from the earthquake and/or tsunami, or a lack of security following evacuation. • There will be thousands of damaged buildings following a large Hikurangi event that will require structural assessment before re-occupation. Some buildings may be permanently abandoned due to the amount of damage or as a result of coastal flooding from co-seismic subsidence. Due to the amount of buildings needing assessment, delays may cause people to re-occupy buildings before they are deemed safe. This may be to seek shelter or to because the building is deemed critical to enabling the response. 	<ul style="list-style-type: none"> ✓ Determine priorities for building assessment within the group and set up MOUs with building assessors to fast-track the process following a large Hikurangi event. ✓ Plan for a large demand on cordons (size and/or number) (Cordons expanded on in Section 2.5.8). ✓ Identify nationally significant infrastructure (e.g. FMCG) that may require prioritisation for damage assessment and response activities.
Damage to telecommunications	
<ul style="list-style-type: none"> • There will be increased reliance on alternative communications e.g. Satellite phone, VHF radio, HF radio. • Where telecommunications are not available, communication between Groups and to NEMA will be reliant on satellite phone. • Lack of power and telecommunications will inhibit the ability of PIM staff to convey warnings and information to the public. Alternative means will need to be utilised. 	<ul style="list-style-type: none"> ✓ Communicate alternate communications channels amongst regional responding agencies. ✓ Scope alternate methods of getting information to communities (e.g. use of noticeboards/scheduled public meetings). ✓ Create a database of responding agency alternate communications systems, satellite phone numbers, radio frequencies and compatibility of these systems. Test these systems regularly as part of readiness. ✓ Determine how to give the 'all clear' and other messages to communities who have evacuated following the initial earthquake and tsunami when power and communications are down (Public information management expanded on in Section 2.5.10). ✓ Work with regional responding agencies and lifelines groups to predetermine and refine the Group resource and information requirements for a large Hikurangi event and communicate these to NEMA as a contingency in case of damaged telecommunications following the event. ✓ Working with lifelines groups to pre-determine regional lifeline restoration priorities for a large Hikurangi event. Work with other CDEM Groups and lifeline agencies where lifeline agencies cross CDEM boundaries to understand cross-boundary restoration priorities to enable efficient alignment of resources during a response. ✓ As part of readiness emphasise the importance of the public having sufficient emergency supplies for emergencies. ✓ Identify nationally significant infrastructure (e.g. lifelines) that may require prioritisation for damage assessment and response activities ✓ Identify aerial reconnaissance requirements to assess damage to the built environment (e.g. roads, power, bridges, key lifeline installations).

Considerations	Recommendations
Damage to power networks	
<ul style="list-style-type: none"> ● It is likely power networks will be damaged in many regions. The National Vulnerability Assessment (Stage 1) cites electricity as the most critical service for the normal operation of most other lifelines. It is needed for refining and distributing fuel and gas, treating and distributing water, operating telecommunications networks, ports, railways and many other lifelines. ● Loss of power in winter may lead to an increase in exposure-related illnesses. ● It is unlikely electronic purchasing and banking will be available during the response in the affected Group areas. This will impact affected populations, particularly those who rely on regular support payments to meet their household's basic needs. 	<ul style="list-style-type: none"> ✓ Plan to initially respond without power and identify the regional interdependencies relevant to this impact, e.g. the reliance of telecommunications, water treatment plants, pumps (for water and fuel) on electricity or a form of power (e.g. fuel powered generators) to function. ✓ Ensure coordination centres have hardcopy backups of templates, manuals and procedures (including the NEMA consistent messages guide). ✓ Ensure essential regional coordination facilities have, or are wired for, back-up power generators to enable coordination to continue without power. ✓ Expect an increase in the amount of financial support required by communities. ✓ As part of readiness emphasise the importance of the public having sufficient emergency supplies for emergencies.
Damage to three waters	
<ul style="list-style-type: none"> ● Damage to potable and non-potable water supplies may worsen community health outcomes due to lack of drinking water and the potential spread of disease from lack of sanitation facilities e.g. gastroenteritis. ● Damage to sewerage pipes may adversely affect the environment and be a human and animal health hazard. 	<ul style="list-style-type: none"> ✓ As part of rapid disaster relief, consider how to provide clean water to communities during response (See Section 2.5.6 for more information). ✓ As part of readiness emphasise the importance of the public having sufficient emergency supplies. ✓ Consider the public health implications of pathogens and infectious diseases due to contaminated potable water following the event.
Damage to co-ordination facilities	
<ul style="list-style-type: none"> ● Emergency service and co-ordination facilities (e.g. fire stations, ECCs) may be damaged by the earthquake and/or tsunami and will require structural assessment where damaged before re-opening for response. ● Damaged buildings may preclude access to response equipment and assets. 	<ul style="list-style-type: none"> ✓ Prioritise critical response facilities for building inspections immediately following the event. ✓ Decide and communicate alternate coordination facilities and/or locations between responding agencies. ✓ Communicate to responding agencies the requirement to remove assets (where possible) and staff that reside in tsunami evacuation zones to higher ground/inland where possible following a Long or Strong earthquake, and for staff to wait to receive the 'all clear' from CDEM before re-entering tsunami evacuation zones.

Considerations	Recommendations
Damage to health facilities.	
<ul style="list-style-type: none"> ● Health facilities may be damaged by the earthquake and/or tsunami and will require structural assessment where damaged before re-opening for patient care. ● Damage to health facilities and health infrastructure may negatively impact health outcomes for those who are affected. 	<ul style="list-style-type: none"> ✓ Prioritise critical health facilities for building inspections immediately following the event. ✓ Where applicable, identify, plan and communicate 'field hospital' locations to staff and responding agencies. ✓ Where health facilities are located inside tsunami evacuation zones, communicate the need to evacuate to higher ground/inland following a long or strong earthquake, and for staff to wait to receive the 'all clear' before re-entering tsunami evacuation zones.
Damage to transport infrastructure, roading, ports and airports etc.	
<ul style="list-style-type: none"> ● Disaster waste - a large amount of debris, both man-made (i.e. building facades) and natural (silt/sediment from debris flows), will be generated impacting the ability of responders to reach communities, coordination centres and move efficiently around the region. ● Disruption to transport routes may inhibit the ease with which external assistance can arrive in severely affected Groups. ● Disruption to transport routes will impact the DHB supply chain of medical supplies, currently delivered on a 'just in time' basis. This will quickly (in some cases within 72 hours) result in shortages of medical supplies (medications and consumables), linen and bedding (including surgical and sanitation supplies), and food. ● Disrupted supply chains will also affect the movement of household goods, fuel, groceries etc., affecting the ability of people to meet their basic needs. ● Disrupted supply chains will affect local, regional and national economies. ● Coastal roads and rail in low-lying areas are vulnerable to lengthy closures if co-seismic subsidence occurs. ● Damage to transport infrastructure will isolate communities in some Groups creating 'islands', forcing resources to be delivered via sea or air assets. This will continue until regions are reconnected through the repair of roading assets. 	<ul style="list-style-type: none"> ✓ Identify priority transport routes for repair/debris clearance within the region. ✓ Consider how damage to transport links and nodes could affect the ability to deliver rapid disaster relief. ✓ Plan for a disrupted supply chain including for medical supplies, fuel, household goods and groceries. ✓ Identify communities likely to be isolated by the event and build resilience within them as part of readiness. ✓ Ensure volunteer staff are familiar with the location of EOC facilities within the CDEM Group, and those closest to their home in case they are isolated during the event from their 'usual' EOC/ECC. ✓ Document private (i.e. farm) airstrips in the region which could be used in response (talk to local pilots to map). ✓ If subsidence is likely to occur in the region, response planning should consider risks to land-transport connectivity due to coastal flooding in low-lying areas.

2.5.3 Planning considerations and recommendations: natural environment

Considerations	Recommendations
Secondary and ongoing hazards	
<ul style="list-style-type: none"> ● Due to landslides, lateral spreading and liquefaction, there will be significant mobility restrictions on ground-based reconnaissance. This will place further pressure on aerial reconnaissance assets. ● Following the initial earthquake and tsunami (Refer Volume I), there will be an ongoing hazard to emergency services from aftershocks and associated tsunami and secondary hazards such as landsliding. Health and safety aspects of operating within hazard zones will need to be considered as part of response. ● There will be increased risk of other hazard events due to the impacts from the earthquake and/or tsunami e.g. increased risk of flooding because of landslide dams ● Ongoing secondary hazards, like aftershocks, are likely to adversely affect the mental health of people who experience them. 	<ul style="list-style-type: none"> ✓ Create aerial reconnaissance plans based on pre-determined information priorities. ✓ Develop capability for the management of national and regionally coordinated aerial reconnaissance within Group (e.g. an air asset management plan/ air ops coordinator to coordinate with air traffic control tower). ✓ Consider the H&S risks of response staff working in hazard zones (Appendix A) ✓ Consider secondary and ongoing hazards which will slow/impede/complicate the response. ✓ Support mental health messaging as part of readiness, response and recovery.
Disaster debris and waste	
<ul style="list-style-type: none"> ● Spillage of hazardous materials may contaminate potable water sources or pose a health and safety risk through exposure (e.g. asbestos). ● Poorly managed disaster debris during early response phases can extend and complicate recovery. ● There may be damage to land and soil from debris and contaminated waste. 	<ul style="list-style-type: none"> ✓ Ensure Group disaster waste management arrangements are in place and incorporated in regional response planning as part of readiness (Using the New Zealand Disaster Waste Management Planning Tool' (2018)). ✓ As part of response planning, consideration needs to be given to the following in the context of collection, transport, stockpiling and disposal of waste: <ul style="list-style-type: none"> ✓ The respiratory effects of dried silt resulting from liquefaction ✓ The ability of tsunami to widely spread contaminants ✓ Damp living conditions due to liquefaction and tsunami inundation ✓ Sheltering in place in damp conditions could lead to worsening health outcomes ✓ Damaged buildings linked to fatalities ✓ These buildings will require special treatment for the Coronial process ✓ Buildings containing hazardous materials such as chemicals or asbestos ✓ Disposal of material and H&S of emergency services entering buildings where this has been disturbed. ✓ Consider the public health implications of hazardous waste disposal, chemical spills and radioactive substances which make constitute disaster debris and waste.

Considerations	Recommendations
Damage to waterways and marine environments	
<ul style="list-style-type: none"> ● Damage to hazardous material holding facilities (e.g. fuel tanks) may result in the release of contaminants into waterways, air and land. This could pose an additional threat to life and property. ● Loss of ecosystems. 	<ul style="list-style-type: none"> ✓ Consider how regionally stored contaminants could pose a threat to life safety if released into the environment. ✓ Determine how the environmental response will be prioritised across the response phases.

2.5.4
Planning considerations and recommendations:
economic environment

Considerations	Recommendations	
Damage to cultivation land		
<ul style="list-style-type: none"> ● The impacts of a tsunami on cultivation would be widespread and lasting. Infrastructure to support agriculture, viticulture and arable farming would be severely impacted. ● Soil quality likely to be contaminated in worst affected regions. ● Employment related to this sector would be severely impacted. 	<ul style="list-style-type: none"> ✓ Promote business continuity planning within agricultural sector. ✓ Investigate likely impacted areas and estimated loss to the regional economy. ✓ Expect and plan for high requirement for financial assistance from employers and employees affected by the event. ✓ Investigate how industry capability and capacity can be utilised to support the response (e.g. tourism operators, primary industries). ✓ Consider welfare support to foreign nationals (e.g. seasonal workers) and coordination of repatriation of foreign nationals. ✓ As part of readiness, encourage businesses (and homeowners) to carry sufficient building and contents insurance. 	
Damage to Central Business Districts (CBDs)		
<ul style="list-style-type: none"> ● CBD's in most parts of the east coast are susceptible to tsunami. The damage caused to retail and light commercial outlets would likely be extensive, resulting in loss of income and employment for large numbers of the population. 		

Considerations	Recommendations
<p>Disruption to business operations</p> <ul style="list-style-type: none"> • Small and large businesses will be impacted by the event. This may affect their ability to continue to employ people and generate income in the short, medium and long term depending on how much they have been impacted. A lack of employees in severely affected Groups may also impact the ability of businesses to continue to operate. 	<ul style="list-style-type: none"> ✓ Promote business continuity planning within agricultural sector. ✓ Investigate likely impacted areas and estimated loss to the regional economy. ✓ Expect and plan for high requirement for financial assistance from employers and employees affected by the event.
<p>Tourism</p> <ul style="list-style-type: none"> • Tourism would be impacted in affected areas, especially in Groups who heavily rely on tourism for their economy. Employment and businesses related to this sector would be significantly impacted. 	<ul style="list-style-type: none"> ✓ Investigate how industry capability and capacity can be utilised to support the response (e.g. tourism operators, primary industries). ✓ Consider welfare support to foreign nationals (e.g. seasonal workers) and coordination of repatriation of foreign nationals. ✓ As part of readiness, encourage businesses (and homeowners) to carry sufficient building and contents insurance.
<p>Individual livelihoods</p>	
<ul style="list-style-type: none"> • With many businesses disrupted/no longer able to operate as a result of the impacts of the event, individual livelihoods may be compromised causing and enhancing pre-existing vulnerabilities within affected populations. 	<ul style="list-style-type: none"> ✓ Ensure businesses are engaged early on when planning for economic recovery. ✓ Plan for increased demand on financial assistance services in impacted areas.
<p>Loss of regional connections for distribution</p>	
<ul style="list-style-type: none"> • Loss of key ports, airports and transport 'hubs' will affect the efficiency of the supply chain, in some regions will initially stop the delivery of goods and services. 	<ul style="list-style-type: none"> ✓ Plan for a disrupted supply chain and identify alternative transport options/paths for goods and services to be delivered into the CDEM Group.

2.5.5 Further considerations

The following section expands on the information contained in Section 2.5 where further information is required.

2.5.6 Rapid disaster relief

Rapid disaster relief is the immediate provision of medical care, water, food, shelter and sanitation to ease the suffering of those affected by a disaster (HBCDEM, 2019).

Due to the number of resources required to meet the basic needs of those affected, the ability of the unofficial and official response to deliver rapid disaster relief in severely affected CDEM Groups will be quickly overwhelmed, creating a gap which will need to be filled through domestic and/or international assistance.

Due to the scale and magnitude of impacts anticipated in a large Hikurangi event, the provision of quick, 'no regrets' rapid disaster relief to impacted areas will be a priority. The scale of the disaster will require needs to be assessed rapidly, with limited information and an incomplete understanding of impacts (HBCDEM, 2019).

Following a large Hikurangi event, it is likely there will be isolated populations as a result of evacuation following the long or strong earthquake, and the presence of physical obstacles isolating some communities, e.g. due to landslides. The logistics of providing rapid disaster relief will need to be considered within this context.

Key areas identified in this toolbox where rapid relief will be required include:

- Provision of emergency shelter and household goods e.g. clothing, hygiene products etc.
- Provision of food and water to meet the basic and immediate needs of those who are displaced and in need.
- Provision of medical assistance and supplies for the injured and those in need.

Activities to reduce the rapid disaster relief 'gap' are listed in the table on the following page and expanded upon in Section 2.8.3 'Develop the Plan'. It is recommended that CDEM Groups refer to the Sphere guidelines for minimum standards regarding the provision of WASH (Water, Sanitation and Hygiene), nutrition and shelter.



Image: John Cowpland

Activities to reduce the rapid disaster relief 'gap'
 (Activities best completed during readiness are shaded grey)

<p>WASH (Water, Sanitation and Hygiene)</p>	<ul style="list-style-type: none"> • Use domestic rainwater tanks. • Use stocks from water bottling plants. • Redistribute resources from areas with surplus to those with deficit, e.g. redistribute potable water with water tankers. <p style="background-color: #cccccc;">• Investigate use of surface water sites, aquifers, local dams, springs and reservoirs as alternate water supplies</p> <ul style="list-style-type: none"> • Where possible treat non-potable water to drinking water standards • Use small-scale desalination plants where it will take a long time to restore potable water. • Encourage residents to bury their own waste on site / contain for collection and disposal. • Procure/install long drops, composting toilets, chemical toilets and portaloos. • Through PIM, manage expectations and empower communities to help themselves and support health messaging (e.g. sanitation) from the Ministry of Health.
<p>Nutrition</p>	<ul style="list-style-type: none"> • Consider establishing community emergency hubs to provide food supply until the official response can get to affected people. • Use locally grown and processed food e.g. farms / lifestyle blocks, factories, orchards etc. • Encourage residents to ration their food if it is likely their community will not be re-supplied quickly.
<p>Shelter</p>	<ul style="list-style-type: none"> • Conduct early reconnaissance of emergency shelter options to minimise the impact of a lack of shelter and reduce time taken to house the displaced, e.g. billeted accommodation, open spaces etc. • Encourage billeting of displaced persons people in the local community • As part of Public Information Management (PIM), communicate the demand on emergency shelter to manage community expectations during the response. <p style="background-color: #cccccc;">• Scope alternative emergency shelter options within the Group. Note: WREMO has recently undertaken a project investigating emergency shelter options for the Wellington Region.</p>

2.5.7 Needs assessment and registration

Following a large Hikurangi event, impact and needs assessments will be community outcome driven and based on population exposure. As part of needs assessment, human, response, political and economic needs will be considered.

Requirements for rapid disaster relief will be assessed based on an estimated impact or population scale needs assessment in the first instance, rather than waiting for individual needs to be assessed.

It is unlikely that needs assessment and registration as currently defined will be able to take place during the initial response, as it will take some time to set up Civil Defence Centres (where applicable), send out mobile teams or be able to use online or telephone services used to carry out the registration process.

2.5.8 Cordon management

A large Hikurangi event will create a hazardous response environment, therefore there will be a need to establish cordons to control movement in and out of hazardous areas.

Cordons will need to be established in:

- Areas which have experienced significant damage requiring USAR or that pose an ongoing threat to life safety, and,
- Areas exposed to an ongoing secondary hazard risk, e.g.:
 - Susceptible to continued tsunami inundation (tsunami evacuation zones may be used as a guide for cordon dimensions in some circumstances).
 - Susceptible to other natural hazards, e.g. landslides, rock fall.

The number of cordons required following a large Hikurangi event may displace significant amounts of people and security resourcing of these cordons may also require innovative solutions due to the scale of damage expected and the limits of emergency services resources.

Cordon security may therefore need to be prioritised amongst cordons in each region, according to those which will have the greatest effect preserving life.

The social and economic impacts of establishing cordons will need to be carefully considered as part of cordon planning and implementation.

2.5.9 Tsunami hazard cordons

It is anticipated that tsunami will occur and represent a threat for over 24 hours following the mainshock. Due to the unpredictable nature of tsunami, cordons will need to be established in tsunami inundation areas (where applicable following risk assessment) to control the movement of people through these hazardous areas.

In addition, the ongoing threat of tsunami may delay the rescue of trapped or injured people. This will place a significant amount of stress on those involved, including responding agencies and affected families, and will require effective communication with those affected and significant security resourcing of these cordons to prevent further loss of life from unofficial rescue/retrieval operations.

2.5.10 Further PIM considerations (PIM)

Where Groups are without power and telecommunications, alternative ways of communicating with the public will need to be developed, e.g. noticeboards, regular community meetings, radio broadcast.

The scale of a large Hikurangi event also has the implication that complex messages will need to be communicated to the public and officials. Some of these messages can be anticipated and prepared as part of readiness. These messages relate to the following complex issues:

- Domestic and/or international assistance will be prioritised meaning that some communities may receive assistance ahead of others.
- Some communities may be isolated for a prolonged period.
- The ongoing risk of tsunami may mean that USAR and emergency services will not be able to immediately enter tsunami evacuation zones to rescue or search for missing people.
- Lifelines will take a significant amount of time to be repaired meaning some communities will be without essential services and need to use alternatives for a significant amount of time, e.g. portaloos.

Where specific messaging relating to the event or messages not included in the consistent messaging guide need to be developed, all CDEM Group PIM functions should communicate, collaborate and consistently use new shared messaging to avoid conflicting or confusing messaging between regions.

Applicable chapters of the Consistent Messaging Guide for a large Hikurangi event include:

- Evacuation, sheltering-in-place and post-disaster safety (including emergency sanitation)
- Earthquakes
- Tsunami

2.6 Engaging with iwi/Māori

As Treaty partners to the Crown and members of the wider community, it is essential that whānau, hapū and iwi are involved in the response and recovery to a large Hikurangi event.

This toolbox has explored consequences across the social, built, natural and economic environments, but further analysis and engagement is required with iwi to ensure integration of iwi / Māori perspectives and tikanga before, during and after a large Hikurangi event.

Hikurangi Response Planning stakeholders therefore recommend comprehensive engagement and integrative response planning with iwi, Taiwhenua and marae as part of the national and regional response planning process, to strengthen relationships and the response to a large Hikurangi event. Integration of lessons learnt from tangata whenua and CDEM partnerships during the 2020 COVID-19 event is also essential as part of regional and national response planning to further improve future responses to future emergencies and disasters in New Zealand.

2.7 Response phase concept

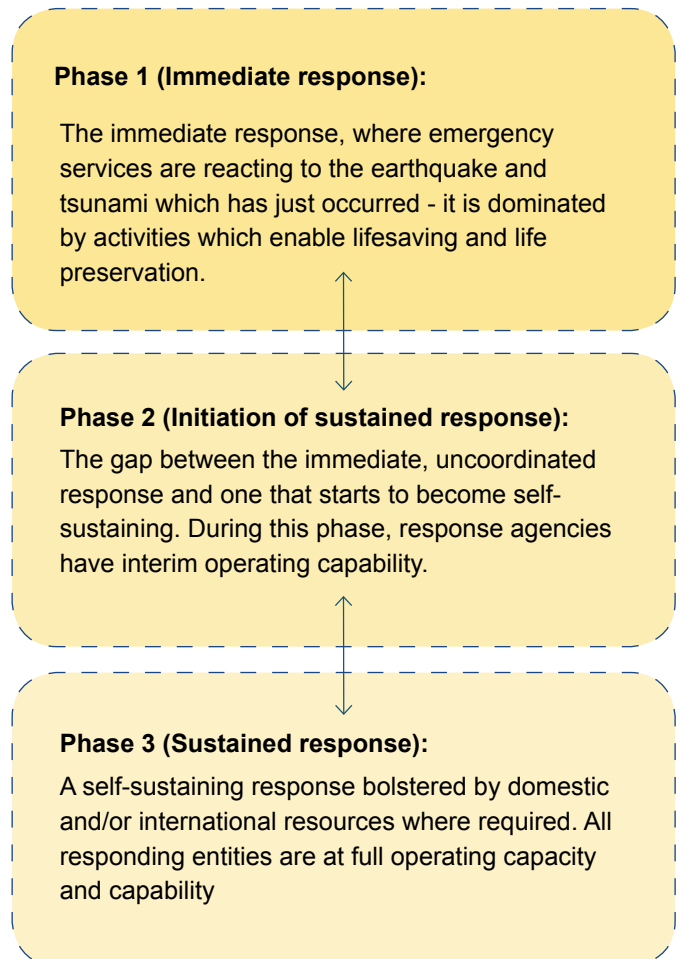
Due to unpredictable nature and number of unknowns following a large Hikurangi event, a response phase concept has been developed to help CDEM Groups track the progression of the response in their region. The concept is based on qualitative response activities and does not include timeframes or deadlines because of the range and variability of consequences from a catastrophic disaster. It is recommended that activities listed within the phase concept below are transformed into SMART objectives during response, when the operating environment is known and realistic timeframes for achieving objectives can be determined.

Each response phase is comprised of response activities and a 'phase transition' which marks the movement from one response phase to the next. Response activities are

divided between workstreams and phases adapted from the Wellington Earthquake National Initial Response Plan (WENIRP). Not all activities need to be satisfied to move to the next response phase. As Groups progress through each phase, it is expected Groups will increasingly take recovery into consideration as part of the response.

The response phase concept recognises that it is likely each CDEM Group will progress through their response at different paces, dependent on the impact of the event and the capacity and capability of the Groups. This may lead to a requirement for a coordinated shift of response resources and capabilities between CDEM Groups during the response. Additionally, subsequent events such as aftershocks may mean some or all workstreams need to shift back and restart at Phase 1 or 2.

Three phases are used for the Hikurangi Response Planning toolbox:



Planning tools for the transition to recovery and recovery are not included in the Hikurangi Response Planning Toolbox. However readers are directed to the National CDEM Plan (2015), the CDEM Act (2002), relevant DGLs and technical standards issued under the CDEM Act 2002, and CDEM Group plans for recovery guidance.

Response activities

Phase 1: Immediate Response	Phase 2: Initiation of Sustained Response	Phase 3: Sustained Response
Coordination, Command, Control and Communications		
<ul style="list-style-type: none"> ✓ Activation of ECCs (not fully staffed). ✓ Initial comms with responding agencies, EOCs and the NCMC –partial coordination of the response by CDEM. ✓ Declaration of a state of local emergency (if appropriate). 	<ul style="list-style-type: none"> ✓ The action planning process is underway. ✓ Liaison officers are in ECCs – there is full coordination of the response by CDEM. ✓ Available resources are being assigned to appropriate Requests for Assistance. ✓ ECCs begin to link with tangata whenua response networks (both organised and spontaneous). 	<ul style="list-style-type: none"> ✓ Full and sustainable staffing of ECCs is achieved. ✓ Key decisions are supported by strong situational awareness. ✓ ECCs are linked to tangata whenua response networks (both organised and spontaneous). ✓ Action plans are being executed under established operational cycles.
Phase Transition		
Initial comms established with agencies and the CDEM planning process has been initiated.	First action plan developed and communicated to agencies.	Planning for the transition to recovery has begun.
Reconnaissance and Information		
<ul style="list-style-type: none"> ✓ Situational awareness is comprised of initial information from responding agencies and the public (via social media). ✓ Community-level situational awareness is developing but has gaps. ✓ Agencies are undertaking own reconnaissance (e.g. lifelines). 	<ul style="list-style-type: none"> ✓ Initial intelligence is being shared to support the development of shared situational awareness. ✓ Pre-arranged reconnaissance plans are being executed. ✓ Initial reconnaissance taskings are being provided to agencies with some coordination. 	<ul style="list-style-type: none"> ✓ Intelligence cycle is supporting decision making, ✓ EOCs, ECCs, responding agencies and the NCMC have a common operating picture. ✓ Command, control and communications components are fully enabled by reconnaissance and information component.
Phase Transition		
Analysis of information has begun to inform action planning	Intelligence cycle is in place	Intelligence functions are focused on supporting the transition to recovery.

Phase 4: Transition to recovery

Phase 1: Immediate Response	Phase 2: Initiation of Sustained Response	Phase 3: Sustained Response
Rapid relief and welfare services delivery		
<ul style="list-style-type: none"> ✓ The community-led response is mobilising to meet basic needs with the resources immediately available to them. ✓ Community-level awareness of the need for rapid disaster relief and wider support is developing. ✓ Any rapid disaster relief in this phase is provided to communities on an ad hoc or based on pre-agreed priorities/requirements. 	<ul style="list-style-type: none"> ✓ The community-led response is supported by the coordinated supply and delivery of rapid disaster relief. ✓ Iwi/Taiwhenua and Hauora Providers activate their local and regional response to the crisis Immediate (lifesaving needs) are being met, but basic needs are not yet fully met. ✓ Welfare services delivery is based on population-based needs assessments. 	<ul style="list-style-type: none"> ✓ Basic needs are being met ✓ Welfare services delivery is based on individual needs assessments. ✓ Iwi/Taiwhenua and Hauora Providers continue to respond to the event locally and regionally (TPK involved, even if in reduced capacity). ✓ Welfare services are being re-prioritised in some areas and may be shifting to other regions.
Phase Transition		
The ECC can coordinate the supply delivery of rapid disaster relief to meet the immediate needs of affected populations.	A basic supply chain has been developed which meets the immediate and basic needs of communities. Support and services are coming in from other regions.	Communities can meet their own basic needs through a re-established supply chain. Welfare support and services shift to a long-term recovery focus.
Operations Response (Health, USAR etc.)		
<ul style="list-style-type: none"> ✓ Responding agencies are working to their own initial response plans in order to save lives and property. ✓ Centralised coordination across agencies is not yet in place. 	<ul style="list-style-type: none"> ✓ Responding agencies are focused on lifesaving activities and meeting the immediate (lifesaving) and basic needs of communities (e.g. providing health services, safety, security etc.). ✓ Responding agencies are being supported by ECCs to meet the immediate (lifesaving) and basic needs of communities. 	<ul style="list-style-type: none"> ✓ Responding agencies can meet their pre-event service levels for responding to 111 calls (i.e. back to 'normal'). ✓ ECCs have the capacity to respond to (appropriate) requests for assistance and are therefore able to support responding agency operations.
Phase Transition		
ECCs can respond to priority Requests for Assistance from responding agencies but may not have access to enabling resources.	ECCs have the capacity to support responding agencies to meet more than the communities immediate and basic needs. Responding agencies can action most requests for assistance.	Responding agencies no longer need CDEM coordination or support to operate and no longer request assistance.

Phase 4: Transition to recovery

Phase 1: Immediate Response	Phase 2: Initiation of Sustained Response	Phase 3: Sustained Response
Procurement of resources and services		
<ul style="list-style-type: none"> ✓ Additional resources are not yet available to support the response. ✓ The community-led response and responding agencies are working with the limited resources immediately available to them. ✓ External resources based on pre-agreed priorities, arrangements and requirements begin to arrive in Group. 	<ul style="list-style-type: none"> ✓ External resources based on response-specific resource requests are deploying to support the response. ✓ Operations functions are undertaking proactive resource gap-analysis and prioritising resource requirements. 	<ul style="list-style-type: none"> ✓ Gap analysis has been undertaken and ongoing resource needs are (generally) understood and communicated to appropriate coordination centres where required. ✓ Some resources and services may be reprioritised between regions or areas once outcomes are achieved.
Phase Transition		
Initial, response-specific resource requirements can be determined and requests for assistance (RFA) can be made to appropriate coordination centres.	ECCs understand current, and have an initial understanding of potential future resource requirements. ECC's are coordinating the delivery of resources and services in support of prioritised requirements.	ECCs have an initial understanding of the resources required for the transition to recovery and recovery. Controller(s) are directing the reprioritisation of resources and services into initial recovery planning and actions.
Emergency supply chain and people movements		
<ul style="list-style-type: none"> ✓ Limited ad hoc responsive resource movements within and between regions possible through 'open' logistics links and nodes. ✓ Some CDEM Groups may only have regional supply chains available. ✓ Ad hoc intra-regional people/critical patient movements are prioritised. 	<ul style="list-style-type: none"> ✓ Limited coordinated movements within and between regions possible through 'open' logistics links and nodes (Note, some logistics links and nodes not available in Phase 1 may now be available for use in this phase). ✓ Coordinated people/patient movements within and between regions begins. 	<ul style="list-style-type: none"> ✓ Response staff are actively coordinating elements of the supply chain (e.g. prioritisation, and or providing assets to fill gaps). ✓ A coordinated supply chain has been established which reaches all communities (including those isolated by the event).
Phase Transition		
Reconnaissance on damage to critical logistics links and nodes has begun. Ad-hoc repairs or debris clearance is being conducted to enable basic access to key areas.	Work to restore, or work around damaged/use alternative logistics links and nodes has begun.	Response intervention in the supply chain is no longer required. The supply chain can meet community, responding agency, emergency service and business needs without CDEM managed or coordinated logistics.

Phase 4: Transition to recovery

Phase 1: Immediate Response	Phase 2: Initiation of Sustained Response	Phase 3: Sustained Response
Lifelines utilities restoration		
<ul style="list-style-type: none"> ✓ Lifeline utilities gain an initial appreciation of the event and where possible provide information to ECCs to enhance overall situational awareness regarding event impacts. ✓ Where possible, alternatives are implemented to maintain the supply of essential services to affected communities and/or priority areas. 	<ul style="list-style-type: none"> ✓ Lifeline utilities are supported to repair and restore their assets, networks and services or identify alternatives to enable the provision of services to affected areas. 	<ul style="list-style-type: none"> ✓ Depending on the damage sustained lifeline utilities have long-term plans in place to maintain alternatives and/or restore essential services to affected communities.
Phase Transition		
Lifeline utilities companies gain situational awareness about the impacts of the event on their assets.	Temporary solutions are in place to provide service to prioritised locations. Prioritised repair of lifeline utility assets to enable the response has begun.	Long term plans have been developed to maintain temporary repairs/alternatives and/or provide long term solutions to affected communities.
Public Information Management		
<ul style="list-style-type: none"> ✓ Communities are reliant within themselves, and on each other for information and situational awareness. ✓ CDEM communication is limited and life-safety focused. 	<ul style="list-style-type: none"> ✓ ECCs can warn and inform communities with information about the situation. ✓ ECCs can provide increasingly proactive, rather than reactive, comms. 	<ul style="list-style-type: none"> ✓ PIM functions are meeting community's critical information requirements. ✓ PIM focus is largely transitional from providing life-safety and response information to long term recovery information.
Phase Transition		
PIM functions have activated, and limited coordinated messaging is being provided to impacted communities.	PIM plans are developed and communicated – lead and support agencies have a shared mental model and can communicate response priorities and information about the situation to the media and communities.	PIM requirements and resourcing are incorporated into recovery planning.

Phase 4: Transition to recovery

Phase 1: Immediate Response	Phase 2: Initiation of Sustained Response	Phase 3: Sustained Response
Environment		
<ul style="list-style-type: none"> ✓ Environmental threats to life safety and preservation, e.g. chemical spills, are dealt with by emergency services ad hoc. on a case-by-case basis. ✓ Some response activities may exacerbate or cause environmental hazards e.g. disturbance of asbestos from USAR activities. 	<ul style="list-style-type: none"> ✓ Environmental threats to life safety and preservation caused by the initial event are proactively identified and communicated to responding agencies. ✓ Coordinated removal of debris occurs to enhance the mobility of responding agencies in the region. 	<ul style="list-style-type: none"> ✓ Environmental threats are identified and addressed with mitigation strategies to reduce risk and achieve positive environmental and community outcomes.
Phase Transition		
Environmental threats to life safety are identified.	Environmental threats to life safety are identified and mitigation strategies are developed.	Environmental threats to life safety have been mitigated and remedial work starts to begin to address the threat to people and the environment.

Phase 4: Transition to recovery

2.8 Application of the CIMS Planning P in Hikurangi Response Planning

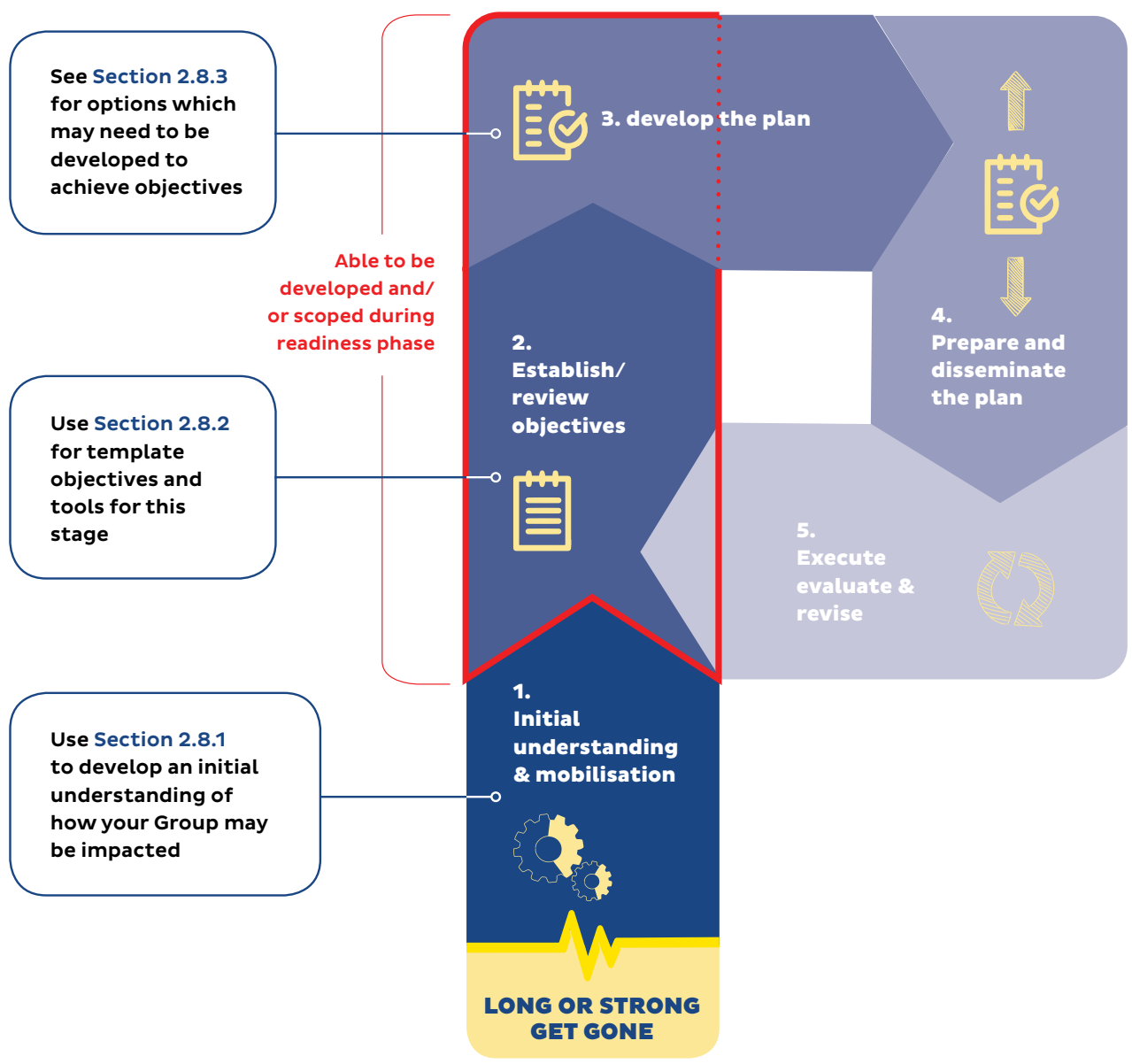
The Planning P below (adapted from CIMS 3rd Edition) represents the underlying process for planning. In addition, the CDEM sector is provided with detailed guidance and advice on how response planning should be performed in DGL 19/15 Response Planning in CDEM. CIMS 3rd edition recognizes that more detailed planning processes are used by agencies. CDEM Groups should refer both CIMS 3rd edition and DGL 19/15 Response Planning in CDEM to support ongoing response planning efforts.

While most of the 'Planning P' process will be dependent and based on the realised impacts. of a large Hikurangi event, scoping and the development of the likely impacts,

response objectives and response options for a large Hikurangi event can be completed during readiness to benefit the initial response.

This section aims to provide CDEM Groups with information relevant to a large Hikurangi event for the first three stages of the 'Planning P', up to and including options development (Stage 3). Options analysis, plan preparation and dissemination (Stage 4), and plan execution and evaluation (Stage 5) are dependent on realised impacts, and therefore are unable to be included in this toolbox.

Bespoke Customised impact analysis, response objectives and priorities and options have been developed as part of the project for the five participating CDEM Groups which are found in the Regional Response Concept Papers (Annex A).



2.8.1

Stage 1: Initial understanding and mobilisation

Holistic consequence analysis (CIMS 3rd Edition) can be used to determine the potential impacts of an event in across the four environments: Built, Social, Natural and Economic.

Generic impacts, organised by these four environments, are provided in Section 2.5 to support impact analysis. These can be used as a starting point for Groups to assess the possible impact of a large Hikurangi event on their region as part of readiness.

2.8.2

Stage 2: Establish/review objectives

As part of Hikurangi Response Planning, a proposed Group Controller's Intent, response objectives and response priorities were developed. These represent a starting point, which can be adapted by all CDEM Groups to suit their requirements. All response objectives and priorities listed below should be tested to ensure their validity in the context of the credible scenario.

Please note that only Phase 1 objectives are included as subsequent priorities will be dependent on how the response progresses in each CDEM Group.

PHASE 1
Group Controller's Intent
<p>To provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles. This will be achieved by ensuring:</p> <ul style="list-style-type: none"> • The safety and wellbeing of people is kept at the centre of all response decisions. • The public are protected from entering dangerous areas. • People's basic and immediate needs are met as quickly as possible. • People can access adequate medical assistance. • A CIMS coordinating structure is established with a clear reporting lines between the CDEM Group and supporting organisations. • Information is readily shared between response organisations to improve situational awareness and decision making.

Response objectives

The following represent response objectives for Response Phases 1 following a large Hikurangi event:

- To undertake lifesaving activities and support self-evacuation, within acceptable risk levels, through the provision of clear information and direction.
- To activate appropriate response facilities to enable coordination of the response at all levels.
- To establish appropriate communication to enable coordination of the response and information sharing between key agencies.
- To coordinate the provision of rapid disaster relief to affected communities to meet immediate and basic needs.
- To ensure that responding agencies within the region are alerted to issues relating to the event.
- To ensure the timely provision of key emergency information to people impacted by the event.

Please note - to make these objectives 'SMART', CDEM Groups should apply realistic and achievable timeframes to these objectives following a large Hikurangi event based on the realised impacts.

Response priorities

The priority for all responding personnel is to ensure the safety and wellbeing of themselves and their families.

Initial Group Controller Priorities:

- Conduct life safety activities
- Identify and source key resources needed for response
- Establish response coordination arrangements
- Ensure immediate needs of the population are met
- Provide the public with appropriate response information
- Gain situational awareness
- Prioritise and manage resources.

All priorities described above are underpinned and linked to response objectives in the National CDEM Plan and Guide (2015).

2.8.3

Stage 3: Develop the plan

As part of the Hikurangi Response Planning project, several key options for activities led by CDEM Groups during Phase 1 have been developed as a starter-for-ten, to help Groups begin to 'develop the plan'.

The feasibility of the following options has been estimated for the worst affected CDEM Groups following the credible planning scenario. Following a large Hikurangi event, it will be important to expand on and reassess the options listed below as several options may need to be combined or altered to achieve a response objective.

Facilitating communications

Between CDEM Groups and responding agencies

Response Option	Use satellite communications (BGAN, Iridium Go etc.) to communicate between agencies.	
Feasibility	HIGH	Possible, if resources available and accessible following event.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Not all agencies have satellite communications equipment. • Some agencies satellite comms. are in areas that will be impacted by the tsunami. • Staff lack training or knowledge of how to use equipment. • Lack of protocol could overload lines/inhibit communication between CDEM Groups and NCMC. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM Staff access satellite phone and contact all other agencies with satellite phone capability to establish comms network. • All agencies ensure satellite comms equipment available and monitored to enable comms with GECC. 	
Advantages	<ul style="list-style-type: none"> • Satellite communications at a CDEM Group level is very likely to still be operational following the earthquake. Can operate on battery power. 	
Disadvantages	<ul style="list-style-type: none"> • Not everyone has satellite communications capability, so limited network. • Satellite communications needs to be accessible to the receiving agency. • May take too long to contact each agency individually. • Satellite phones might not be switched on/have expired SIMS/low battery. 	

Between CDEM Groups and responding agencies

Response Option	Use VHF or DMR system to broadcast alerts and notifications	
Feasibility	HIGH	Possible, if resources still active and switched on to enable messages to be broadcast and received.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Not all agencies use VHF or DMR. Some agencies VHF units are located in areas that will be impacted by the tsunami. • Lack of protocol in some cases could overload channels between CDEM Groups and agencies. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM Staff access VHF or DMR unit and broadcast alert / warning on CDEM channels. • All agencies to monitor VHF or DMR for alerts / warnings. • All agencies ensure onward delivery of alerts and warnings internally. 	
Advantages	<ul style="list-style-type: none"> • VHF and DMR still likely to be operational following the earthquake. Can operate on battery power. (average battery life of a VHF radio typically longer than average cell phone battery). • VHF radios have better coverage and fewer shadow areas than cell phones. • VHF radios enable collective safety with other stations listening. 	
Disadvantages	<ul style="list-style-type: none"> • Not everyone has VHF, so limited network. VHF at receiving end needs to be switched on and on the right channel. • Generator / back-up power needs to be maintained for some repeater sites (mostly urban-based repeaters). 	

Response Option	Use runners to communicate with other agencies	
Feasibility	HIGH	Possible, but will depend on accessibility and geographic distance between coordination centres.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Communications can't get through due to limited accessibility of areas from the earthquake. • H&S risks for the runner. • Using runners may result in time-lagged communications. 	
Key Tasks	<ul style="list-style-type: none"> • Each agency establishes personnel and equipment to act as runners between agencies. 	
Advantages	<ul style="list-style-type: none"> • Personnel are likely to be available to conduct the role. • Requires limited resources. 	
Disadvantages	<ul style="list-style-type: none"> • Communicating between agencies will take much longer. • Routes between agencies need to be accessible. 	

Between CDEM Groups and responding agencies

Response Option	Use existing regional warning mechanisms to alert response personnel and agencies (e.g. Whispir, subscription text alert schemes)	
Feasibility	MED	Possible if resources to disseminate and receive message still active to enable messages to be broadcast and received
Risks and vulnerabilities	<ul style="list-style-type: none"> Resources to enable message to be broadcast are not available. Message is not received by response agencies. 	
Key Tasks	<ul style="list-style-type: none"> CDEM Duty Officer disseminates alerts and warnings on all available medium from a safe location All agencies ensure onward delivery of alerts and warnings internally. 	
Advantages	If systems are still operational message will be received by a large number of responders.	
Disadvantages	<ul style="list-style-type: none"> Heavily reliant upon telecommunications technology and infrastructure that may have been damaged by the earthquake and tsunami. In worst affected Groups, reliant on battery life of damaged cell phone towers. Not every Group has this option. 	

Between CDEM Groups and the public

Response Option	Use existing forms of communication (Radio broadcast, social media, print media)	
Feasibility	MED	Many methods are unlikely to be available due to the likely damage to communications infrastructure and the loss of power. However, where the infrastructure is still operational it may still be possible to send out communications.
Risks and vulnerabilities	<ul style="list-style-type: none"> Warnings and information are unable to be uploaded or broadcast. Requires communications and power infrastructure to still be operational. Only some of the population receive the warnings and information. Lack of protocol in some cases could overload channels between CDEM Groups and agencies. 	
Key Tasks	<ul style="list-style-type: none"> CDEM PIM to issue messages via social media or radio and provide messages for broadcast on radio Partner agencies to utilise all available platforms to support the dissemination of warnings and information to the public. 	
Advantages	<ul style="list-style-type: none"> Quick ability to push out information and receive intelligence from the community. Can be done from any location. 	
Disadvantages	<ul style="list-style-type: none"> Unlikely to be possible if the supporting infrastructure is unavailable. 	

Between CDEM Groups and the public

Response Option	Leaflet drops	
Feasibility	MED	Possible using vehicles and other means (e.g. dropped into areas by aircraft or drone).
Risks and vulnerabilities	<ul style="list-style-type: none"> Requires personnel to deploy. Resource heavy and these resources may not be available. Requires facilities to print leaflets. 	
Key Tasks	<ul style="list-style-type: none"> CDEM to acquire required resources to enable leaflet drops. Staff or volunteers identified and briefed to conduct drops. 	
Advantages	<ul style="list-style-type: none"> Information will be received by anyone who collects the leaflet, including hearing impaired. Can provide detailed information to people. 	
Disadvantages	<ul style="list-style-type: none"> Takes time to deploy, so only good to provide information later in the response where no other means is possible. Requires roading to still be useable for drops by vehicle. Requires significant resources to conduct. Information may not reach people with low literacy unless symbols and diagrams are used. 	

Response Option	Broadcast information from mobile speaker units on vehicles	
Feasibility	LOW	Possible in areas where the equipment exists or can be easily acquired.
Risks and vulnerabilities	<ul style="list-style-type: none"> Requires personnel to deploy into potentially hazardous locations, which may not be accessible by vehicle. Not everyone will hear the messaging. Does not reach hearing impaired. 	
Key Tasks	<ul style="list-style-type: none"> CDEM to acquire required resources to enable broadcast from vehicles. Staff or volunteers identified and briefed to conduct messaging. Agencies with vehicle broadcast capability to provide additional support. 	
Advantages	<ul style="list-style-type: none"> Works on the car battery, or an external car battery pack. Will be heard by anyone close to the broadcast. 	
Disadvantages	<ul style="list-style-type: none"> Takes time to deploy. Cannot deploy into areas at risk of tsunami after the earthquake safely. Requires roading to still be useable. Not every CDEM Group has the capability. Difficult to update information, would need to drive same route. Could only hear part of the message or not hear the message. 	

Between CDEM Groups and the public

Response Option	Door to Door	
Feasibility	LOW	Possible using volunteers.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Requires personnel to deploy. • Some areas may not be accessible or too dangerous to deploy staff into. • H&S requirements of deploying volunteers. • Activation of volunteers required with limited comms. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to acquire required resources to enable door to door warning and informing. • Staff or volunteers identified and briefed to conduct door to door activities. 	
Advantages	<ul style="list-style-type: none"> • Information will be received by anyone who can be contacted. • Can provide detailed information to people. 	
Disadvantages	<ul style="list-style-type: none"> • Takes time to deploy so only good to provide information later in the response where no other means is possible. • Cannot deploy into areas at risk of tsunami after the earthquake safely. • Requires roading to still be useable for access to communities. • Requires significant resources to conduct. 	

Response Option	Aircraft with speakers	
Feasibility	V.LOW	Possible in areas where the equipment exists or can be easily acquired.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Requires personnel to deploy and facilities to take off from. • Not everyone will hear the messaging (especially hearing impaired). 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to acquire required resources to enable broadcast from aircraft and provide messaging. 	
Advantages	<ul style="list-style-type: none"> • Can cover large areas quickly. 	
Disadvantages	<ul style="list-style-type: none"> • Takes time to deploy. • Requires aircraft and facilities to support their use. • Not everyone will hear the message or will only hear part of the message. • Equipment not readily available. 	

Providing shelter

Response Option	Use existing buildings (Community Halls, Schools etc)	
Feasibility	HIGH	Possible, given the amount that would likely be available for use.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Buildings are compromised by the earthquake and unusable. • Significant assets (sports halls, large schools) are located in inundation zones and unusable. • Security within facilities. • Risk of disease outbreaks / community illness if poor WASH (Water, Sanitation and Hygiene) facilities in place. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to identify available facilities and establish as emergency shelter. • Welfare Agencies / local authorities to support CDEM with establishing facilities. 	
Advantages	<ul style="list-style-type: none"> • Buildings have large capacity. • Schools and community facilities are more likely to survive due to higher requirements for earthquake strengthening. • Support infrastructure already in place (sanitation etc). • Can operate in all weather conditions. 	
Disadvantages	<ul style="list-style-type: none"> • Not a long-term solution. • Potential for security issues. • Lack of private space for displaced persons. • Difficult to house pets with owners. • May need to reinstate WASH facilities if damaged. 	

Response Option	Shelter in Place	
Feasibility	HIGH	Possible with support to make temporary repairs where needed.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Living conditions may promote community illness. • Lack of sanitation and utilities. • Security of people and their property. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to support acquisition of resources to make minor repairs to households. • Local Authorities to provide rapid assessment of building safety to enable people to remain in place. 	
Advantages	<ul style="list-style-type: none"> • Requires less resources from CDEM to support community. • Keeps people in familiar surroundings. • Provides a longer-term solution. • Pets can be housed with owners. 	
Disadvantages	<ul style="list-style-type: none"> • Not everyone will be able to shelter in place where damage is too severe. • Requires a rapid building inspection process to occur, which will take time. • If building assessment is not possible, some people will be in unsafe conditions. • Could result in community illness if WASH facilities not restored. 	

Providing shelter

Response Option	Use tourist accommodation	
Feasibility	HIGH	Possible if it has not been damaged severely by the earthquake / tsunami.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Possible lack of utilities such as power or water in severely affected regions. • Limited availability of accommodation. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to work with owners to provide emergency accommodation. • CDEM to support acquisition of resources to make minor repairs to accommodation where required. 	
Advantages	<ul style="list-style-type: none"> • Some areas can provide accommodation for large numbers of people. • Provides a longer-term solution. • Requires little resource from CDEM to implement. • Not impacted by weather. • Gives private space to displaced persons. 	
Disadvantages	<ul style="list-style-type: none"> • Buildings need to be assessed before they can be used. • A lot of tourist accommodation is located on the coast. • Cost. • Will require support for WASH facilities if utilities damaged etc. 	

Response Option	Use cruise ships (coordinated by NCMC)	
Feasibility	MED LOW	Possible if cruise ships can be brought in without tourists.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Ability to maintain food supply. • Potential for community illness. • Ongoing risk of tsunami if anchored on east coast. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to acquire resource and establish procedures for embarkation of impacted people. 	
Advantages	<ul style="list-style-type: none"> • Large capacity – anywhere from 500 – 5,000 people can be accommodated. • Self-contained – all support services are onboard and do not rely upon shore services. • Most have medical support on board. • Good short-term option while longer solutions put in place. • Good option to move large groups to a safe, anchored location or for relocation. 	
Disadvantages	<ul style="list-style-type: none"> • Food supplies would need to be maintained. • Cost. • Ability to dock after damage to ports – transported to vessel in smaller boats. • Need to have empty cruise ships available in the Pacific region. • Requires bulk fuel supply. • Not an immediate solution, as takes time to establish. 	

Providing shelter

Response Option	Establish “tent and/or campervan cities”	
Feasibility	MED LOW	Possible if tents, caravans, campervans and temporary shelters are available and supporting infrastructure is established.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Not a long-term solution. • Risk of disease outbreaks / community illness due to poor accommodation and close proximity. • Severe or poor weather. • Safety and security risks. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to source tents and other forms of shelter (campervans, tarps etc) to provide to the community who do not have anything. • CDEM to establish areas for tents / campervans etc including provision of sanitation. • Support resources such as security, water etc to be sourced by CDEM. • Other welfare agencies / local authorities to help establish sites. 	
Advantages	<ul style="list-style-type: none"> • Provides quick solution for accommodation in the short term. • Can keep the majority of displaced persons in the same area. • There are over 30,000 campervans in NZ with their own solar power generation, cooking and sleeping facilities, and some have in built WASH facilities. 	
Disadvantages	<ul style="list-style-type: none"> • Needs a huge amount of resource, which is unlikely to be available immediately unless people provide their own. • Tents are susceptible to bad weather. • Difficulties moving campervans between regions if transport infrastructure is damaged. • Poor living conditions may promote community illness in tent cities. • Would need some support infrastructure in place. • Potential for security issues. • Unlikely to be able to house pets with owners if using only tents. 	

Provision of food and water

Response Option	Set up food bank/bolster food banks in the region	
Feasibility	HIGH	Possible if facilities able to be established. Evidenced through COVID-19 event.
Risks and vulnerabilities	<ul style="list-style-type: none"> Facilities used by food banks may be damaged beyond repair (if so, consideration of new foodbank locations required). Where there has been significant damage, it may be hard for the population to travel to foodbanks or the foodbank to deliver out to communities. 	
Key Tasks	<ul style="list-style-type: none"> CDEM to contact regional food banks and work with them to increase their capacity and capability (i.e. addition of more volunteers). Where there are no foodbanks, CDEM to secure facility, food source and delivery mechanism for food parcels. 	
Advantages	<ul style="list-style-type: none"> Bolstering existing systems is time efficient and may ease logistics pressures on CDEM Groups. Where foodbank facilities don't require repair, immediate welfare needs are able to be met quickly. 	
Disadvantages	<ul style="list-style-type: none"> Adds further pressure on foodbanks to service larger population. Most foodbanks don't deliver. Delivery mechanisms may need to be put in place. Difficult to cater to some dietary / health needs with food bank stocks. Some foodbanks are located in tsunami inundation zones. 	

Response Option	Deliver standardised food packages utilising existing regional supply chain	
Feasibility	HIGH	Possible if supply chain can be established. Evidenced through COVID-19 event.
Risks and vulnerabilities	<ul style="list-style-type: none"> Damaged road networks may mean food packages may only reach some communities. Delivery reach may be limited by road damage. Where panic buying occurs, regional 'dark' supermarkets/stores may need to be explored (Dark stores are those which are shut to the public to allow focussed packing of standardised food packs). 	
Key Tasks	<ul style="list-style-type: none"> CDEM to develop standardised grocery and household goods 'shopping lists'. CDEM to contact local supermarkets/food suppliers and delivery companies to establish and secure a regional supply chain. 	
Advantages	<ul style="list-style-type: none"> Leverages off existing supply chains and food delivery mechanisms to lighten the CDEM Logistics load. Easy to quickly scale up. 	
Disadvantages	<ul style="list-style-type: none"> Heavy logistical requirement on CDEM Groups. Difficult to cater to some dietary / health needs with standardised packages. Some food suppliers/supermarkets are located in tsunami inundation zones. 	

Provision of food and water

Response Option	Use water and milk tankers	
Feasibility	HIGH	Possible to use water tankers and milk tankers (once cleaned) to provide drinking water.
Risks and vulnerabilities	<ul style="list-style-type: none"> Any impurities within the water supply will be transmitted to the community. Requires roads to be accessible. 	
Key Tasks	<ul style="list-style-type: none"> CDEM to work with Fonterra etc to source tankers and identify locations for community to access them. Local Authorities to provide water source for filling. 	
Advantages	<ul style="list-style-type: none"> Can provide clean water to population. Ready supply of tankers within most regions. 	
Disadvantages	<ul style="list-style-type: none"> Need roads to be clear to access communities. Milk tankers need to be cleaned before they can be used for potable water. Impacts on the collection of milk. Requires drivers. 	

Response Option	Temporary extraction from rivers / bores with primary treatment	
Feasibility	HIGH	Possible using portable pumps or existing drinking water infrastructure.
Risks and vulnerabilities	<ul style="list-style-type: none"> Contamination in the water supply. Lack of resources to treat the water. 	
Key Tasks	<ul style="list-style-type: none"> Local Authorities to setup emergency water supplies. 	
Advantages	<ul style="list-style-type: none"> Readily available sources of water. Primary treatment can be done by boiling or purification tablet. 	
Disadvantages	<ul style="list-style-type: none"> Potential for water born disease outbreaks if contaminated. Water needs to get from extraction point to residents, or establish collection points. Lack of resources for treatment. 	

Provision of food and water

Response Option	Establish community food kitchens	
Feasibility	HIGH	Possible using existing facilities such as commercial kitchens / community halls etc.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Lack of food supply. • Community illness from food contamination. • Lack of people to cook / resources for mass catering. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to ensure supply of food to communities to support food kitchens. 	
Advantages	<ul style="list-style-type: none"> • Community leads supply of food. • Catering is in a single place – supply more easily controlled. 	
Disadvantages	<ul style="list-style-type: none"> • Demand is likely to be high requiring extensive food supply. • Hygiene will be difficult to control without additional resources. • Could result in community illness. 	

Response Option	Use restaurants and catering facilities to prepare emergency meals	
Feasibility	HIGH	Possible as long as facilities available for cooking.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Requires food to be resourced/food supply to be available. • Community illness from food contamination. • Lack of facilities to cook / resources for mass catering. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to establish supply to caterers and restaurants. 	
Advantages	<ul style="list-style-type: none"> • Facilities setup for mass catering. 	
Disadvantages	<ul style="list-style-type: none"> • High demand will require numerous facilities. • Need utilities to operate safely. 	

Provision of food and water

Response Option	Emergency food rationing	
Feasibility	MED	Possible but difficult to implement and control.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Requires control of suppliers and retailers. • Potential some go without or nutritional needs not met. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to establish control of supply and implement rationing system. 	
Advantages	<ul style="list-style-type: none"> • Controls the amount of good people can purchase to enable supplies to last longer. 	
Disadvantages	<ul style="list-style-type: none"> • Hard to implement. • Likely there will be very limited food supplies available early on. 	

Response Option	De-salinisation plants	
Feasibility	LOW	Possible, but limited availability in NZ
Risks and vulnerabilities	<ul style="list-style-type: none"> • Required to be setup near the sea – further tsunami activity could destroy them. 	
Key Tasks	<ul style="list-style-type: none"> • Where available CDEM Group to establish de-salinisation plants in areas with most need (refer Wellington Water Project). 	
Advantages	<ul style="list-style-type: none"> • Readily available source of drinking water. • Can be located in coastal areas with most need or to re-fill tankers. • Portable. • Can run off a generator. 	
Disadvantages	<ul style="list-style-type: none"> • Some desalination plants produce limited supplies of water. • Lack of resource in New Zealand. • Most coastal areas impacted by tsunami will be evacuated long term so no need for drinking supply. • Require a generator or power supply if not solar powered. • Further tsunami activity may destroy the resource. 	

Developing situational awareness

Response Option	Wide area assessments by drone	
Feasibility	HIGH	Possible. Numerous drones available for use within CDEM Group partner agencies.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Privacy in urban areas/high density residential areas. • CCA rules. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to establish areas for collection of information and resources to conduct. • Agencies with drones to support information gathering. 	
Advantages	<ul style="list-style-type: none"> • Limited risk to personnel. • Can cover wide area efficiently. • Battery operated. • Can get close to severe damage etc. 	
Disadvantages	<ul style="list-style-type: none"> • Need recharging. • Limited range (average 3km). 	

Response Option	Wide area assessments by vehicle	
Feasibility	MED LOW	Possible if access routes clear.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Personnel entering high risk areas. • Requires fuel, which may be a limited critical resource during response. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to establish areas for collection of information and resources to conduct. • Agencies with vehicles to support information gathering. 	
Advantages	<ul style="list-style-type: none"> • Quick to conduct. • Assessment at ground level. • Can assist / inform people during the process. 	
Disadvantages	<ul style="list-style-type: none"> • Needs access routes to be clear. • Requires personnel and vehicles / fuel. 	

Developing situational awareness

Response Option	Wide area assessments by aircraft	
Feasibility	MED	Possible if facilities available for take-off / landing.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Aircraft accident. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to establish areas for collection of information and resources to conduct. • NZDF to support information gathering. 	
Advantages	<ul style="list-style-type: none"> • Ability to cover large areas quickly with single resource. 	
Disadvantages	<ul style="list-style-type: none"> • Requires aircraft / pilots to be available and facilities operational for take-off and landing. • Requires Av-gas supplies. 	

Response Option	Wide area assessments on foot	
Feasibility	MED	Possible.
Risks and vulnerabilities	<ul style="list-style-type: none"> • High risk to personnel entering impacted areas. 	
Key Tasks	<ul style="list-style-type: none"> • CDEM to establish areas for collection of information and resources to conduct. • Agencies with available personnel to support information gathering. 	
Advantages	<ul style="list-style-type: none"> • Requires minimal resources other than personnel. 	
Disadvantages	<ul style="list-style-type: none"> • Slow to conduct. • Requires transport to impacted areas. • Requires a large number of personnel. • Puts people at risk in impacted areas. 	

Managed evacuation and exclusion

Response Option	Fully fenced and staffed cordons	
Feasibility	HIGH	Possible if resources available.
Risks and vulnerabilities	<ul style="list-style-type: none"> Requires personnel to control. 	
Key Tasks	<ul style="list-style-type: none"> CDEM to establish areas for evacuation and exclusion and resources to support cordon management. NZ Police to support evacuation and cordon management. Local Authorities to support cordon management. 	
Advantages	<ul style="list-style-type: none"> Controls access into dangerous areas. 	
Disadvantages	<ul style="list-style-type: none"> Requires huge resource to establish. Not feasible if large areas impacted. 	

Response Option	Roadblocks	
Feasibility	HIGH	Possible – can be done with a variety of resources.
Risks and vulnerabilities	<ul style="list-style-type: none"> Population can still access at risk areas. 	
Key Tasks	<ul style="list-style-type: none"> CDEM to establish areas for exclusion and resources to support roadblocks. NZ Police to support exclusion zone management. Local Authorities to support implementation of roadblocks. 	
Advantages	<ul style="list-style-type: none"> Quick to establish – can be done with vehicles, debris or personnel. Can be established for larger areas. 	
Disadvantages	<ul style="list-style-type: none"> Doesn't completely control access to impacted areas. Key routes need to be staffed to enable movement of response vehicles past cordons into impacted areas. 	

Managed evacuation and exclusion

Response Option	Patrolling of exclusion zones	
Feasibility	MED	Possible.
Risks and vulnerabilities	<ul style="list-style-type: none"> • Response personnel in high risk areas. 	
Key Tasks	<ul style="list-style-type: none"> • NZ Police to coordinate patrol and security of exclusion zones. • CDEM to support patrols and security with additional resources. 	
Advantages	<ul style="list-style-type: none"> • Doesn't require physical barriers. • Police presence will limit security issues. 	
Disadvantages	<ul style="list-style-type: none"> • High resource demand. • Requires routes through areas to be accessible. • Puts response personnel in potential danger. 	

2.9 Response Risk Register

This section includes a response risk register, designed as a starting point to be adapted by CDEM Groups for use when responding to a large Hikurangi event. The risk rating has been derived using the risk matrix (Table 9, p 42) in NEMA's Risk Assessment Guidance DGL (currently under consultation for publication in 2020), and risks are categorised to the response phases.

	Risk Description	Likelihood	Consequence	Risk Description	Applicable Response Phase		
		Risk Rating			1	2	3
Response Personnel risks							
1	Not enough response personnel available to staff coordination centres to the required level.	Almost certain	Major	As part of readiness ensure enough staff are adequately trained to meet the needs of the CDEM Group. Identify surge staff requirements and be prepared to undertake on-the-job or last-minute training to increase response staff capability & capacity	✓	✓	✓
		Critical					
2	The response having a negative effect on response personnel mental health.	Likely	Major	Ensure resources to support mental health (e.g. brochures, free phone counselling line) are frequently advertised to response staff. Identify support options for staff and investigate the ability to have staff support services represented in person where telecommunications are not available.	✓	✓	✓
		Very high					
3	Response personnel fatigue.	Possible	Major	Ensure staff are rotated and external resourcing need are escalated early to the NCMC.	✓	✓	✓
		Very high					
4	Response staff risking their/others safety to get to response coordination facilities.	Unlikely	Extreme	As part of readiness ensure response staff are aware of alternate facilities they can assist at and expectations on them to report to these.	✓	✓	
		Very high					
Coordination facility risks							
5	Staff enter coordination facilities to coordinate the response before they are assessed as safe to occupy.	Likely	Extreme	As part of readiness ensure coordination facilities are prioritised for building assessment and staff know not to enter before an assessment. Assessments to occur following aftershocks again as appropriate.	✓		
		Critical					
6	The impacts of the earthquake and/or tsunami affect the facilities available at coordination centres, not complying with H&S legislation e.g. access to drink making facilities and toilets.	Likely	Moderate	If facilities are compromised, ensure alternatives are provided ASAP, e.g. generator supply for preparation of food/drink and portaloos for staff.	✓	✓	✓
		Very high					
7	The capacity of coordination facilities are overwhelmed by the number of agencies/staff required to coordinate the response.	Possible	Moderate	Monitor the use of the coordination facility and ensure only necessary staff are present. As part of readiness, develop security procedures to ensure members of the public cannot access facilities.	✓	✓	✓
		High					

	Risk Description	Likelihood	Consequence	Risk Description	Applicable Response Phase		
		Risk Rating			1	2	3
Operational risks							
8	The ongoing risk of aftershocks and tsunami presents a risk to responders working in areas at risk of these secondary hazards.	Almost certain	Extreme	Emergency services to assess the health and safety risks associated with their operational activities. Where CDEM volunteers/ staff are used in hazard zones, a comprehensive H&S risk assessment is to be completed.	✓	✓	✓
		Critical					
9	In severely affected regions, the Group does not have the capacity and capability to ensure the immediate and basic needs of all affected are met, resulting in worsening health and wellbeing outcomes for those impacted.	Likely	Extreme	As part of readiness, identify ways the Group could meet the immediate and basic needs of those affected to reduce the 'gap'.	✓	✓	
		Critical					
10	Members of the public re-enter cordons to rescue loved ones, check homes or collect possessions when it is unsafe to do so.	Likely	Major	Ensure cordons are staffed to restrict entry by the public. Due to the scale of the event it is likely cordons will need to be prioritised for security resourcing according to where the greatest threat to life is.	✓	✓	
		Very high					
11	Due to a lack of telecommunications, some response activities are not coordinated leading to duplication of effort.	Likely	Moderate	Prioritise coordination of emergency services and establishment of alternate comms between agencies during the initial response.	✓	✓	
		Very high					
12	Staff enter coordination facilities to coordinate the response before they are assessed as safe to occupy.	Almost certain	Moderate	Where able and appropriate, consider the environmental impact of response activities.	✓		
		Very high					
13	Loss of response-critical infrastructure that prevents response outcomes.	Likely	Major	As part of readiness identify how to improve the resilience of response-critical infrastructure. Ensure there are practical contingencies in place for response-critical infrastructure.	✓	✓	
		Very high					
14	National coordination and prioritisation of resources and effects go to higher priority regions.	Possible	Moderate	Prepare consistent messaging to help manage community expectations regarding resource allocation.	✓	✓	✓
		High					
15	Inability to communicate or coordinate with adjacent regions.	Possible	Moderate	As part of readiness identify alternate communication means between regions and test these systems regularly.	✓	✓	✓
		Very high					

	Risk Description	Likelihood	Consequence	Risk Description	Applicable Response Phase		
		Risk Rating			1	2	3
Operational risks (continued)							
16	Isolated community needs unable to be responded to.	Possible	Extreme	<p>As part of readiness ensure communities which are likely to be isolated have community resilience plans and targeted education regarding hazard preparedness.</p> <p>Identify communities which are likely to be isolated as part of response planning and scope contingency options to respond to community needs.</p>	✓	✓	✓
		Very high					
Communication risks							
17	Due to a lack of telecommunications, severely affected CDEM Groups are unable to warn and inform public about hazards.	Likely	Extreme	As part of readiness determine how to appropriately warn and inform communities when telecommunications are not available.	✓	✓	
		Critical					
18	The public lose confidence in the response.	Possible	Moderate	Ensure information is delivered in a timely and accurate manner to communities using the resources available.	✓	✓	✓
		High					
19	The media negatively portray or criticise response efforts feeding into risk 14	Possible	Major	Engage with media early on in response and develop a comms plan to respond and address criticisms appropriately.	✓	✓	✓
		Very high					

2.10 Public Information and Education to support response

The following key messages and resources were developed following a 'Risk Communication' workshop held by East Coast Life at the Boundary with subject matter experts as part of the Hikurangi Response Planning project.

They are designed to be used as part of readiness and response, to help inform and educate communities at risk from a large Hikurangi event. Effective public information and education during readiness (and the response planning process) will support any response to achieve good outcomes for 'at risk' communities, as a result of increased preparedness and increased natural hazard literacy.

KEY TOPIC (1): "Let's Talk about our earthquake and tsunami risk"

- All of Aotearoa New Zealand is at risk of earthquakes and all of our coasts are at risk of tsunami.
- A Hikurangi subduction zone earthquake would affect many regions in Aotearoa New Zealand, similar to the earthquake and tsunami that occurred in Japan 2011.
- Subduction Zones are where two tectonic plates meet and one plate subducts (dives) under the other. Subduction zones develop a type of fault that is responsible for the largest earthquakes and tsunamis in the world.
- It is a case of 'when' not 'if', but we can't predict when the Hikurangi Subduction Zone will next cause a major earthquake.
- In light of recent research, combined with learnings from the Kaikoura earthquakes, scientists believe the likelihood of a Hikurangi Subduction Zone Earthquake is higher than initially understood.
- A Hikurangi subduction zone earthquake and tsunami event has the potential to be as or more severe than Japan, 2011.
- The areas worst impacted along the East Coast would depend on where the earthquake occurs.

KEY TOPIC (2): "We need to work together to prepare for future events"

- We are building a coordinated response plan; this is the start of a journey and every step we take helps us prepare and build resilience.
- Communities are at the centre point of all response planning.
- You can get involved in local community resilience planning in your area. Make contact with your local Civil Defence Group to get started.
- A range of scientific scenarios have been developed specifically to inform and support the planning process.
- A real Hikurangi Subduction Zone earthquake and tsunami could occur in many ways, therefore it is important for all communities to prepare accordingly.
- It is likely a Hikurangi Subduction Zone earthquake would have impact for all New Zealanders, so it is important that we all understand the risks and know how to prepare.
- The Hikurangi Response Planning Toolbox is being developed collaboratively with input from Local Government, Central Agencies, Civil Defence and some of New Zealand's top scientists.
- Infrastructure providers, emergency services, hospital and health, non-government organisations, university experts and representatives of communities and key business sectors are also involved in the process.

KEY TOPIC (3): "It might sound overwhelming, but here are the things we must all do to be prepared"

- In a long or strong earthquake, get gone. Move immediately to the nearest high ground, or as far inland as you can. Walk or bike if possible.
- Practice your drop, cover and hold at home and at work.
- It is important to have a household plan. <http://getthru.govt.nz/assets/Uploads/GRG-Checklist.pdf>
- Fix. Fasten. Don't Forget. www.eqc.govt.nz/be-prepared
- Participate in Aotearoa, New Zealand's annual Shake Out & Tsunami Hikoi week.
- Earthquake damage will influence evacuation routes so plans need to be made accordingly. www.shakeout.govt.nz

KEY TOPIC (4): Credible scenario specific key messages

- While scientists cannot predict how the Hikurangi subduction zone might behave, they have chosen a magnitude 8.9 scenario as being a serious and credible basis for the response plan.
- Scenarios are used by emergency planners to help them determine likely impacts, response priorities and resource requirements during an event, such as an earthquake and tsunami.
- Scenarios are useful tools for emergency planners but they do not represent or predict what will happen in the future: there is no way to predict what the next Hikurangi subduction zone earthquake and tsunami will look like.
- Several experts have developed an ‘exercise scenario’ for Hikurangi Response Planning. This describes possible impacts and locations that are affected by the earthquake and tsunami. This information has been developed for the purpose of testing the response plan, and is not a prediction of future impacts and locations affected.
- Gisborne would experience particularly severe and long-lasting shaking in this scenario due to the thick sedimentary rocks in the area which increase the size and duration of ground motion.

KEY TOPIC (5): Aftershock scenario specific key messages

- After a large earthquake such as a magnitude 8.9 earthquake, aftershocks are expected to occur for years following an earthquake.
- At first, aftershocks may feel as big as the first earthquake and then the number and strength of the aftershocks will decrease over time. They may cause further damage to buildings and other infrastructure and make them unsafe to live in or use.
- Aftershocks can trigger landslides and liquefaction, and if they occur offshore and are large enough, tsunami.
- It is important that everyone drop, cover, holds before evacuating to higher ground or inland if they experience a long or strong earthquake or aftershock.
- Aftershocks will likely slow response across those areas significantly impacted by the semi-continuous series of aftershocks in the first few weeks.
- Aftershocks will also likely impact recovery as well. A year after the first earthquake there is still a significant (about 50%) probability of an Mw 7 or greater earthquake over the following year – this has the potential to cause a tsunami.

**Appendix A:
 Reference material**

Tsunami Hikoi Resources

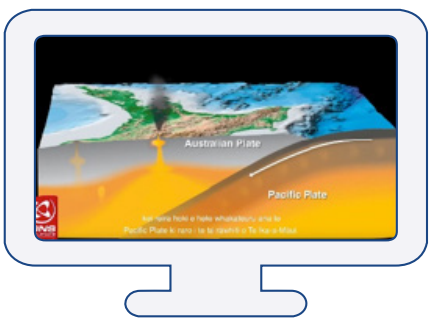
Visit this website for the latest Tsunami Hikoi resources:
www.eastcoastlab.org.nz/getinvolved/tsunami-hikoi

Educational videos for engagement

The following videos have been developed as part of Hikurangi Response Planning to help inform communities about their risk and what they can do to increase their resilience to a large Hikurangi event. Visit the East Coast LAB YouTube channel to access the videos below:



**1. The Hikurangi subduction zone:
 What is it and how can you prepare?**



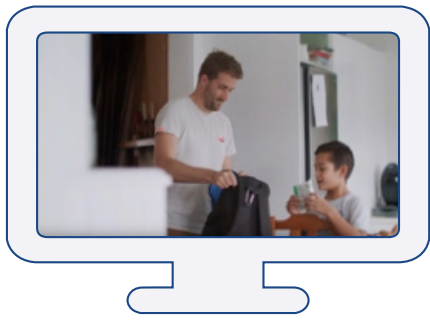
**2. Scientists perspectives on the
 Hikurangi subduction zone**



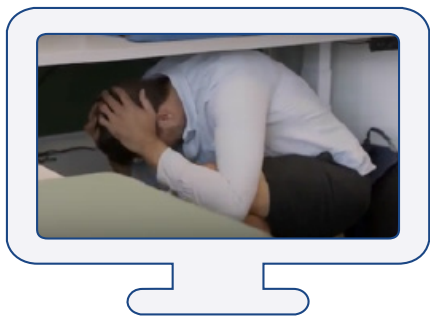
**3. The Hikurangi subduction zone: A credible
 magnitude 8.9 earthquake and tsunami scenario**



**4. Earthquakes and tsunami during
 school time: Do you know the plan?**



**5. Earthquakes and tsunami:
 Are you prepared at home?**



**6. Earthquakes and tsunami:
 Are you prepared at work?**



**7. Earthquakes and tsunami:
 Is your business prepared?**

Appendix A: Reference material

Exercise injects for a Hikurangi Subduction Zone earthquake aftershock sequence

eastcoastlab.org.nz/assets/Uploads/CR2019-130-ECLabs-Aftershock-Report-FINAL.pdf

Burbidge et al. (2019)

Geological evidence for past large earthquakes and tsunamis along the Hikurangi subduction margin, New Zealand.

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Clark et al. (2019)

Hikurangi Response Planning 'Risk Communication Workshop' report

East Coast LAB (2019)

Hikurangi Response Planning FAQs

eastcoastlab.org.nz/assets/Uploads/FREQUENTLY-ASKED-QUESTIONS-Scenario.pdf

East Coast LAB (2019)

Rapid disaster relief: Responding to people's needs in a catastrophe – how would New Zealand cope?

eastcoastlab.org.nz/assets/Uploads/RAPID-DISASTER-RELIEF-Responding-to-peoples-needs-in-a-catastrophe-how-would-New-Zealand-cope.pdf

Hawke's Bay CDEM Group (2019)

Vulnerable: The quantum of local government infrastructure exposed to sea level rise

www.lgnz.co.nz/assets/Uploads/d566cc5291/47716-LGNZ-Sea-Level-Rise-Report-3-Proof-FINAL-compressed.pdf

LGNZ (2019)

National Disaster Resilience Strategy

<https://www.civildefence.govt.nz/cdem-sector/plans-and-strategies/national-disaster-resilience-strategy/>

NEMA (2019)

CIMS 3rd Edition

<https://www.civildefence.govt.nz/cdem-sector/plans-and-strategies/national-disaster-resilience-strategy/>

ODESC (2019) (Referred in text as CIMS 3rd Edition)

The SAFER Framework, Emergency Management Southland

<https://projectaf8.co.nz/wordpress/wp-content/uploads/2018/09/af8-safer-framework-sept18-lr.pdf>

AF8 SAFER (2018)

Quicker and safer tsunami evacuations through agent-based modelling

http://shop.gns.cri.nz/ms_134-pdf/

Power et al. (2019)

Hikurangi Response Plan – Developing a scenario for an Mw8.9 Hikurangi earthquake, including tsunami modelling and a preliminary description of impacts

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Power et al. (2018)

Wellington Earthquake National Initial Response Plan

<https://www.civildefence.govt.nz/cdem-sector/guidelines/wellington-earthquake-national-initial-response-plan/>

The Wellington Region Earthquake Plan

(WREP) WREMO (2018)

New Zealand Lifelines Infrastructure Vulnerability Assessment: Stage 1 September

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A Vulnerability Assessment of Lifelines Infrastructure in Manawatu Whanganui

Manawatu-Whanganui Lifelines Project (2016)

Estimates of probable maximum loss for the EQC portfolio. Lowe Hutt (NZ): GNS Science. 64p. (GNS Science consultancy report; 2016/43)

Horspool et al. (2016)

National and regional risk-exposure in low-lying coastal areas: Areal extent, population, buildings and infrastructure.

NIWA Client Report HAM2015-006 prepared for the Parliamentary Commissioner for the Environment. October, 270p.

<https://www.pce.parliament.nz/media/1384/national-and-regional-risk-exposure-in-low-lying-coastal-areas-niwa-2015.pdf>

Bell et al. (2015)

Guide to the National CDEM Plan 2015

<https://www.civildefence.govt.nz/assets/guide-to-the-national-cdem-plan/Guide-to-the-National-CDEM-Plan-2015.pdf>

NEMA (2015)

DGL 11/15: Welfare Services in an Emergency

<https://www.civildefence.govt.nz/assets/response-planning-cdem/Response-Planning-in-CDEM-Directors-Guideline.pdf>

NEMA (2015)

Response Planning in CDEM DLG 19/15

<http://documents.worldbank.org/curated/en/478711468038957554/pdf/Learning-from-Megadisasters-lessons-from-the-great-east-Japan-earthquake.pdf>

NEMA (2015)

Recent Advances in Agent-Based Tsunami Evacuation Simulations: Case Studies in Indonesia, Thailand, Japan and Peru

<https://link.springer.com/article/10.1007/s00024-015-1105-y>

Mas et al. (2015)

Learning from Megadisasters

<http://documents.worldbank.org/curated/en/478711468038957554/pdf/Learning-from-Megadisasters-lessons-from-the-great-east-Japan-earthquake.pdf>

The World Bank (2014)

Review of tsunami hazard in New Zealand (2013 update). Lower Hutt (NZ): GNS Science. 222p (GNS Science Consultancy report; 2013/131)

Power (2013)

Restoring Wellington's transport links after a major earthquake

www.gw.govt.nz/assets/Emergencies--Hazards/Lifelines/13-03-23-Transport-Access-full-project-report-FINAL-corrected.pdf

Wellington Lifelines Group (2013)

Case Study Report: 2010 Canterbury and 2011 Christchurch Earthquakes - Demolition and Disaster Waste Management,

ir.canterbury.ac.nz/bitstream/handle/10092/7038/Appendix%20K.CBrown.pdf;sequence=12

Brown and Mike (2012)

Lifeline Utilities Restoration Times for Metropolitan Wellington Following a Wellington Fault Earthquake

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Diverse Slow Slip Behaviour at the Hikurangi Subduction Margin, New Zealand

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<http://www.legislation.govt.nz/act/public/2002/0033/51.0/DLM149789.html>

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Report of the Hawke's Bay, Facing the Risks, Engineering Lifelines Report,

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Hawke's Bay Engineering Lifelines (2001)



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HIKURANGI

RESPONSE PLANNING

LIFE AT THE BOUNDARY

ANNEX A

**REGIONAL
RESPONSE
CONCEPT
PAPERS**

July 2020





EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

BAY OF PLENTY CDEM GROUP

Hikurangi Subduction Zone Response Concept Paper 2020

Prepared by
East Coast Life at the Boundary (ECLAB)

Approved by:

Control Copy no:

**EMERGENCY
MANAGEMENT**
Bay of Plenty
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LIFE AT THE BOUNDARY

SECTION 1

INTRODUCTION

**EMERGENCY
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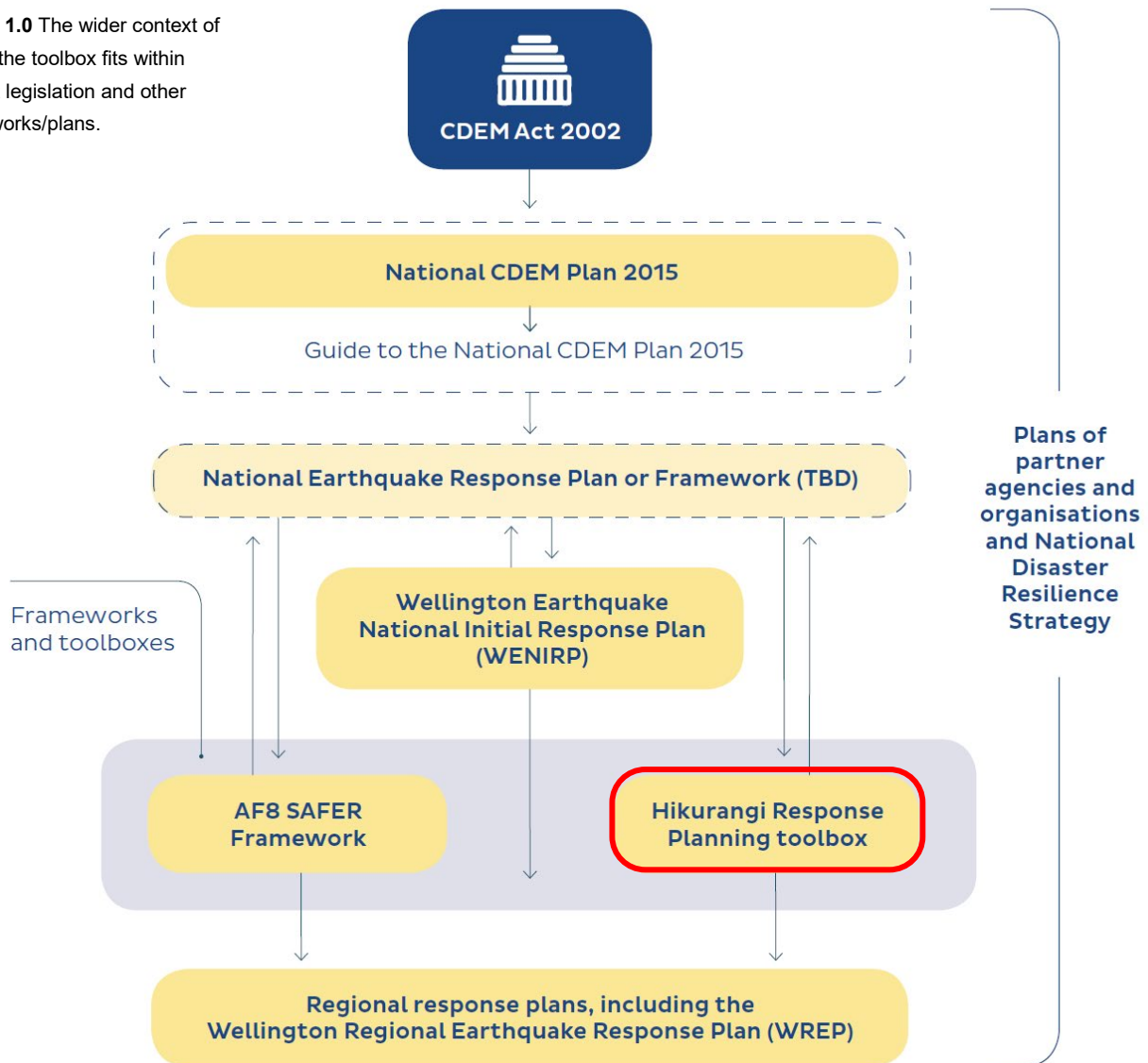


1.0

Purpose of the document

The purpose of this document is to outline the proposed response arrangements within the Bay of Plenty region to guide the response to a large earthquake and tsunami generated from the Hikurangi Subduction Zone in advance of any planning under a national earthquake and tsunami framework (TBD). This 'Regional Response Concept Paper' intends to provide a basis and starting point for regional response planning for a large Hikurangi event and fits within the Hikurangi Response Planning toolbox as pictured below (Figure 1.0).

Figure 1.0 The wider context of where the toolbox fits within current legislation and other frameworks/plans.



1.1

Scope

This concept paper is designed to be a guide for the Bay of Plenty CDEM response to a large earthquake and tsunami. It has used a credible magnitude 8.9 earthquake and tsunami planning scenario as a tool to aid planning. While many of the arrangements in this plan may be applicable to a range of events, there may be some requirement to modify or develop new arrangements for some events.

1.2

Legislative arrangements

The initiation of any response will be supported by several key pieces of New Zealand legislation:

- Civil Defence and Emergency Management Act 2002
- Health and Safety in the Workplace Act 2017
- Fire and Emergencies Act 2017
- Police Act 2008

1.3

Supporting plans and documents

This paper is reliant upon other plans to be enacted in support. This includes arrangements for coordination, evacuation, welfare provision and lifeline utilities. The following plans should be used to support the implementation of this response plan:

- Bay of Plenty CDEM Group CDEM Group Plan
- Bay of Plenty CDEM Group Recovery Plan

1.4

Audience

This plan is intended to provide response guidance to the following audience:

- Bay of Plenty CDEM Group Members, namely:
- Tauranga City Council
- Western Bay of Plenty District Council
- Rotorua Lakes District Council

- Whakatāne District Council
- Kawerau District Council
- Ōpōtiki District Council
- Bay of Plenty Regional Council
- The Emergency Services
- Bay of Plenty District Health Board
- Regional Welfare providers
- Government agencies including; New Zealand Transport Agency (NZTA), Ministry of Business, Innovation and Employment (MBIE), Ministry of Primary Industries (MPI), Department of Corrections
- Lifeline utility providers
- Bay of Plenty Iwi and other Tangata Whenua (Including post-settlement Groups).

1.5

Review

This concept paper will inform the proposed National Emergency Management Agency National Earthquake and Tsunami Response Framework. Nevertheless, depending on national framework progress this paper may be reviewed every five years, or as necessary, should any information regarding the implementation of any aspects of the response contained within change.

1.6

Exercising

This document will be exercised as part of the review process to ensure that the arrangements contained can be effectively implemented as required.

1.7 Response assumptions

In order to enable effective planning several assumptions have been made regarding coordination of the event at a national level, availability of resources, the ability to respond, and the activities of the community. The core assumptions regarding this event are listed below. A more detailed description of these assumptions is shown in Appendix A.

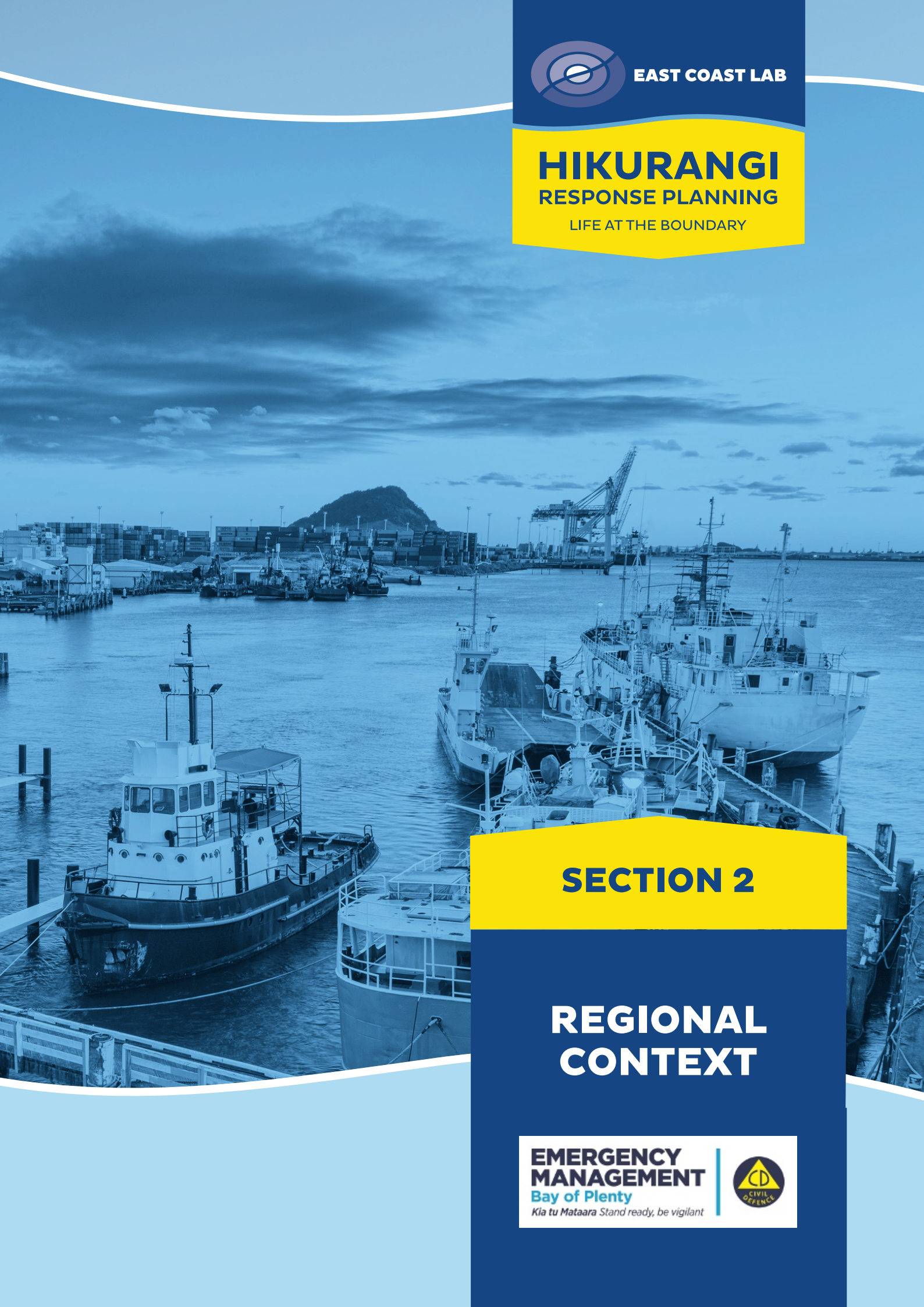
- The process of declaring local states of emergency will be initiated immediately.
- A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.
- CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.
- The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.
- Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.
- Local Government within the North and South Island will continue to operate but with reduced capacity and capability
- Responding agencies will be functional but operating with reduced capacity and capability.
- Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.
- Standard communications will be limited, where available, alternate communications will be used.
- Lifeline utilities will be limited or unavailable in the five CDEM Groups.
- Movement corridors will be affected, and many roads will be unusable.
- Rail will be inoperable within the five CDEM Groups.
- Airports may suffer earthquake and tsunami damage.
- Ports will be impacted by the earthquake and tsunami.
- Health and welfare services will be overwhelmed.
- Communities will be isolated.
- Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.
- Depending on the time of day significant numbers will be displaced from their home locations.
- The community led and Tangata Whenua response will work to meet communities immediate and basic needs where possible.
- Ordered mass-evacuation will not automatically occur.
- There will be significant and long-term environmental impacts.
- National and regional assembly areas will be established in accordance with national and regional plans.
- Offers of international assistance will be made and coordinated through the NCMC.



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SECTION 2

REGIONAL CONTEXT

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2.0

Regional overview

Population

The Bay of Plenty region is in the upper North Island of New Zealand and borders the Waikato region to the west and the Gisborne Region to the east. The Bay of Plenty coastline faces in a predominantly northern direction. The region has two main centres of population in Tauranga and Rotorua, with several smaller towns in the east of the region.

The region has a population of approximately 308,500 (NZ Census data 2018) with around 18% of the regional population living within the tsunami evacuation zones. Most of the population lives in the Western Bay of Plenty, Tauranga City and the Rotorua Lakes District, with approximately 137,000 people living in the Tauranga City and surrounds and 71,000 living in Rotorua and surrounds. The Eastern Bay of Plenty has one main township in Whakatane (approximately 25,000) and two other smaller townships in Opotiki (approximately 7,500) and Kawerau (Approximately 6500).

The night-time populations for areas within the tsunami evacuation zones are:

Location	Estimated population exposure to tsunami (Night time)
Tauranga	35,787
Western BOP	7,787
Whakatane	8,359
Ōpōtiki	3,970
Total	55,903

Approximately 21% of the population is aged under 14 years of age. 13% of the population in Bay of Plenty is aged 70 or more.

Local Government

The region has seven territorial authorities and one regional authority, as shown below:

- Tauranga City Council
- Western Bay of Plenty District Council

- Rotorua Lakes District Council
- Whakatāne District Council
- Ōpōtiki District Council
- Kawerau District Council
- Bay of Plenty Regional Council.

Economy

The primary industries within the region are forestry and manufacturing, which make up almost 20% of the regional GDP. Agriculture also plays a large part in the regional economy.

Tourism is a very important sector within the region, particularly in areas such as Rotorua, Whakatane and Mt. Maunganui.

Lifelines

The region is served by five main state highways and three interconnecting state highways between Rotorua and Tauranga. These are detailed below:

State Highway (SH)	Main connections
SH2	Gisborne to Tauranga via Ōpōtiki and Whakatāne
SH5	Taupo to Rotorua
SH29	Hamilton to Tauranga
SH30	Taupo to Whakatāne via Rotorua
SH33	Rotorua to Tauranga
SH35	Gisborne to Ōpōtiki via East Cape
SH36	Rotorua to Tauranga
SH38	Taupo (from SH5) to Whakatāne via Murupara

In addition to road connectivity, the region has a major seaport in Tauranga and a smaller port in Whakatāne, and regional airports in Tauranga and Rotorua, with a smaller airport also in Whakatāne. Rail links connect the region west to Auckland via Hamilton from Tauranga. Rail also links from Taranga east to Kawerau and south to Murupara.

Electricity is supplied by high voltage lines from the from the south, east and west of the region, however some electricity is also generated within the region from several generating stations including:

- Kawerau Geothermal Plant (Mercury)
- Matahina and Aniwhenua Hydro stations (Trustpower)
- Small plants in the Kawerau area.

2.1 Planning scenario overview

This plan has used a credible planning scenario, developed by GNS Science (see Power et al., 2018), as a tool to develop the HRP Toolbox and this Regional Response concept paper. A high-level overview of the scenario is provided in the sections below. For further detail, please refer to Volume I of the HRP Toolbox (Appendix A) for the full scenario.

The earthquake

The planning scenario starts with a magnitude 8.9 earthquake on the southern portion of the Hikurangi Subduction zone. This is a realistic large earthquake that would impact most of the subduction zone and is slightly lower than the maximum plausible magnitude of Mw 9.0. Shaking in the Bay of Plenty region would be severe, between 7 and 8 on the modified Mercalli (MMI) scale and lasting for between 20 and 30 seconds. Landslides and liquefaction across the region would also be severe as a result of the shaking, cutting off access into the region from some parts of the country.

Offshore the quake would cause widespread uplift of the seafloor right out the trench of around 2 – 2.5m. This uplift would result in the creation of a series of tsunami.

It is likely that significant aftershocks would continue for many weeks and months after the initial event, with some aftershocks exceeding Mw 7.0 and possibly requiring sustainment of exclusion zones or further evacuations of the population.

The tsunami

The earthquake would create a series of tsunami waves, however the impacts of the tsunami would be minimal in the Bay of Plenty due largely to the protection provided by the East Cape. Wave heights in the planning scenario would be less than 1m and unlikely to cause inundation along the majority of the coast.

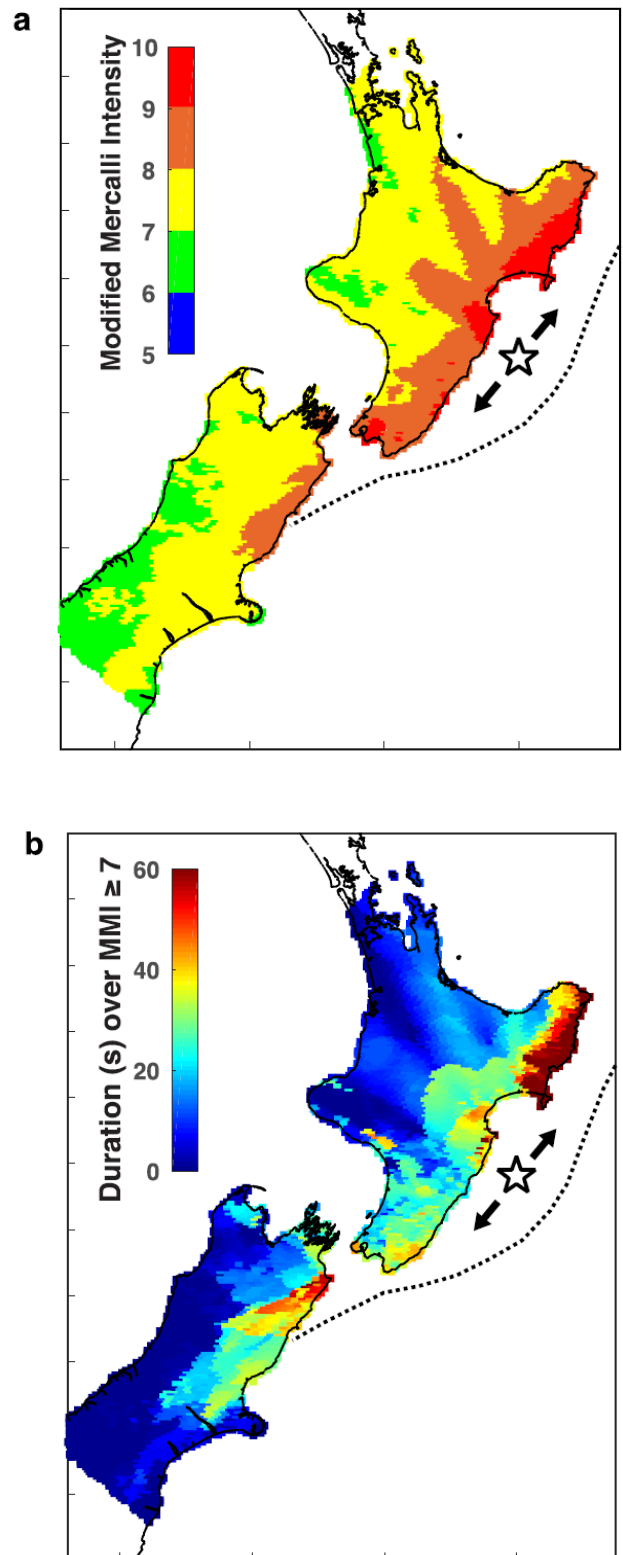


Figure 2.0 (a, b): Modelled (a) shaking intensity and (b) duration for the main scenario (Power et al., 2018)

Any tsunami activity along the Bay of Plenty coastline would be unlikely to be observed until 1hr+ following the initial earthquake.

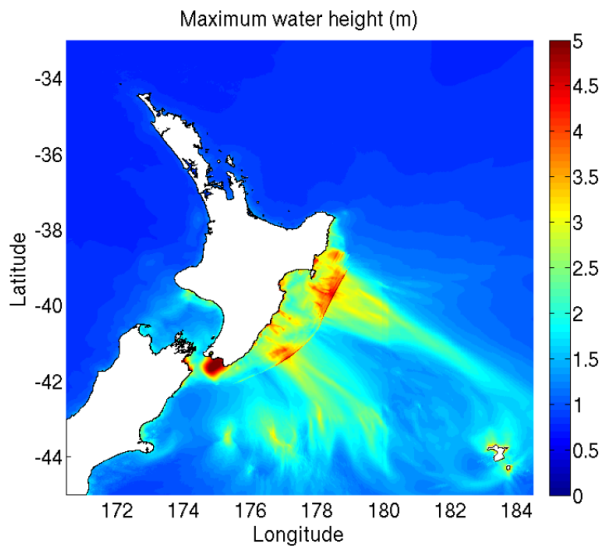


Figure 2.1: Modelled offshore water heights for New Zealand in the credible scenario (note, the scale is limited) (Power et al., 2018)

The impacts

Population

Widespread evacuation of coastal areas in the region would occur inland and to areas of high ground due to the strong nature of the shaking and unknown location. Landslides, liquefaction and infrastructure damage would make it difficult for some areas to easily evacuate post-quake.

The impacts of a Hikurangi earthquake and tsunami event would be potentially major for the population of Bay of Plenty. The earthquake would be unlikely to cause fatalities, but there would be numerous casualties with varying degrees of severity. The tsunami would be less likely to cause injuries or fatalities due to the small height of any waves in the credible planning scenario. Several hundred people would be unable to return to their homes throughout Bay of Plenty with many more thousands only having access to basic shelter and no access to utilities.

Tourists within the region will also require welfare support (accommodation, food etc.) following a large Hikurangi event. The support given to tourists will need to be coordinated with tourist companies, NZ customs, embassies and the Ministry of Foreign Affairs and Trade to ensure tourists are accounted for early in the response.

Built environment

Widespread landslides and liquefaction across the region would result in damaged roads and infrastructure. There would be widespread damage (some of which irreparable) to buildings within the region as a result of the earthquake.

Many state highways would suffer damage from landslides and liquefaction, isolating the region in some parts (in particular SH35 to East Cape). Several key bridges along SH routes would also be damaged and require repair to re-instate. The region would still be accessible, although it is likely that numerous slips would need to be cleared first. Road and bridge damage would be more severe in the East Cape, where the shaking intensity would be higher, and the age of the infrastructure would make it more susceptible to damage.

The Port of Tauranga would still be operable, although there may be some damage from the earthquake. A structural assessment of Port infrastructure would need to occur following the earthquake. There is likely to be some tsunami debris left floating in the harbour after the event, such as logs. These will pose significant maritime hazards as long as they remain floating in the harbour.

The Tauranga, Rotorua and Whakatāne Airports would be unaffected by the tsunami but may be damaged by the earthquake. They would still be usable to receive aircraft and helicopters following structural assessment.

Rail links into the region from the north, south and east would all be impacted and unlikely to be restored for a number of weeks.

Water and sewerage would all be damaged as a result of the quake, but restoration would be possible within weeks. Electricity would be restored to 80% of the community within 3 days. Telecommunications would be mostly unusable for at least a week. The gas network would also suffer damage and be inoperable for an extended period due to gas leaks and breakages within the network.

Alternative Scenarios

Several other scenarios were modelled to show the potential impacts to the region. These are shown in the GNS Science report. They included modelling a rupture of the fault further north from the above scenario, varying the slip distribution and a scenario focussing on a rupture in the area of strong coupling to the south of the Hikurangi zone.

In the alternative scenario modelled on a significant rupture in the north of the subduction zone, the Bay of Plenty region is significantly impacted by both the earthquake and the tsunami.

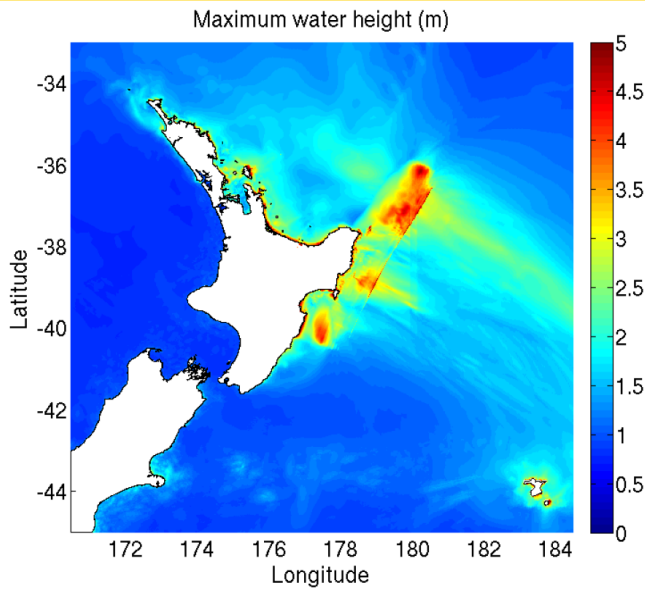


Figure 2.3: Scenario B modelled water heights for a rupture in the northern fault area (Power et al., 2018)

The impacts of the above scenario would likely result in far more damage from the earthquake shaking and tsunami inundation along the coast of the Bay of Plenty region with modelled wave heights over 5m. In scenario B, the first large wave arrives between about 50-55 minutes after the earthquake in Tauranga/Papamoa – note that the first waves may arrive *earlier* however in the eastern Bay of Plenty.

Population

It is highly likely that there would be fatalities and injuries to the population due to the inundation of coastal settlements by the tsunami and the likely increase in shaking from the earthquake due to the closer proximity of the epicentre.

This scenario would potentially result in additional damage to housing, resulting in a larger number of displaced people requiring assistance.

Built environment

The coastal road network (including SH35 and SH2) and assets such as bridges would likely be damaged by the inundation resulting in further isolation of coastal communities. Landslides and liquefaction may be more

severe due to the increased shaking and leave parts of the region isolated.

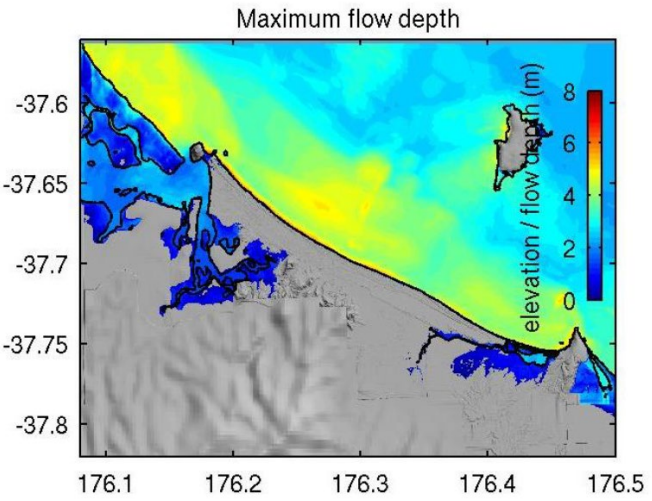


Figure 2.4: Modelled inundation flow depths for Tauranga in Scenario B (Power et al., 2018).

In addition, other lifeline assets within the tsunami zones, such as electricity, 3 waters and telecommunications, are likely to be severely impacted and will require significant amounts of time to re-instate beyond those stated for the credible planning scenario.

The Tauranga and Whakatāne airports would potentially become unusable due to the inundation. The Port of Tauranga would also be unusable due to debris and damage to port infrastructure as a result of the tsunami inundation. It is also likely that the rail network would be unusable for significant amount of time due to damage from both the shaking and the inundation.

This scenario may also result in some of the identified response facilities located in tsunami evacuation zones becoming unusable. This may include local EOC's, Police stations and Fire stations.

Scalability

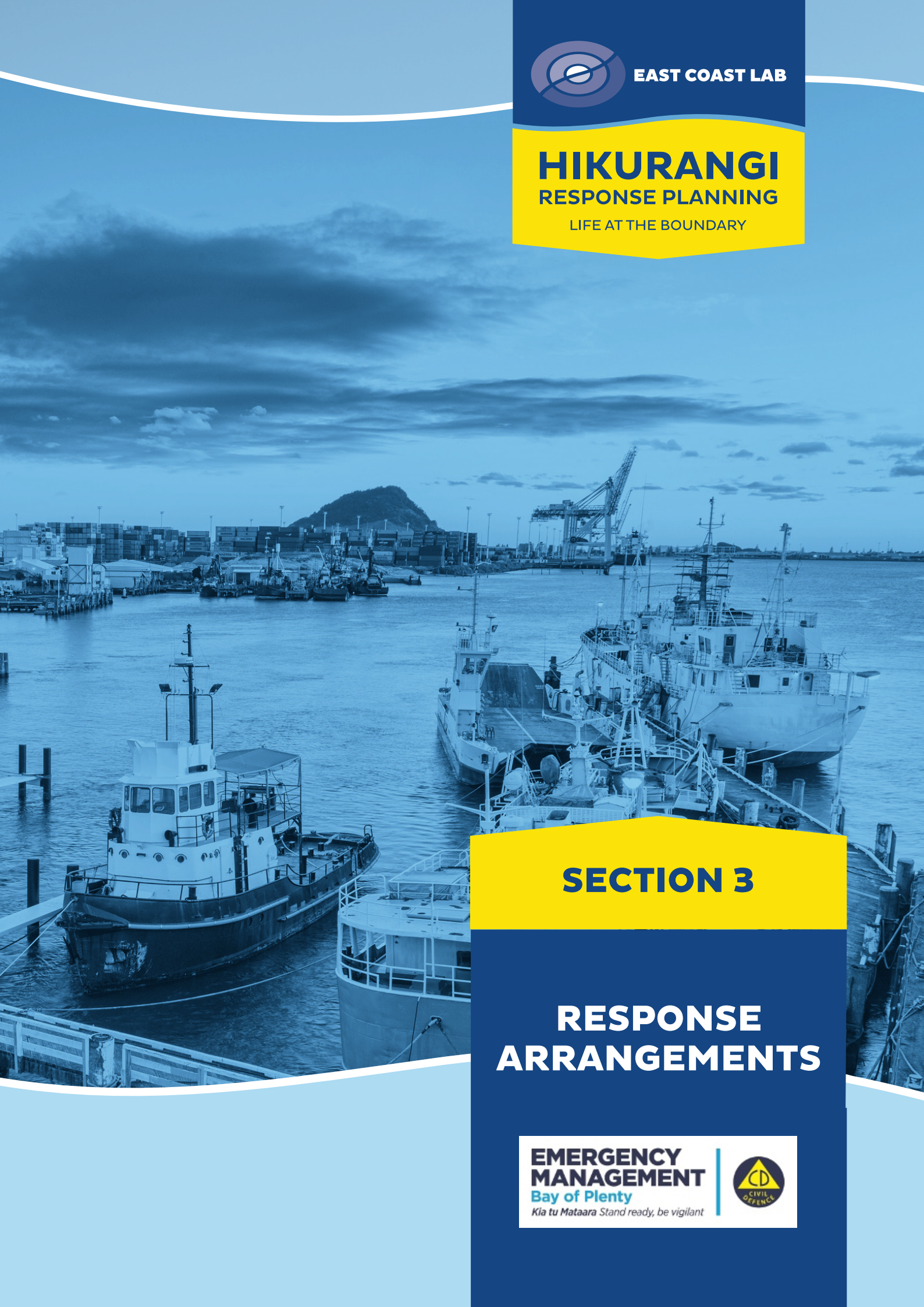
Please note that the response activities contained within this plan are designed to be scalable to a range of Hikurangi earthquake and tsunami scenarios for the Bay of Plenty CDEM Group, noting the planning scenario used is only one of many possible scenarios which could occur on the Hikurangi subduction zone.



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY



SECTION 3

RESPONSE ARRANGEMENTS

**EMERGENCY
MANAGEMENT**
Bay of Plenty

Kia tu Mataara Stand ready, be vigilant



3.0

Response arrangements

Initiation of response

The initiation of a response will be as a result of a long or strong earthquake occurring. Initially it will be unknown if the earthquake is associated with the Hikurangi subduction zone and therefore if a tsunami has been created.

Group Controller's Intent

To immediately initiate a coordinated, timely response to minimise loss of life and prevent escalation of suffering. Provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles.

This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

Limiting factors

The following factors may limit the Bay of Plenty CDEM Group's ability to implement the activities detailed within each of the response phases:

1. Liquefaction

A result of the earthquake will be widespread liquefaction. This will cause issues with access into and out of areas and may make some areas inaccessible for several days.

2. Landslides

A result of the earthquake will be widespread landslides across the region due to the steep nature of the land. This will cause some parts of the region to become completely inaccessible and will create issues with access into and out of the region. Some areas may potentially be inaccessible for several days.

3. Resource availability

The impacts of the earthquake and tsunami may make resources scarce until supply lines can be established from outside the region. Lack of resources (perceived or real) may result in panic buying or looting.

Response resources in the east of the region are limited and would require significant resources to be brought in from other areas to support response efforts. In particular, the health facilities are limited beyond Whakatane, as are emergency services and lifeline utility engineers.

4. Lifeline utility damage

Lifeline utilities will be extensively damaged as a result of the event adding complexity to the ability to carry out response activities and establish a coordinated response. Note also that many of the Lifeline agencies rely on the availability of contractors for response activities.

5. Continued risk of aftershocks

There will be a continued risk of large aftershocks occurring for many weeks and months after the initial event. These may cause further damage and result in the need for additional evacuations.

6. Number of displaced persons

This event will potentially result in hundreds of people becoming displaced. Quick reconnaissance of where people have been displaced to will be required to ensure aid reaches all those in need.

3.1

Roles and responsibilities

Organisation	Role and responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Ensure coordination of the response across local authority EOC's, partner agencies and responding organisations.
Local EOC's	<ul style="list-style-type: none"> • Ensure coordination of the response locally.
NZ Police	<ul style="list-style-type: none"> • Ensure public safety. • Maintain law and order. • Manage public movement. • Lead Disaster Victim Identification (DVI) process, mass casualty teams, reporting deaths to the Coroner's office and provision of inquiry services for missing persons. • Lead the investigation of any large-scale fatalities to report on criminal responsibility (Please note this would not be a priority within the first 24hours). • Where mass fatalities occur as a result of a scenario which severely impacts the Bay of Plenty Region, NZ Police would be responsible for the establishment and management of mass fatality temporary morgue facilities on behalf of the Coroner. These internal Mass Fatality Morgue plans are already in place were updated as a result of COVID-19. • Activate Business Continuity Plans.
Fire and Emergency New Zealand	<ul style="list-style-type: none"> • Lead response to all fire and hazardous substance related issues, urban search and rescue activities and coordinate the rapid impact assessment process. • Activate Business Continuity Plans.
Bay of Plenty DHB	<ul style="list-style-type: none"> • Ensure provision of hospital and key health services within the region. • Activate Business Continuity Plans.
St. John Ambulance	<ul style="list-style-type: none"> • Provide rapid response medical care as required and transportation of injured persons to health facilities. • Activate Business Continuity Plans.
Local Authorities	<ul style="list-style-type: none"> • Ensure staff are trained to support response both regionally and locally. • Ensure provision of core services including key lifeline utilities. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level.
Welfare Agencies	<ul style="list-style-type: none"> • Ensure the provision of welfare services to persons impacted by the event as required. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level.
Lifeline Agencies	<ul style="list-style-type: none"> • Ensure the provision of core lifeline services to the region to the maximum possible extent. • Activate Business Continuity Plans.
Iwi	<ul style="list-style-type: none"> • Provide cultural and communications advice regarding the response to Tangata Whenua within the region. • Coordinate links to Māori communities to provide key emergency information and status reports. • Activate Business Continuity Plans.

3.2

Coordination arrangements

In the early stages of any response there will be difficulty coordinating the activities of responding agencies until an appropriate command and control structure can be implemented.

Response structure

The Bay of Plenty CDEM Group will endeavour to establish the Bay of Plenty CDEM Group ECC response structure according to the Coordinated Incident Management System (CIMS).

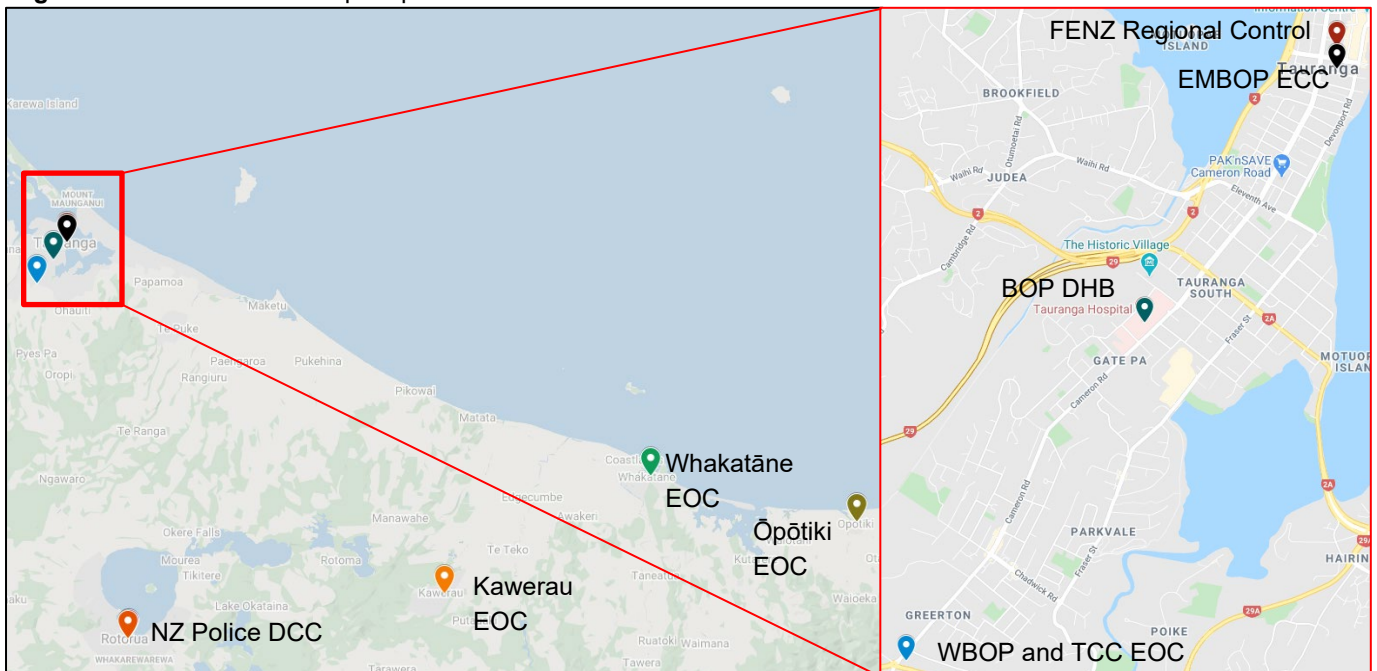
Establishing response facilities

It is highly likely that some key response facilities of core agencies will be heavily impacted by the event. The key response facilities that will be established as soon as practicable are shown in the table and figure below (Figure 3.0).

Establishment of these facilities will be dependent upon accessibility, structural safety and access to key equipment, resources, and lifeline services such as emergency power.

Response Facility	Location
Group Emergency Coordination Centre (GECC)	Bay of Plenty Regional Council
Tauranga City Council + Western Bay EOC	Western Bay of Plenty District Council
Rotorua EOC	Rotorua Lakes District Council
Whakatāne EOC	Whakatāne District Council
Ōpōtiki EOC	Ōpōtiki District Council
Kawerau EOC	Kawerau District Council
NZ Police DCC	Rotorua
Fire and Emergency NZ Regional Control Centre	Tauranga
Bay of Plenty DHB EOC	Tauranga Hospital
Civil Defence Centres	TBC

Figure 3.0: BOP CDEM Group response facilities



3.3

Response Phases

Three response phases have been used to describe the outcomes, actions and core response activities following a large Hikurangi event. The response phases cover:

- **Phase 1 (Immediate response)**

The immediate response, where emergency services are reacting to the earthquake and tsunami which has just occurred – this phase is dominated by activities which enable lifesaving and life preservation.

- **Phase 2 (Initiation of sustained response)**

The gap between the immediate, uncoordinated response and one that starts to become self-sustaining. During this phase, response agencies have interim operating capability.

- **Phase 3 (Sustained response)**

A self-sustaining response bolstered by domestic and/or international resources where required. All responding entities are at full operating capacity and capability

Event timeline

	Event	Outcomes/Actions	Core response activities
Phase 1	Earthquake occurs	<ul style="list-style-type: none"> • Mainshock causes severe damage across the Bay of Plenty region and wider East Coast of New Zealand. • Coastal populations begin self-evacuating inland and to higher ground in un-coordinated fashion. • Some evacuation routes are damaged, and people are unable to easily move to safety. • Emergency Services direct people to evacuate whilst moving key assets to safe locations and inland. • Electronic national and regional warnings issued for tsunami, however due to lifeline damage from the main shock, are not able to reach some of the Bay of Plenty population. 	<ul style="list-style-type: none"> • Alerts and notifications • Warning and informing (Public) • Self-evacuation and life safety activities • Response activation and mobilisation • Establishing communications.
	First tsunami reaches shore	<ul style="list-style-type: none"> • Landslides and liquefaction have occurred across the region. • First tsunami wave has reached the shore with strong currents experienced. • Population on coast are continuing to self-evacuate. 	
	Displaced population arriving in safe areas	<ul style="list-style-type: none"> • Community unsure of what to do. Spontaneous first aid and assistance provided by locals with resources at hand. • Emergency Services carry out initial actions plans, responding to immediate needs of those in safe areas and triaging medical assistance. • USAR and general rescue operations activities begin with in situ regional resources. • Evacuation of status 1 casualties begins. • Rapid impact assessments carried out in safe areas. • Response staff in affected areas check on their families. • Community-led response begins. 	

	Bay of Plenty CDEM Group activate response	<ul style="list-style-type: none"> • Key staff alerted and begin travelling to the GECC where able. • District and City councils establish EOC's to coordinate the local delivery of response activities. • Emergency Services activate response coordination facilities and provide liaison to the GECC. 	
	Basic communications established	<ul style="list-style-type: none"> • Basic VHF and satellite communications is established between key agencies. • Information gathering begins, however, there is limited situational awareness. 	
Phase 2	Delivery of rapid relief	<ul style="list-style-type: none"> • Community efforts to provide rapid relief to displaced and impacted persons bolstered. • Community halls, marae, schools and sports facilities opened to provide shelter and basic needs. 	<ul style="list-style-type: none"> • Providing Rapid Relief • Developing situational awareness • Managed evacuative and exclusion • Operational planning • Management of resources.
	Tsunami activity subsides, aftershocks on-going	<ul style="list-style-type: none"> • Ongoing aftershocks have the effect of pausing response activities, recommencing when risk of further tsunami assessed. 	
	Basic situational awareness gained	<ul style="list-style-type: none"> • CDEM Initial action plan developed. • Resources coordinated and deployed to priority areas. • Evacuation of other casualties as required begins, and as transport is available. • Identification of additional resource shortfalls and requests for support to NCMC begins. • Coordinated impact assessment begins. 	
	Surge support arrives	<ul style="list-style-type: none"> • Some international and domestic assistance starts to arrive but it is limited because of wide spread damage especially in the North Island (Note CDEM Group may need to provide accommodation for some of the external response personnel). • Preparation of Regional Assembly Areas begin. • USAR operations increase, with deployment of additional international teams into affected areas. 	
Phase 3	Welfare coordination established	<ul style="list-style-type: none"> • CDC's activated to meet basic needs of population. • Basic needs assessment process is conducted. 	<ul style="list-style-type: none"> • Coordinated welfare delivery • Restoration of essential lifeline services • Supporting community response and engagement • Debris and Environmental Management.
	Supply chains established	<ul style="list-style-type: none"> • Supply of essential goods into the region occurs via road network, Port of Tauranga and by air to Tauranga, Rotorua and Whakatane Airports. • Supermarkets and spontaneous 'hubs' (e.g. general stores with household items such as clothes) controlled by CDEM to ensure supplies are managed. 	
	Basic lifeline utilities re-established in inland areas	<ul style="list-style-type: none"> • Electricity is available to some parts of the region. • Basic mobile phone connections are re-established inland. • Water supply is restored to some areas. 	

	Community response supported	<ul style="list-style-type: none"> • Community initiatives supported with resources. 	
	Sustained response activities occurring	<ul style="list-style-type: none"> • On-going welfare needs of the population are met including food supply and medium-term accommodation for displaced persons. • Lifelines are continuing to be restored in impacted areas. • Communication is improving. • Supply chains are improving, and increased resources are arriving to support the response. • Environmental clean-up occurring. 	

3.4 Phase one- immediate response activities

Phase 1 response priorities

The following priorities exist for Phase 1 of the response in the Bay of Plenty:

- Conduct life safety activities
- Protect key resources needed for response
- Establish response coordination arrangements

Alerts and notifications

The natural warning signs (A long OR strong earthquake) will be the main alert to a major event occurring for all agencies. Given the nature of the event it may not be possible for the Bay of Plenty CDEM Group office to issue a regional warning, however, they should still endeavour to do this from a safe location, as it may still be received by some.

In addition to this alert it is assumed that a national warning will have been issued via the Emergency Mobile Alerting system and that this has been received where there is still capability in the communications networks (e.g. battery backup to cell phone towers).

As the event progresses alerts may need to be issued via other methods such as VHF and satellite communications.

Core objective:

To ensure that responding agencies within the region are alerted to issues relating to the event

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Ensure that regional warning system is utilised where possible to keep all responding agencies informed. • Implement alternate alerting methods where regional warning system is not able to be used.

All other agencies	<ul style="list-style-type: none"> • Ensure that alerts and notifications are disseminated to all key staff
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Warning and informing (Public)

Due to the nature of the event warning and informing the public may not be possible across many platforms.

In the early stages of the event (immediately after the initial earthquake has occurred) there would be a reliance upon the population acting based on the long or strong messaging that is used to promote natural warning signs.

There may be limited phone signal as a result of the quake, but it must be assumed that a national warning would be put out using the Emergency Mobile Alerting platform and where the capability was still operational this could be received by anyone with a mobile phone.

As the event progresses other platforms for communicating with the public, such as GeoNet which provides public access to earthquake and felt reports, may start to become available with the restoration of communications, however, during Phase 1 and 2 of the response communicating will be restricted.

The Bay of Plenty CDEM VHF network may still be operational following the quake and could be used in the first instance to communicate with impacted communities where radios exist. This will be reliant upon VHF radios in the communities being switched on and able to operate effectively.

Core objective:

To ensure the timely provision of key emergency information to people impacted by the event

Agency	Responsibility
Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Coordinate the provision of emergency information to the community across all available platforms.
All other agencies	<ul style="list-style-type: none"> • Ensure key emergency information is provided to the community in

	coordination with the Bay of Plenty CDEM Group and Local CDEM PIM Functions.
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Self-evacuation and life safety activities

It is assumed that there will be self-evacuation from coastal areas following the earthquake and this will be strongly encouraged in any warnings that are issued, as the epicentre of the quake will be unknown. However, it is likely that there will be severe congestion, and some may be unable to evacuate due to damage as a result of the earthquake, or their distance from a safe area. All efforts should be made by responding agencies to assist people to evacuate while ensuring that critical staff and resources are evacuated to safety to support the response.

The earthquake is likely to cause considerable damage within the region resulting in injuries. Initial focus for life safety activities should be directed towards those who have evacuated to a safe area or have been impacted by the event in areas away from the coast until an “all clear” message is received. Once it is safe to do so, and there is reduced risk to personnel and assets, the focus of life safety activities will move to those impacted by the earthquake near to the coast.

Core objective:

To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction

Agency	Responsibility
Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Provide clear direction with regards to safe zone locations and evacuation routes. • Ensure “All clear” message is disseminated as soon as received to enable emergency services to begin life-saving activities in coastal areas.
NZ Police	<ul style="list-style-type: none"> • Direct people to evacuate from areas at risk of inundation

	<ul style="list-style-type: none"> • Support traffic management where safe to do so.
Fire and Emergency New Zealand	<ul style="list-style-type: none"> • Coordinate USAR activities in impacted areas as the situation allows.
St. John Ambulance	<ul style="list-style-type: none"> • Provide medical assistance to those impacted by the event as the situation allows. • Support FENZ with USAR activities by providing medical assistance. • Transport injured persons to healthcare facilities.
Bay of Plenty District Health Board	<ul style="list-style-type: none"> • Ensure capability to meet the medical needs of the impacted population.

Response activation and mobilisation

In the initial phase of the event responding organisations will be utilising existing SOPs to respond accordingly. However, in order to ensure coordination across all agencies there will be a need to establish response facilities and mobilise personnel and resources to carry out key response activities.

The process of activation and mobilisation may be made extremely difficult by the lack of communications and accessibility of facilities. It is also highly likely that some staff and resources will have been lost due to their location at the onset of the event. In addition, damaged coordination facilities will require structural assessment by a suitably qualified building inspector before re-occupation.

Focus should be placed on ensuring the Group ECC is activated as soon as possible to provide a base for the coordination of the response. In addition, local EOC's should be established as soon as practicable to direct the response at the local level. The emergency services should focus on establishing response facilities to manage the on-going life safety activities.

Core objective:

To activate appropriate response facilities to enable coordination of the response at all levels

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the GECC Support key staff to access the GECC facility as required
Local EOC's	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the EOC Support key staff to access the EOC facility as required
Emergency Services	<ul style="list-style-type: none"> Activate response facilities, mobilise resources to respond and provide liaison to the GECC

Establishing communications

The ability to communicate between responding agencies and on the ground between responders is critical to enabling a coordinated and effective response to the impacts of the event.

It is highly likely that the standard form of communication normally used will either be severely compromised or completely inoperable (e.g. landline and mobile phone networks, internet) and therefore other methods will need to be utilised.

The core focus in the initial phase of the response should be on utilising the Bay of Plenty CDEM VHF network or satellite phones to establish communications between agencies. Individual agencies may still be able to use their own VHF network to communicate internally. In addition, the Bay of Plenty CDEM GECC should utilise the satellite communications equipment available to establish connections to the NCMC and support other response activities.

Core objective:

To establish appropriate communication to enable coordination of the response and information sharing between key agencies

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Ensure the operability of the Bay of Plenty CDEM Group VHF Network to support communication between responding agencies. Deploy satellite communications to enable communication with local EOC's, the NCMC and the Emergency Services
All other agencies	<ul style="list-style-type: none"> Ensure operability of VHF and satellite communications equipment to enable communication between the GECC and all responding agencies and internally with key response staff

3.5

Phase two- initiating sustained response activities

Phase two response priorities.

The following priorities exist for Phase 2 of the response in the Bay of Plenty:

- Ensure immediate needs of the population are met
- Gain situational awareness
- Prioritise and manage resources

Providing rapid relief

Providing rapid relief in the early stages of the event is critical to ensuring that people can get through the initial impacts. Rapid relief includes food, water, shelter, and urgent medical needs.

This event is likely to require rapid relief provision to many thousands of people. The provision of rapid relief is likely to be hampered by the dispersed population and the access to resources. In the initial phase of the response the rapid relief provided may be extremely basic and rely heavily upon the community to support the effort until more coordination can be established and appropriate resources deployed.

Core objective:

To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses, marae etc).
Local EOC's	<ul style="list-style-type: none"> Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event.
Welfare Providers	<ul style="list-style-type: none"> Ensure provision of rapid relief in support of the GECC and Local EOC's.

Developing situational awareness

Gaining a clear understanding of the event and ensuring that all responding agencies have a shared understanding of what has happened is vital to enabling clear and effective decision making. In the early phase of the response developing situational awareness will be made difficult due to the lack of communications, restriction on movement due to road damage, potential loss of personnel and ability to establish response facilities.

Initial situational awareness may come from responders attending facilities and their observations of the event and the impacts. As the response progresses and communications are established between responding agencies coordinated impact assessments may begin to occur. These may be rapid impact assessments (general

ground observations of the situation) in the first instance, but as time allows these will become more detailed and include street by street damage assessments, welfare assessments and lifeline asset damage assessments.

As the event progresses the situational awareness of all agencies should increase enabling more targeted response efforts in the worst impacted areas. For the development of situational awareness to be effective it is critical to establish clear communications between responding agencies as soon as possible to enable status reporting to the GECC and ensure that key information is disseminated to all agencies.

Core objective:

Develop a clear understanding of the impacts of the event as soon as possible to support decision making.

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies.
Local EOC's	<ul style="list-style-type: none"> Lead the welfare impact assessment process.
Fire and Emergency NZ	<ul style="list-style-type: none"> Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city.
NZ Police	<ul style="list-style-type: none"> Lead the rapid impact assessment process and coordinate the collection of information by other emergency services.
St. John Ambulance	<ul style="list-style-type: none"> Provide regular status reports to the Bay of Plenty CDEM GECC.
Bay of Plenty DHB	<ul style="list-style-type: none"> Support the rapid impact assessment process.
Local Authorities	<ul style="list-style-type: none"> Provide regular status reports to the Bay of Plenty CDEM GECC.

Welfare Agencies	<ul style="list-style-type: none"> • Support the rapid impact assessment process.
Lifeline Utilities	<ul style="list-style-type: none"> • Provide regular status reports to the Bay of Plenty CDEM GECC.

Managed evacuation and exclusion

As situational awareness increases and there is more ability to respond in impacted areas, evacuations and exclusions may need to be implemented to prevent further risk to the population. This may be as a result of additional risk from the impacts (e.g. landslide risk, health risks etc) or to enable response activities to occur without risk to people in the area.

Evacuation of an area will require a door-to-door approach to be taken, as it is most likely that communications will be extremely limited in the early phases of the response. In addition, the resources to conduct managed evacuations are likely to be extremely limited.

Exclusion from areas will be required to prevent people returning where there is an increased risk or to maintain security until residents are able to return. The establishing of cordons may not be possible in the early phases of the response until appropriate resources become available and may not be possible at all in some areas due to the logistical requirements.

Core objective:

To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so

Agency	Responsibility
Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police.
NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by the Bay of Plenty CDEM Group.

	<ul style="list-style-type: none"> • Establish cordons and exclusion zones
Local Authorities	<ul style="list-style-type: none"> • Support the establishing of cordons with appropriate resources

Operational planning

In the initial phase of the response most activities will occur based on existing SOPs and plans of each agency. While some of the activities will have a level of coordination on the ground, there is likely to be some duplication of effort and confusion in exactly what needs to happen and a higher level of planning required to enable coordination across the entire response.

Initial action plans for the event are likely to be very basic and lack detail due to the limited information and scale of the event (See Appendix 3, for a draft event action plan).

Operational planning can only begin to occur once clear communication has been established between agencies and there is a reasonable level of situational awareness regarding the impacts of the event and the issues that require response.

Core objective:

To ensure a coordinated response through a consolidated planning process across all responding agencies

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the Bay of Plenty CDEM Group Action Plan.
Local EOC's	<ul style="list-style-type: none"> • Coordinate the development of local action plans to ensure the delivery of the Bay of Plenty CDEM Group action plan.
All other agencies	<ul style="list-style-type: none"> • Contribute to the development of the action plan by identifying key tasks, issues and resource requirements.

Management of resources

Due to the extent of the impacts, resources to respond are likely to be severely impacted. Careful management of these will be required at an early stage to ensure that priority issues can be responded to effectively.

In order to manage resources effectively, the Bay of Plenty CDEM Group will first need to understand what resources have survived the event and are available to respond. It will be critical for all responding agencies to identify their available resources at an early stage and provide this information to the Bay of Plenty CDEM GECC so that resources can begin to be used in the most effective way. Any critical resources need to be identified and prioritised for use or requested from the NCMC if not available in the region.

There is also likely to have been significant damage to supply lines and retail outlets, such as supermarkets and fuel sources. Existing supplies within the region will need to be managed and prioritised to ensure these are used as effectively as possible until resources can be brought into the region.

Core objective:

To ensure the most effective use of all available resources in response activities.

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise available response resources. Identify any critical resource needs and request from the NCMC if not available within the region.
Local EOC's	<ul style="list-style-type: none"> Coordinate and prioritise the deployment of resources locally.
All other agencies	<ul style="list-style-type: none"> Identify all available and critical response resources and provide to the Bay of Plenty GECC.

3.6

Phase three- sustained response activities

Phase three response priorities

The following priorities exist for Phase 3 of the response in Bay of Plenty:

- Ensure on-going needs of the population are met
- Restore key lifeline services
- Support community response activities

Coordinated welfare delivery

The provision of welfare services to those impacted by the event will require coordination across multiple agencies and the community and will require significant resources to ensure people are able to manage through the event.

The region is likely to have displaced persons, including tourists, who cannot return to their homes or accommodation. Potentially there could be hundreds of people displaced long term as a result of the event, with many more only able to shelter in their homes and having limited access to utilities for a number of weeks. While some of these people may be able to stay with friends and family in areas not as heavily impacted, a large majority will be reliant upon help to find accommodation and meet their basic needs for an extended period of time. The supply of household goods and services will be a critical element of providing for the immediate and on-going needs of the population.

In addition, several areas of the Bay of Plenty are likely to be cut-off from support due to infrastructure damage and may have to provide for their own welfare for several days until supplies can be taken in. Settlements in the east of the region are likely to be separated from the rest of Bay of Plenty and critical supplies may need to be brought in by air in order to support the needs of the population there.

Core objective:

To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services.

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event including the provision of resources from neighbouring CDEM Groups where applicable. Ensure critical resources required to provide for on-going needs are prioritised.
Local EOC's	<ul style="list-style-type: none"> Ensure and coordinate the delivery of welfare services locally.
Welfare agencies	<ul style="list-style-type: none"> Support the provision of on-going needs as requested by the Bay of Plenty CDEM Group. Identify any critical resource needs to enable the delivery of key welfare services.

Restoration of essential lifeline services

Lifeline utilities are likely to have been very heavily impacted as a result of the event. The table below provides an overview of the estimated damage the planning scenario will cause – it is recommended regional response planning further quantifies and refines the likely damage to regional lifeline assets following a large Hikurangi event.

Energy

- Provided no extensive damage and National Grid availability, it could be expected that electricity would be restored to 80% of the Group within three days in this scenario. If the National Grid is damaged or there is extensive local damage this will take considerably longer.

- Potential gas leaks and breakages along the network would result in a reduction of capability.
- Please note: A key dependency for Mercury's Kawerau Geothermal station are regular process chemical deliveries from Tauranga/Mount Maunganui area.

Water

- It is anticipated all three waters would be unavailable within the first seven days and would require several months to fully restore.

Telecommunications

- Communications are likely to be impacted, particularly fibre connections. Mobile network on diesel generators may enable some communications short term and exchanges within towns would allow dialling locally. Communications is estimated to be restored within a week.

Transport

- Many state highways would suffer damage from landslides and liquefaction, isolating the region in some parts (in particular SH35 to East Cape).
- Several key bridges along SH routes would also be damaged and require repair to re-instate.

Port

- Tauranga Port would be unaffected by the tsunami but may have suffered damage from the earthquake. It is anticipated to be useable following the credible scenario after a structural assessment.

Airport

- All airports within the region (Tauranga, Rotorua, Whakatane) are anticipated to be useable following inspection provided they have not been severely damaged by the earthquake.

Lifeline restoration priorities

In tandem to the prioritised repair of logistics enablers listed below; power, potable water and storm water supply restoration in areas where people are still able to live will need to occur as soon as possible to reduce dependency on services such as water tankers and emergency power

generation. Emergency power resources should be prioritised for use by responding agencies.

In addition, fuel stations and regional fuel storage facilities may be severely impacted by the event due to loss of electricity or damage to key infrastructure. Without electricity, some fuel stations may require generator support to access fuel stocks. Fuel re-supply into the region will be unlikely in the initial phases of the response, therefore as a critical resource, distribution of fuel within the region may need to be managed to ensure there is enough available for emergency operations.

All lifeline restoration is dependent on the availability of contractors, resources and access to lifeline assets. As the following priorities are based on the credible planning scenario, please note they may need to be adjusted for the realised impacts of a future event.

1. Internal priority roads/access routes for emergency services:

In the early stages of the event, priority will need to be given to clearing access routes across the region to enable emergency response to occur and isolated populations access assistance.

2. Tauranga Airport

The Tauranga and Rotorua Regional Airports and Whakatāne Airport should be prioritised to enable the inwards movement of supplies and evacuation of critically injured persons.

3. Inter-regional road connections

Restoration of SH 2 (Tauranga – Whakatāne), SH5 (Taupo – Rotorua) SH29 (Tauranga – Hamilton) and SH35 (Ōpōtiki – Gisborne) should be prioritised to enable access to coastal communities and the flow of response resources between regions.

4. Tauranga Port

The Tauranga port is likely to suffer minor damage in the credible scenario. Operationalising the Port will enable the movement of resources between regions as part of the response.

Core objective:

Restore basic services to the community to the maximum possible extent.

Agency	Responsibility
Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise the restoration of lifeline services.
Local EOC's	<ul style="list-style-type: none"> Coordinate the restoration of basic services to the community where possible to do so.
Lifeline Utilities Agencies & Local Authorities	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so.

Supporting community response and engagement

The community will play an integral part in the response and will be vital in ensuring that the wider community is able to manage through the impacts of the response.

In the early phases of the response it is highly likely the community will provide for the immediate medical and welfare of those impacted by the event. While this may be sustainable in the short term, it will require support from the Bay of Plenty CDEM Group as supplies become limited, or more expertise is required.

Communities are also likely to lead the response efforts in their area in terms of debris clearance and this will need to be supported by the Bay of Plenty CDEM Group to ensure it occurs in a coordinated fashion and does not put anyone at risk.

Where possible, existing community groups should be utilised to provide information to the wider community and coordinate response efforts in their area.

Core objective:

Enable the community to lead the response effort where appropriate through the provision of resources and advice.

Agency	Responsibility
Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> Lead community engagement and provide supplies and resources to sustain community response efforts.
All other agencies	<ul style="list-style-type: none"> Support community response efforts through provision of information, advice and resources.

Debris and environmental management

The event will create a huge amount of debris, mainly from the earthquake. This is likely to require a large number of resources to clear and there will be a limited ability to separate any hazardous waste.

In the early phases of the response debris management may simply be piling up debris in place to clear access routes. Longer term, debris will need to be managed to ensure that hazardous substances and waste are cleared and stored where they pose no risk to human life. This may require the establishment of a specific facility to receive and sort waste and the development of additional landfill facilities within the region for disposal of the non-harmful waste. Hazardous and harmful waste will need to be transported to specific facilities outside the region but may need to be stored long term within the region before it can be disposed.

Core objective:

Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.

Agency	Responsibility
Local EOC's	<ul style="list-style-type: none"> Coordinate the collection, removal, and disposal of debris.

3.7

Inter-regional response requirements

Working with neighbouring regions

The event will impact most regions in New Zealand, given the scale of the quake and generated tsunami. As a result, support from neighbouring regions may need to be sought to assist parts of the Bay of Plenty region. This is most likely to be the case for the northern eastern part of the region, which will likely be cut-off from the remainder of the region, requiring the Waikato region to provide assistance.

It is most likely that Bay of Plenty may also be requested to support some areas of neighbouring regions, in particular the northern parts of the Tairāwhiti/Gisborne region, which is likely to be separated from the rest of the region.

Requesting support

Requesting support from a neighbouring region will require discussion between the National Controller and the two Regional Controllers. Memorandums of Understanding (MOU's) created in readiness may facilitate this occurring more quickly in response.

The requirements for inter-regional support are discussed in Volume II of the HRP Toolbox.

Priority inter-regional information requirements

The following diagram shows the BOP CDEM priority inter-regional information requirements to enable the emergency response. These include the status of neighbouring CDEM Groups, and key logistics nodes (e.g. Ports) and links (e.g. SH's) into the region and that link with the Tairāwhiti and Waikato CDEM Groups.

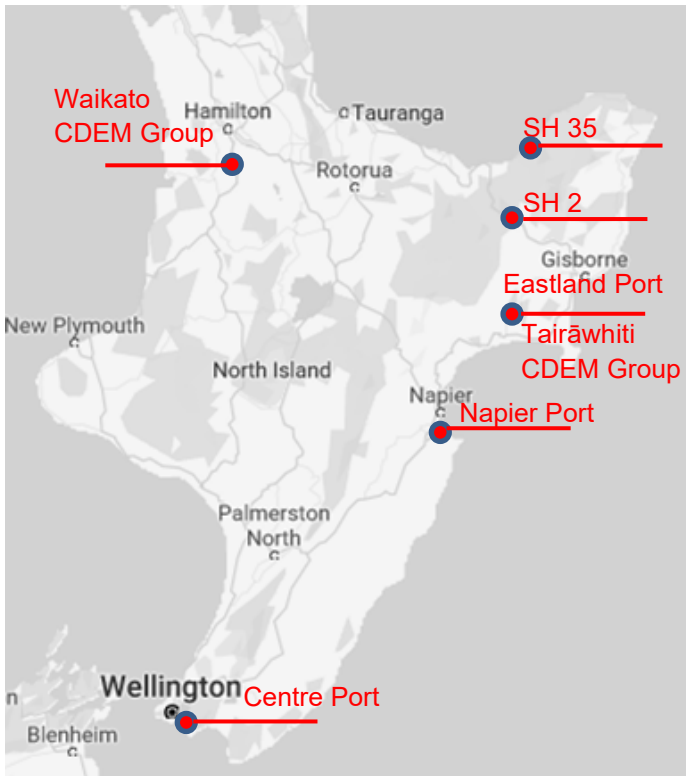


Figure 3.0: BOP CDEM Priority inter-regional information requirements



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 4

LOGISTICS & LIFELINES

**EMERGENCY
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4.0 Logistical requirements

A number of logistical requirements exist that will enable the region to effectively respond to the impacts of the event.

As part of regional response planning it is recommended logistical requirements for the response to a large Hikurangi event are further scoped and refined.

Priority sites, emergency power supply and emergency water supply

As part of the regional response planning process it is recommended the following logistical requirements are scoped:

- **Priority sites:** Identify sites which are a priority to re-establish basic lifeline services to, to enable them to function as soon as possible following an emergency. Stakeholders suggest priority sites include:
 - ECC and EOC Locations
 - Key power generation sites including:
 - Kawerau Geothermal Plant (Mercury)
 - Matahina and Aniwhenua Hydro stations (Trustpower)
 - Small generating plants in the Kawerau area
- **Emergency generators:** Identify the owner and locations of emergency generators in the region to enable emergency power supply.
- **Emergency water supply:** Identify companies which may be able to assist with the provision of emergency water supplies.

Key supply routes

The following state highways should be prioritised and re-established as soon as practicable to enable re-supply into parts of the region and from the north to the south of the country:

- State Highway 2 (Waihi - Tauranga – Whakatāne – Ōpōtiki)
- State Highway 5 (Taupo – Rotorua)
- State Highway 29 (Tauranga – Hamilton)
- State Highway 35 (Ōpōtiki – East Cape)

The Tauranga and Rotorua Regional Airports and Whakatāne Airport should be prioritised for restoration to enable the inward supply of resources to the region.

These will most likely also be utilised as hubs to provide resources into neighbouring regions. The Port of Tauranga should also be prioritised as this will provide a significant national hub for resources entering New Zealand.

Communications

The following sites should be prioritised for repair to enable communications within the region:

- Team Talk/Vital Trunk Mobile Radio Communications sites (important for electricity generation and for transportation operators)

Fuel supply

It is likely that following the credible planning scenario and a damage assessment, most fuel stations in the region will be able to operate. Available fuel stations may require generator support where power to the station has been lost. As a critical resource, access to fuel may need to be controlled by the CDEM Group to safeguard supplies for the emergency response.

Supermarkets

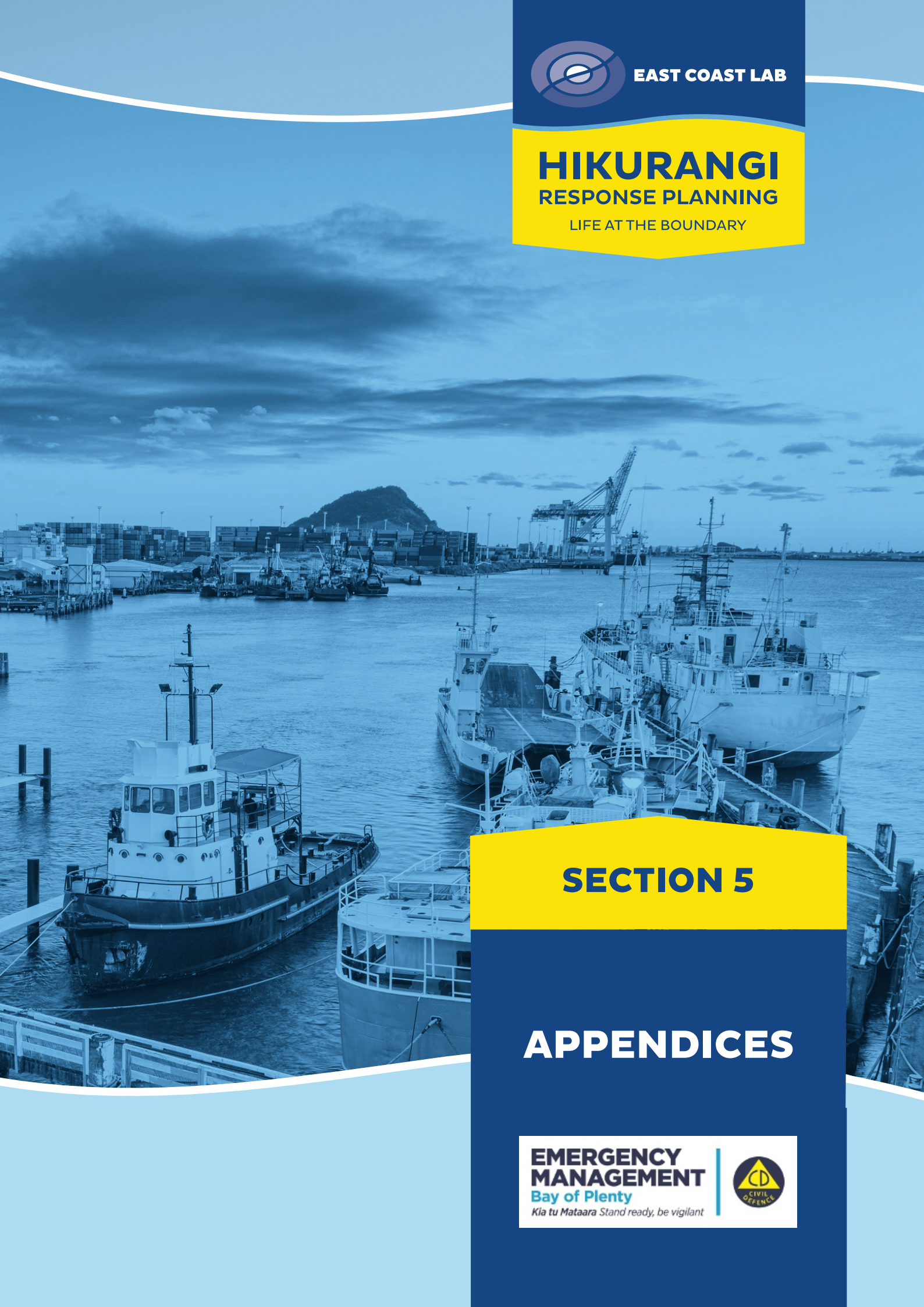
It is likely that following the credible planning scenario and a structural assessment, most supermarkets in the region will be able to operate. Where power has been lost, some supermarkets may require generator support for refrigeration of goods. As a critical resource, access to food and household goods may need to be managed by the CDEM Group if panic buying and/or looting occurs following the event.



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LIFE AT THE BOUNDARY



SECTION 5

APPENDICES

**EMERGENCY
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Appendix 1: Response assumptions

Following a large Hikurangi event, it is assumed:

- **The process of declaring local states of emergency will be initiated immediately.**

A large Hikurangi event will have significant impacts on all five CDEM Groups. It is assumed local authorities and CDEM Groups affected will immediately initiate the process of declaring states of local emergency.

- **A state of national emergency is likely to be declared within 24hrs following the initial earthquake.**

A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact. Ultimately, this is the decision of the Minister of Civil Defence, on advice of the National Controller and/or Director of Civil Defence Emergency Management.

Following declaration, the National Crisis Management Centre (NCMC) will direct the overall response. The NCMC will be situated in Wellington or at its secondary location in Auckland.

- **CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.**

A large Hikurangi event will significantly impact the five CDEM Groups. This will lead to a reduced level of operations immediately following the initial earthquake and subsequent tsunami impacts. It is not expected that the five CDEM Groups will be able to immediately activate and lead a coordinated response.

Each of the five CDEM Groups on the North Island East Coast have primary and secondary or mobile Emergency Coordination Centres (ECCs). Most Emergency Operations Centres (EOCs) have primary and secondary locations in each of the five Groups. The community, local, regional and multi-agency response will be led and coordinated from these centres including communication and coordination with other CDEM Groups and the NCMC.

- **The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.**

The NCMC will be functional but will initially be operating at reduced level. The NCMC will be able to coordinate the national response in Wellington or from its alternative site in Auckland.

- **Initial tsunami threat maps are estimated to be produced by the National Geohazards Monitoring Centre (NGMC) within 20-30 minutes**

Following a large Hikurangi event it is estimated it could take approximately 20-30 minutes for the National Geohazards Monitoring Centre (NGMC) to make an initial assessment and relay initial threat maps to the NEMA duty team using alternate communications, e.g. satellite phone and BGAN, if necessary. The NEMA Duty Team would then pass this information onto CDEM Groups to inform decision making.

- **Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.**

A large Hikurangi event will impact Groups wider than those scoped by this framework. This framework does not assume the five CDEM Groups will receive any assistance from near or neighbouring CDEM Groups as it is likely they will be dealing with their own impacts. Depending on their capacity, CDEM Groups in lower South Island and upper North Island (e.g. Northland CDEM) may be available to assist those most affected. Offers and requests for inter-Group assistance will be coordinated by the NCMC.

- **Local Government within the North and South Island will continue to operate but with reduced capacity and capability**

North and South Island authorities (local and territorial councils), will continue to operate but with reduced capacity and capability. Local government authorities, with regulatory oversight responsibility, will continue their same roles and responsibilities during the response, most likely at an initial reduced capacity.

- **Responding agencies will be functional but operating with reduced capacity and capability**

Responding local, regional and national agencies (such as emergency services, health services and welfare services) will self-activate within affected areas where those agencies have a presence. Like local authorities, national and regional responding agencies will initially be operating at reduced capacity.

- **Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.**

Triggered by a large Hikurangi earthquake, secondary hazards such as tsunamis, aftershocks, land subsidence and uplift/lateral spreading, liquefaction, landslides, rockfall, fire, flooding, dam collapse, building collapse, fire and seiching of large water bodies will pose an additional risk to life and will significantly impair the response and recovery processes.

- **Standard communications will be limited, where available, alternate communications will be used**

A large Hikurangi event will affect standard communications (including phones and internet) (See Section 3.1.5 for further detail). Responding Groups will need to rely on alternate methods to communicate. In some cases, alternate communication methods may be also be impacted by the event (e.g. loss of radio systems due to tower collapse or loss of power to a tower). Communication may be hampered by the incompatibility of systems used by CDEM Groups and responding agencies.

- **Lifeline utilities will be limited or unavailable in the five CDEM Groups.**

Lifeline utilities, including the three waters, power and telecommunications, will be limited or unavailable in the five CDEM Groups for at least 7 days following the initial earthquake and tsunami impacts. Secondary hazards, such as landslides and aftershocks will impact the ability to restore these networks.

- **Movement corridors will be affected, and many roads will be unusable**

Landslides, lateral spreading and liquefaction will lead to many roads becoming unpassable, isolating some communities and CDEM Groups. This will significantly impact the supply chain and the mobility of responding agencies within and between regions.

- **Rail will be inoperable within the five CDEM Groups**

Rail networks in and between the five CDEM Groups, including the Wellington Regional network, Main Trunk Line and the Palmerston North - Gisborne Line (PNGL), will be unusable during response.

- **Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.**

All airports within the five CDEM Groups will experience severe shaking and will require assessment before being able to be declared operational. Even opened most will have operational restrictions due to the wider impacts, such as loss of power and standard communications.

It is assumed that Hawke's Bay airport will be permanently non-operational due to forecasted subsidence reclaiming the land to sea. Wellington airport is likely to be impacted by tsunami debris and not expected to be available until E +3 days. Gisborne and Palmerston North Airport are anticipated to be operational following assessment.

Additional assessments will be required following any substantial aftershock or tsunami.

- **Ports will be impacted by the earthquake and tsunami.**

Tauranga, Gisborne, Napier and Wellington Ports will be affected by earthquake and tsunami. Tsunami debris will likely damage critical assets such as piers and wharves, limiting their use until repaired. Liquefaction may also compromise foundations, destabilising port infrastructure. Assessments and harbour surveys will be required before the ports can be opened.

Additional assessments will be required following any substantial tsunami.

- **Health and welfare services will be overwhelmed.**

The large number of injuries and fatalities expected will overwhelm health services within the five CDEM Groups (See Appendix A.2: 'SitRep') Welfare services will be overwhelmed, especially due to the persons displaced, and possibly separated, during the immediate mass evacuation.

There will be significant international concern over family and friends who are unable to be contacted in the immediate aftermath of the response.

- **Communities will be isolated.**

Many communities will become isolated due to transport infrastructure damage or physical barriers, e.g. lateral spreading, wash outs, tsunami debris, liquefaction and/ or landslides. Depending on the scale of damage, it may take days to weeks to reach some isolated communities

- **Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.**

Many members of the public will self-evacuate (as encouraged through the 'long or strong, get gone' messaging) inland or to higher ground following the earthquake shaking.

A large proportion of those who self-evacuate will require assistance after reaching higher ground, inland areas or buildings if vertical evacuation has taken place. They may only have the items they evacuated with and will therefore have immediate needs - delays meeting these needs are likely to worsen health outcomes.

- **Depending on the time of day significant numbers will be displaced from their home locations.**

A large Hikurangi event could occur at any time. A daytime event in the working week will result in many people unable to return home in the initial response phase. These displaced people will need their immediate needs met. These displaced people will want to return to their families and home as soon as possible.

- **The community-led and tangata whenua response will work to meet communities immediate and basic needs where possible.**

Spontaneous community volunteer groups are to be expected to activate, and marae manaaki (hosting) is very likely where buildings are safe. Iwi/Taiwhenua and Haurora Providers will very likely activate their own response to the crisis.

Community halls, facilities and homes may also be opened to vulnerable people. It is likely the spontaneous community-led and tangata whenua response forms to address the immediate needs of the community before official assistance from responding agencies can arrive.

- **Ordered mass-evacuation will not automatically occur.**

There will not be an automatic ordered evacuation of a large part of the general population from affected areas (excluding Emergency Mobile Alerts encouraging the public to evacuate tsunami evacuation zones). Any ordered evacuation that does occur will be covered by the National Action Plan and will be planned for and facilitated in partnership with affected CDEM Groups.

Note: Ordered mass-evacuation is independent of immediate self-evacuation for life safety (e.g. responding to a long or strong earthquake) which may be informed by Emergency Mobile Alerts (where power and telecommunication networks allow).

- **There will be significant and long-term environmental impacts.**

Fuel, chemicals and hazardous materials (e.g. human waste, milk waste) may be leaked during the earthquake and/or tsunami, leading to environmental damage but also health and safety risks for responding agencies.

A large amount of debris, e.g. building facades, harmful materials-asbestos, soil and rock, will be generated by this event, altering and in some cases harming the environment. This debris may block transport routes reduce the mobility of responding agencies.

- **National and regional assembly areas will be established in accordance with national and regional plans.**

The NCMC will direct Regional Assembly and Staging Areas (Air and Sea) to be established to enable the storage, organisation and mobilisation of resources required by the response. The locations to be used will be assessed for damage following initial and follow-on impacts

- **Offers of international assistance will be made and coordinated through the NCMC.**

Offers of or requests for international assistance will result from this event. These will be managed by MCDEM and considered by the National Security Committee of Cabinet (NSC), via the Officials Committee for Domestic and External Security Coordination (ODESC) system

Appendix 2 – Core objectives and agency responsibilities

Activity	Core objective	Agency responsibilities	
Phase one – Immediate response activities			
Alerts and notifications	<i>To ensure responding agencies within the region are alerted to issues relating to the event</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Ensure that regional warning system is utilised where possible to keep all responding agencies informed. • Implement alternate alerting methods where regional warning system is not able to be used.
		All other Agencies	<ul style="list-style-type: none"> • Ensure that alerts and notifications are disseminated to all key staff.
Warning and Informing the public	<i>To ensure timely provision of key emergency information to people impacted by the event</i>	Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Coordinate the provision of emergency information to the community across all available platforms.
		All other agencies	<ul style="list-style-type: none"> • Ensure key emergency information is provided to the community in coordination with the Bay of Plenty CDEM Group and Local CDEM PIM Functions.
Self-evacuation and Life Safety	<i>To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction</i>	Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Provide clear direction with regards to safe zone locations and evacuation routes. • Ensure “All clear” message is disseminated as soon as received to enable emergency services to begin life-saving activities in coastal areas.
		NZ Police	<ul style="list-style-type: none"> • Direct people to evacuate from areas at risk of inundation. • Support traffic management where safe to do so.
		Fire and Emergency NZ	<ul style="list-style-type: none"> • Coordinate USAR activities in impacted areas as the situation allows.
		St John Ambulance	<ul style="list-style-type: none"> • Provide medical assistance to those impacted by the event as the situation allows. • Support FENZ with USAR activities by providing medical assistance. • Transport injured persons to healthcare facilities.
		Bay of Plenty DHB	<ul style="list-style-type: none"> • Ensure capability to meet the medical needs of the impacted population.
Response Activation and Mobilisation	<i>To activate appropriate response facilities to enable coordination of the response at all levels</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Utilise all systems available to mobilise response staff and activate the GECC. • Support key staff to access the GECC facility as required.
		Local EOC's	<ul style="list-style-type: none"> • Utilise all systems available to mobilise response staff and activate the EOC.

			<ul style="list-style-type: none"> Support key staff to access the EOC facility as required.
		Emergency Services	<ul style="list-style-type: none"> Activate response facilities, mobilise resources to respond and provide liaison to the GECC.
Establishing communications	<i>To establish appropriate communication to enable coordination of the response and information sharing between key agencies</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Ensure the operability of the Bay of Plenty CDEM Group VHF Network to support communication between responding agencies. Deploy satellite communications to enable communication with the NCMC and the Emergency Services .
		All other agencies	<ul style="list-style-type: none"> Ensure operability of VHF equipment to enable communication between the GECC and all responding agencies and internally with key response staff.

Activity	Core objective	Agency responsibilities	
Phase two – initiating sustained response activities			
Providing Rapid Relief	<i>To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses).
		Local EOC's	<ul style="list-style-type: none"> Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event.
		Welfare Providers	<ul style="list-style-type: none"> Ensure provision of rapid relief services in support of the GECC.
Developing Situational Awareness	<i>Develop a clear understanding of the impacts of the event as soon as possible to support decision making</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies. Lead the welfare impact assessment process. Conduct building damage assessments. Conduct utility damage assessments.
		Local EOC's	<ul style="list-style-type: none"> Lead the welfare impact assessment process. Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city.
		Fire and Emergency NZ	<ul style="list-style-type: none"> Lead the rapid impact assessment process and coordinate the collection of information by other emergency services. Provide regular status reports to the Bay of Plenty CDEM GECC.
		NZ Police	<ul style="list-style-type: none"> Support the rapid impact assessment process. Provide regular status reports to the Bay of Plenty CDEM GECC.

		St. John Ambulance	<ul style="list-style-type: none"> • Support the rapid impact assessment process. • Provide regular status reports to the Bay of Plenty CDEM GECC.
		Bay of Plenty DHB	<ul style="list-style-type: none"> • Support the rapid impact assessment process. • Provide regular status reports to the Bay of Plenty CDEM GECC.
		Welfare agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process. • Provide regular status reports to the Bay of Plenty CDEM GECC.
		Lifeline Utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments. • Provide regular status reports to the Bay of Plenty CDEM GECC.
Managed evacuation and exclusion	<i>To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so</i>	Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police.
		NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by Bay of Plenty CDEM Group. • Establish cordons and exclusion zones.
		Local Authorities	<ul style="list-style-type: none"> • Support the establishing of cordons with appropriate resources.
Operational Planning	<i>To ensure a coordinated response through a consolidate planning process across all responding agencies</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the Bay of Plenty CDEM Group Action Plan.
		Local EOC's	<ul style="list-style-type: none"> • Coordinate the development of local action plans to ensure the delivery of the Bay of Plenty CDEM Group action plan.
		All other agencies	<ul style="list-style-type: none"> • Contribute to the development of regional and local action plans by identifying key tasks, issues and resource requirements.
Management of resources	<i>To ensure the most effective use of all available resources in response activities</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise available response resources. • Identify any critical resource needs and request from the NCMC if not available within the region.
		Local EOC's	<ul style="list-style-type: none"> • Coordinate and prioritise the deployment of resources locally.
		All other agencies	<ul style="list-style-type: none"> • Identify all available and critical response resources and provide to the Bay of Plenty GECC.

Activity	Core objective	Agency responsibilities	
Phase three – sustained response activities			
Coordinated welfare delivery	<i>To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event. • Ensure critical resources required to provide for on-going needs are prioritised Ensure critical resources required to provide for on-going needs are prioritised.
		Local EOC's	<ul style="list-style-type: none"> • Ensure and coordinate the delivery of welfare services locally.
		Welfare agencies	<ul style="list-style-type: none"> • Support the provision of on-going needs as requested by the Bay of Plenty CDEM Group. • Identify any critical resource needs to enable the delivery of key welfare services.
Restoration of essential lifeline services	<i>Restore basic services to the community to the maximum possible extent</i>	Bay of Plenty CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise the restoration of lifeline services.
		Local EOC's	<ul style="list-style-type: none"> • Coordinate the restoration of basic services to the community where possible to do so.
		Lifeline Utilities Agencies & Local Authorities	<ul style="list-style-type: none"> • Undertake the restoration of basic services to the community where possible to do so.
Supporting community response and engagement	<i>Enable the community to lead response where appropriate through the provision of resources and advice</i>	Bay of Plenty CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Lead community engagement and provide supplies and resources to sustain community response efforts.
		All other agencies	<ul style="list-style-type: none"> • Support community response efforts through provision of information, advice and resources.
Debris management	<i>Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.</i>	Local EOC's & Local Authorities	<ul style="list-style-type: none"> • Coordinate the collection, removal and disposal of debris.

Appendix 3 – Hikurangi earthquake and tsunami draft event action plan

Event name:	AP Number:
Hikurangi Subduction earthquake and Tsunami	1
Operational period from:	Coordination facility:
	Bay of Plenty Group Emergency Coordination Centre
Operational period to:	Controller:

Summary of Incident / Event: (A summary of the hazard impacts, environment and response actions to date, including the most dangerous and most likely hazard scenarios. This is based on reconnaissance and status reports.)

- Mw 8.9 earthquake occurred on the Hikurangi subduction zone at **enter time and date here**. The earthquake was centred on the **central** portion of the Hikurangi subduction zone.
- A large tsunami was generated by the earthquake along the East coast of New Zealand. Impacts in the Bay of Plenty have been minimal from the tsunami, with only strong currents and a small waves observed. The first wave arrived at **Enter place and time of arrival here**; Strong currents will continue for up to 24 hours. Large numbers of people self-evacuated inland and to higher ground. An 'all clear' to return into the tsunami evacuation zone has been issued to enable emergency operations to be conducted.
- Impacts are not limited to Bay of Plenty, with damaging shaking experienced, and associated tsunami impacts across the North Island and top of South Island limiting the capacity of other CDEM Groups to support response in the worst hit areas.
- Ongoing aftershocks continue to limit the ability of emergency services to assist the trapped and injured within impacted areas.
- There is a large amount of isolation due to physical barriers and unavailable comms. This isolation applies to communities, resources and emergency services.
- The impact to engineering lifelines and transport nodes/links has been major. There is limited communication, electricity and potable water.
- Many persons are displaced overwhelming the capacity of welfare systems to cope. These people have urgent and unmet needs such as food, water, shelter and clothing.
- The DHB's are overwhelmed with the amount of injuries presenting at primary and secondary health centres. Medical supplies are limited, and generators will be required to continue operating.
- This event is unprecedented, provision of life safety advice and reassurance is paramount to maintaining public order and saving lives as secondary hazards continue.

Mission: (Mission Statement.)

To ensure a coordinated and timely response to minimise loss of life and prevent escalation of suffering.

Intent: (Give the intent, best stated as a concept, key tasks and end-state. It is a broad statement of what must happen and when.)

To provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put

into any situations that present additional danger beyond accepted levels to conduct their roles. This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- The public are protected from entering dangerous areas
- People's basic and immediate needs are met as quickly as possible
- People can access adequate medical assistance
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

The key priorities for the response are:

- Conduct life safety activities
- Identify and source key resources needed for response
- Establish response coordination arrangements
- Ensure immediate needs of the population are met
- Provide the public with appropriate response information
- Gain situational awareness
- Prioritise and manage resources

Designated Tasks: (Specific tasks and timings for each agency under the plan.)

Bay of Plenty CDEM GECC

- Ensure that responding agencies are kept alerted and informed with regards to the event and its impacts.
- Coordinate the provision of emergency information to the community to reassure and support response activities.
- Establish the GECC and communications to support the sharing of information between responding agencies.
- Coordinate the provision of rapid relief across the region.
- Coordinate the collection and analysis of information to inform situational awareness across all responding agencies.
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons.
- Coordinate the Group-wide response planning process.
- Coordinate and manage the acquisition and prioritisation of response resources and emergency welfare resources.

Local Authorities / EOC's

- Coordinate the provision of emergency information to the community to reassure and support response activities.
- Establish communications to support the sharing of information between responding agencies.
- Support the displaced population through the coordination of rapid relief and emergency shelter.
- Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city Coordinate the collection of welfare needs information.
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons.
- Coordinate the local response planning process.

- Coordinate and manage the delivery of local response resources and emergency welfare resources.
- Conduct lifeline utility damage assessments and establish temporary arrangements for water distribution.
- Clear key routes within district to enable response activities to occur.
- Respond to public health issues as situation allows.

New Zealand Police

- Carry out evacuations of identified areas as requested by the Bay of Plenty CDEM GECC.
- Establish and maintain access control measures into evacuated areas.
- Maintain law and order.
- Support rapid impact assessment process.
- Support Fire and Emergencies New Zealand USAR activities.
- Establish Inquiry and Disaster Victim Identification (DVI) process.

Fire and Emergencies New Zealand

- Coordinate USAR activities in impacted areas as situation allows.
- Establish rapid impact assessment process where safe to do so.

St. John Ambulance and Bay of Plenty DHB

- Attend to urgent medical needs as situation allows.
- Support Fire and Emergencies New Zealand USAR activities.
- Activate all operable medical facilities to support management of casualties.
- Establish temporary morgue facilities.
- Support on-going medical needs of population.

Welfare Agencies

- Support the provision of rapid relief to the impacted population.
- Support the rapid impact assessment process and the collection of welfare and community impact information.

Te Puni Kōkiri (national and regional offices)

- To work with other government agencies and CDEM Groups to facilitate and co-ordinate support to Māori who require assistance, and to engage with iwi, hapū, whānau, and Māori communities to ensure their needs are met.
- To coordinate links with Iwi organisations to Māori communities to provide key emergency information and status reports

Lifeline Utilities Agencies

- Ensure key routes are cleared and alternate routes established where access is no longer possible to support response activities
- Ensure re-establishment of Tauranga, Rotorua and Whakatane Airports to support deployment of resources.
- Establish access to emergency power supplies and re-establish electricity network where possible to do so.

- Establish temporary access to communications.

Limiting Factors: (Matters that may or will limit options, timeframes, or outcomes.)

Matters that may or will limit options, timeframes and/or outcomes:

- Emergency services and USAR resources are limited.
- Food and potable water supplies are limited within the Group.
- Damage to the medical supply chain combined with a stretched health service (low staff numbers and high community demand) is leading to worsening health outcomes.
- Damage to power and telecommunication infrastructure is limiting the effectiveness of multi-agency coordination.
- Damage to transport infrastructure, e.g. from liquefaction or lateral spreading, is limiting the mobility of responding agencies around the region.
- Significant numbers of displaced people.
- The ability to sustain the immediate and basic needs of affected populations.
- Availability and ability of critical personnel to get to key areas e.g. engineers to certify use of assets & key medical staff to get to key medical facilities.

Coordination Measures: (Times, locations, boundaries, and other measures designed to coordinate the response.)

- The Group Emergency Coordination Centre is established at [REDACTED] and is operating 24/7
- Local EOC's are established [REDACTED]
- ESCC meetings are occurring via satellite phone at [REDACTED] daily
- GECC IMT meetings are at [REDACTED]
- Group Sitreps are released at [REDACTED] y
- Status Reports are required from all agencies [REDACTED]

Resource Needs: (Who will provide what and when they will do it – including: information, supply, personnel, equipment and transport.)

The Bay of Plenty CDEM Group requires assistance as soon as possible in the form of:

- Food, water, medical supplies
- Fuel and generators
- NZDF and International Defence Forces support for logistics and operations (ships, helicopters, terminal operations teams, fuel delivery systems, water purification etc.)
- CDEM staff for GECC and local EOC's
- Surge support from the emergency services (incl. USAR and DVI specialists)
- Surge support from other responding agencies and organisations
- Medical staff and facilities
- Building and transport infrastructure assessors including technical experts for the detailed inspection of
- buildings and structures
- Assets to enable reconnaissance

Information Flow: (Who needs to know and who has information we need? May include key information requirements, or they may be attached.)

Information inputs:

- Warnings and alerts from NEMA / GNS
- Local Sitreps and action plans
- Situational awareness information gathered from rapid impact assessments, community and status reports
- NCMC Action Plan and situation reports
- Resource requests

All status reports to be sent to: [REDACTED]

Information outputs:

- Public information and alerts / warnings to responding agencies and public
- Situation reports
- Action Plan
- Resource requests to NCMC

Public Information Plan: (Outline of intended public information processes and outputs. This may be attached.)

Establish a regular schedule for the provision of warnings, life safety advice, information regarding the situation and reassurance regarding the response. Public communications will use consistent messaging guides where possible.

If standard telecommunications are not working, alternate means of communicating will need to be utilised.

Communications Plan: (Frequencies / purpose / coverage, role cell phone numbers communications schedule, etc..)

The Group ECC will utilise the [REDACTED] **VHF Channels** to conduct communications with responding agencies

Where possible, this will be supplemented by satellite communications as available. The Group satellite phone numbers are as follows:

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[Redacted content]

Appendix 4: Supporting diagrams

The following diagrams are based on the credible planning scenario and support the response concepts included this paper and in Volume II of the Hikurangi Response Planning toolbox. Please note the following diagrams are ‘examples’ only and are based on the credible planning scenario. They do not reflect planned response arrangements between the five CDEM Groups (Bay of Plenty, Tairāwhiti, Hawke’s Bay, Manawatū-Whanganui and Wellington) and estimated lifeline impacts require further refinement as part of regional response planning.

Figure 1: Inter-regional support (overleaf)

Following a large Hikurangi event it is likely some CDEM Groups may not have the capacity or capability to coordinate the response in one or more of their communities, requiring another CDEM Group with the capability and capacity to help by coordinating beyond its boundaries, for example, where a physical barrier, such as a landslide, may be isolating a community. Coordination across boundaries may also be necessary to achieve an effect, e.g. reconnaissance of an asset.

The decision for a CDEM Group to coordinate the response in a community beyond its boundaries would be a joint decision between the two CDEM Groups involved and would be in consultation with the National Controller and appropriate stakeholders.

Additionally, it is important to note some agency boundaries, such as NZ Police and Fire and Emergency NZ (FENZ) regions, do not align to regional council boundaries. Engagement and response planning with these agencies therefore requires a coordinated approach between the CDEM Groups and the agencies involved.

The requirement for national CDEM support and coordination should be identified and planned for where regions do not have the capability or capacity to meet response requirements themselves, or with direct coordination with adjacent regions.

Figure 2: Response Islands (overleaf)

This figure demonstrates the ‘response island’ concept at a regional scale, adapted from the Wellington Region Earthquake Plan (WREP). Please refer to the WREP for further information about response islands specifically in a Wellington context.

Following the credible scenario, landslides and/or damage to roading infrastructure is anticipated to isolate Tairāwhiti, Hawke’s Bay and Wellington regions, effectively creating ‘response islands’.

Until inter-regional road connections are restored, these regions will need to use alternate means (e.g. ships/planes) to fly people and resources into and out of the region.

Figure 3: Lifeline impacts – utilities (overleaf)

The figure below shows the estimated availability of lifeline utilities within the first seven days following the credible scenario. In the worst affected CDEM Groups, it is likely there will be no power, telecommunications, wastewater or potable water available within the first seven days following the credible scenario. It is important regional response planning plans for a response where these services are not available for a prolonged period of time.

Figure 4: Lifeline impacts – transport infrastructure (overleaf)

The figure overleaf shows the estimated damage and restoration times for transport infrastructure following the credible scenario. As shown in the figure, a large Hikurangi event could significantly affect inter-regional road connections, regional airports and ports. Significant damage or loss of this critical infrastructure would affect the way CDEM Groups respond to a large Hikurangi event and should therefore be considered as part of regional response planning.

Figure 1: Inter-regional support

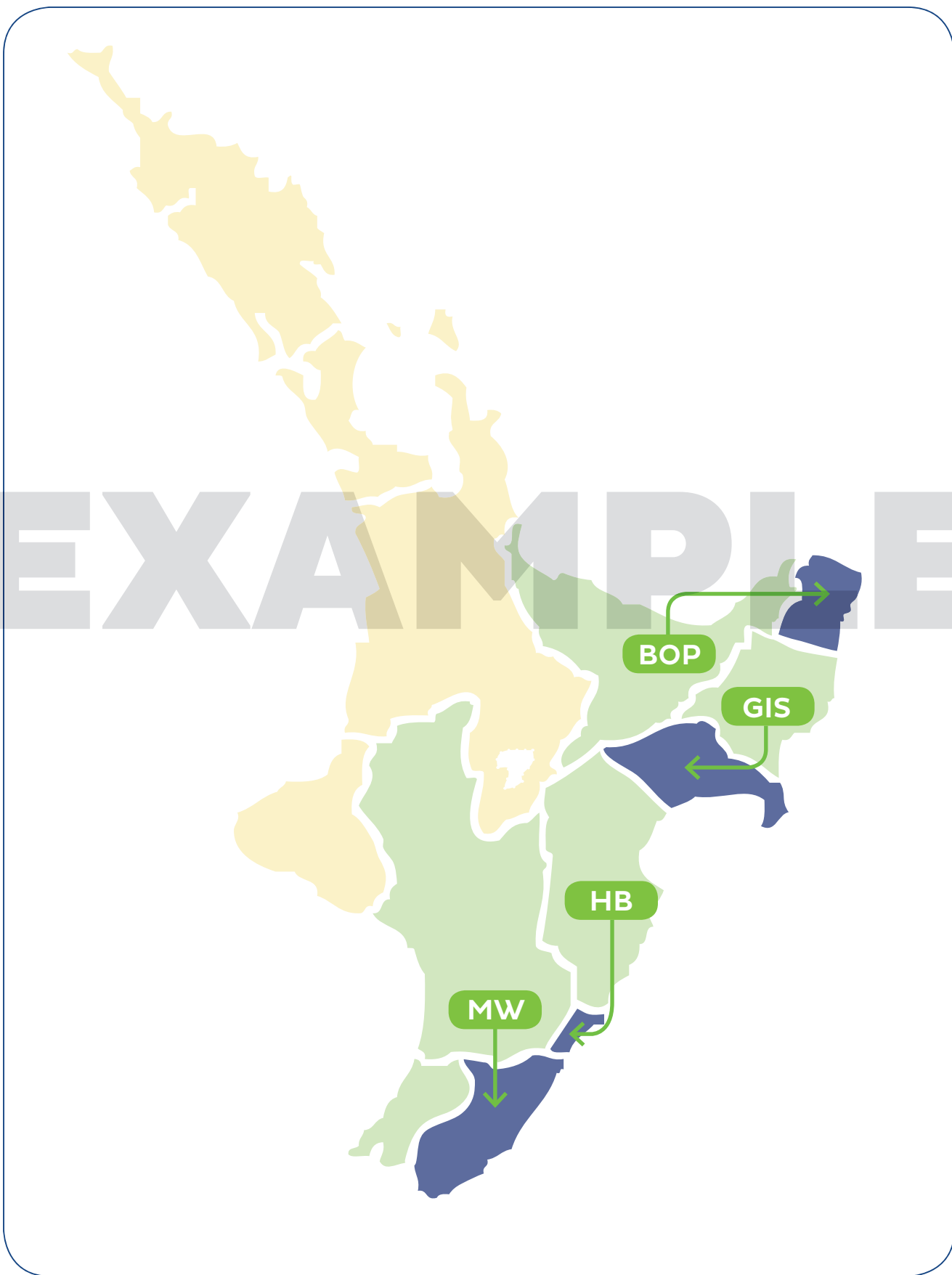


Figure 2: The 'island' concept



Figure 4: Example of estimated restoration times for logistics links and nodes (based on credible planning scenario).

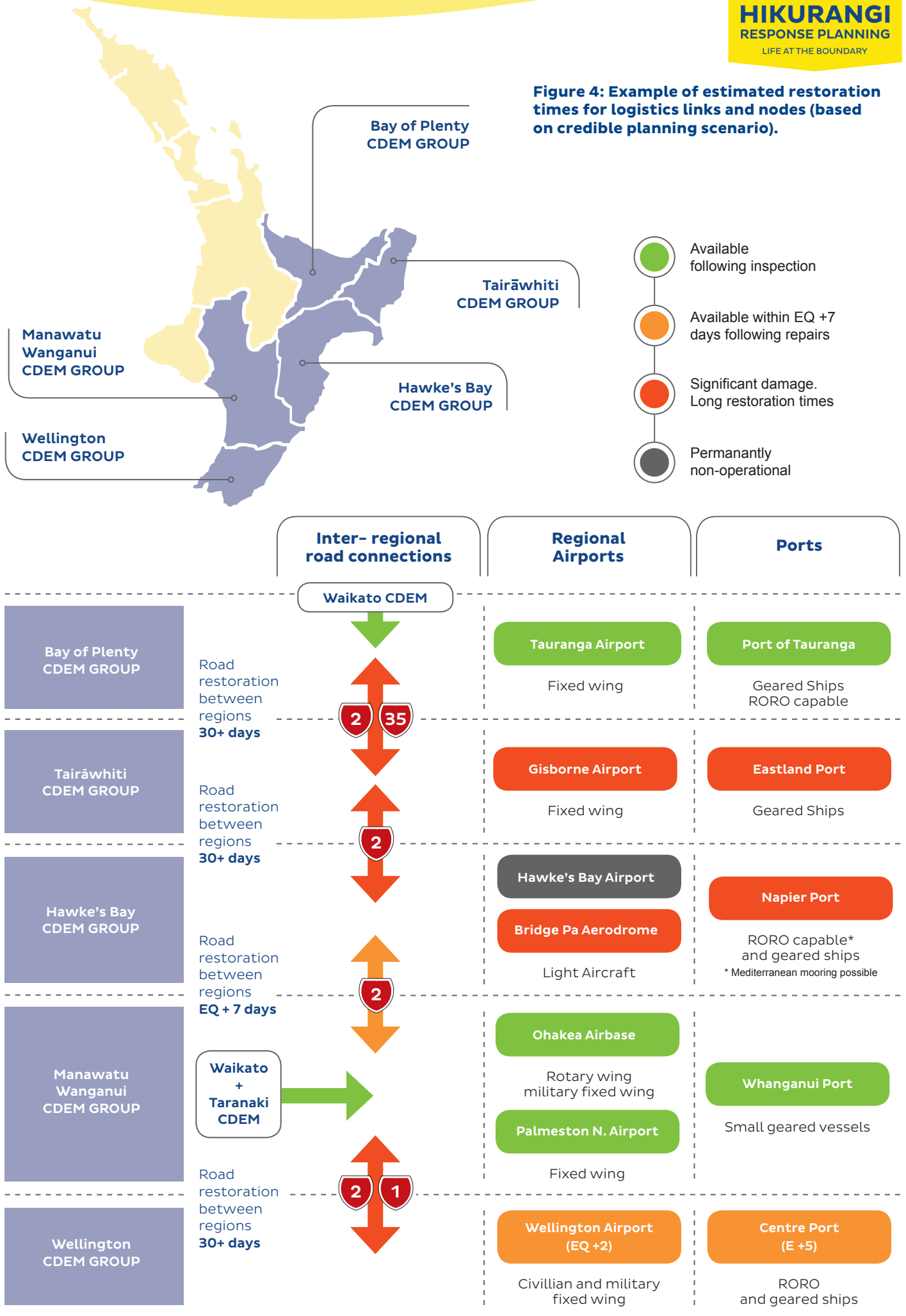
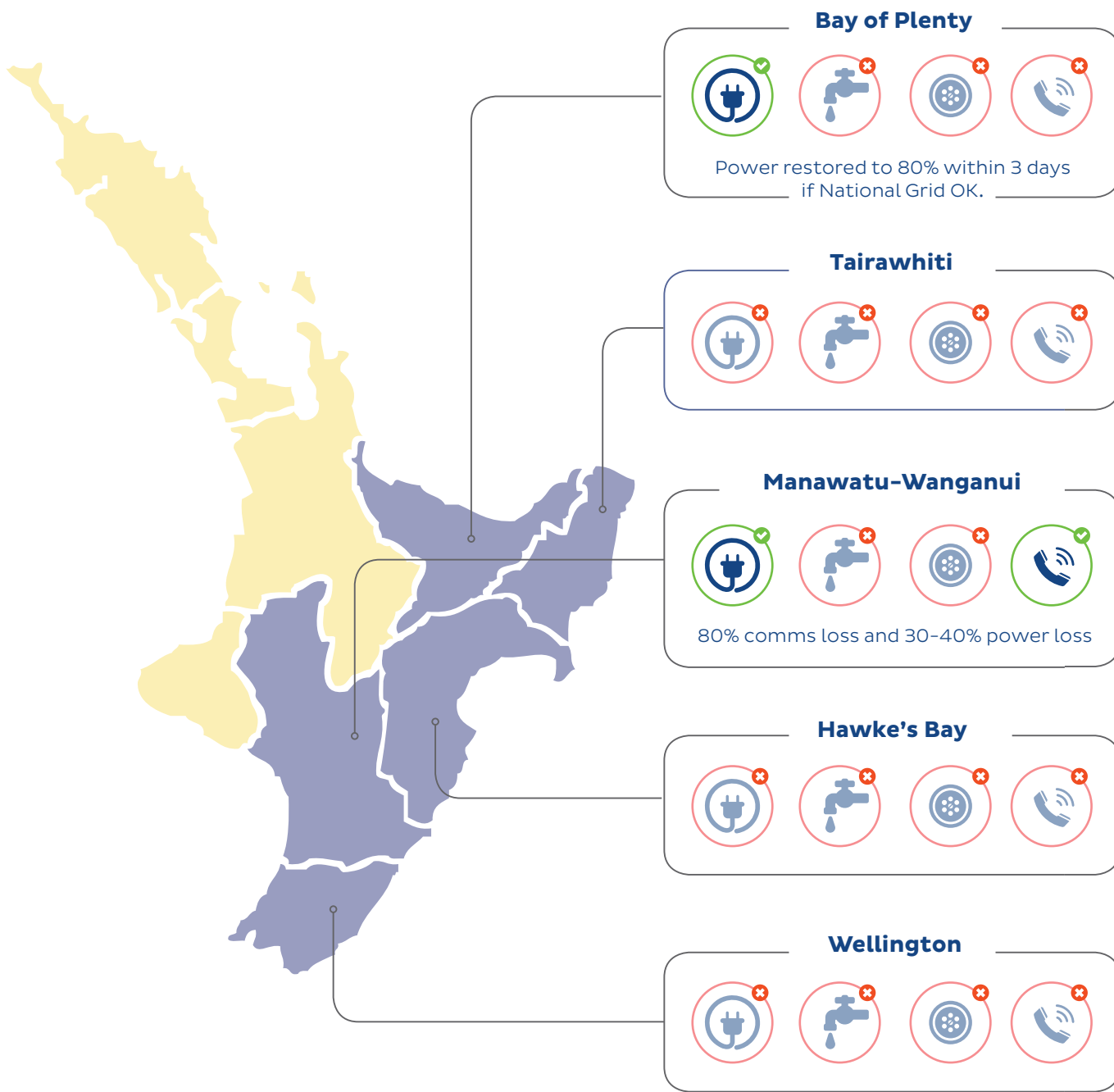


Figure 3: Example of lifeline utility availability in first seven days following credible scenario



KEY



Power



Potable water



Waste water



Telecommunications



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

TAIRĀWHITI CDEM GROUP

Hikurangi Subduction Zone Response Concept Paper 2020

Prepared by
East Coast Life at the Boundary (ECLAB)

Approved by:

Control Copy no:



TAIRĀWHITI
EMERGENCY MANAGEMENT

GROUP

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SECTION 1

INTRODUCTION



TAIRĀWHITI
EMERGENCY MANAGEMENT

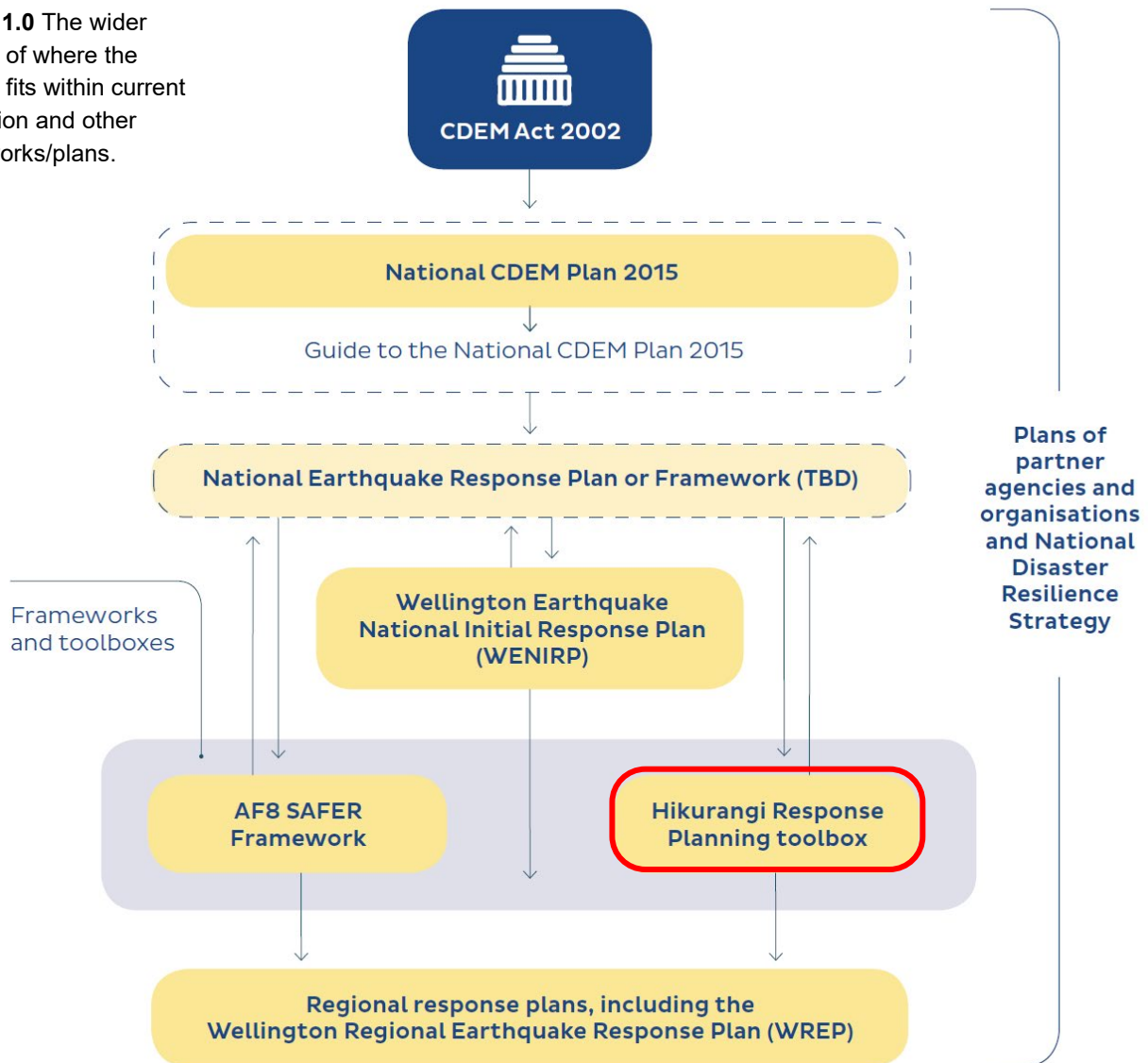
GROUP

1.0

Purpose of the document

The purpose of this document is to outline the proposed response arrangements within the Tairāwhiti region to guide the response to a large earthquake and tsunami generated from the Hikurangi Subduction Zone in advance of any planning under the proposed National Earthquake and Tsunami Response Framework (TBD). This Regional Response Concept paper fits within the Hikurangi Response Planning toolbox as pictured below.

Figure 1.0 The wider context of where the toolbox fits within current legislation and other frameworks/plans.



1.1

Scope

This concept paper is designed to be a guide for the Tairāwhiti CDEM response to a large earthquake and tsunami. It has used a credible magnitude 8.9 earthquake and tsunami planning scenario as a tool to aid planning. While many of the arrangements in this plan may be applicable to a range of events, there may be some requirement to modify or develop new arrangements for some events.

1.2

Legislative arrangements

The initiation of any response will be supported by several key pieces of New Zealand legislation:

- Civil Defence and Emergency Management Act 2002
- Health and Safety in the Workplace Act 2017
- Fire and Emergencies Act 2017
- Police Act 2008

1.3

Supporting plans and documents

This paper is reliant upon other plans to be enacted in support. This includes arrangements for coordination, evacuation, welfare provision and lifeline utilities. The following plans should be used to support the implementation of this response plan:

- Tairāwhiti CDEM Group Adverse Events Plan
- Tairāwhiti CDEM Group Welfare Plan
- Proposed National Earthquake and Tsunami Response Framework

1.4

Audience

This plan is intended to provide response guidance to the following audience:

- Tairāwhiti CDEM Group Members, namely:
- Gisborne District Council

- The Emergency Services
- Tairāwhiti District Health Board
- Regional Welfare providers
- Government agencies including; New Zealand Transport Agency (NZTA), Ministry of Business, Innovation and Employment (MBIE), Ministry of Primary Industries (MPI), Department of Corrections
- Lifeline utility providers
- Ngati Porou, Rongowhakaata, Ngai Tamanuhiri, Te Aitanga a Mahaki and other Tangata Whenua (Including post-settlement Groups)

1.5

Review

This concept paper will inform the proposed National Emergency Management Agency National Earthquake and Tsunami Response Framework. Nevertheless, depending on national framework progress this paper may be reviewed every five years, or as necessary, should any information regarding the implementation of any aspects of the response contained within change.

1.6

Exercising

This document will be exercised as part of the review process to ensure that the arrangements contained can be effectively implemented as required.

1.7

Response assumptions

In order to enable effective planning several assumptions have been made regarding coordination of the event at a national level, availability of resources, the ability to respond and the activities of the community. The core assumptions regarding this event are listed below. A more detailed description of these assumptions is shown in Appendix 1.

- The process of declaring local states of emergency will be initiated immediately.
- A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.
- CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.
- The National Crisis Management Centre will be activated (in Wellington or Auckland) but will be initially operating at a reduced level.
- Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.
- Local Government within the North and South Island will continue to operate but with reduced capacity and capability.
- Responding agencies will be functional but operating with reduced capacity and capability.
- Secondary hazards, including tsunamis, will occur throughout the response affecting response and recovery.
- Standard communications will be limited and so where available, alternate communications will be used.
- Lifeline utilities will be limited or unavailable in the worst affected CDEM Groups.
- Movement corridors will be affected, and many roads will be unusable.
- Rail will be inoperable within the five CDEM Groups.
- Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.
- Ports will be impacted by the earthquake and tsunami.
- Health and welfare services will be initially overwhelmed.
- Communities will be isolated.
- Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.
- Depending on the time of day significant numbers will be displaced from their home locations.
- The community led and Tangata Whenua response will work to meet communities immediate and basic needs where possible.
- Ordered mass-evacuation will not automatically occur.
- There will be significant and long-term environmental impacts.
- National and regional assembly areas will be established in accordance with national and regional plans.
- Offers of international assistance will be made and coordinated through the NCMC.



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SECTION 2

REGIONAL CONTEXT



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2.0 Regional overview

Population

The region of Tairāwhiti is located on the East coast of New Zealand’s North Island. The region has one main centre of population in Gisborne. The region has a population of approximately 47,500 (NZ Census data 2018) with around 86% living within 6km’s of the coast (Statistics NZ, 2006). It is estimated there are approximately 30,000 people within Tairāwhiti tsunami evacuation zones.

Approximately 23% of the population is aged under 14 years of age. 10% of the population in Tairāwhiti is aged 70 or more.

Local Government

The region has an amalgamated territorial and regional authority.

Economy

The primary industries within the region are forestry and agriculture, which make up almost 15% of the regional GDP. Tourism also plays an important part in the regional economy, with Gisborne providing the majority of hotel and motel accommodation.

Lifelines

The region is served by two state highways: SH2 connecting the region to Hawke’s Bay in the south and the Bay of Plenty in the east, and SH35 connecting the coastal communities along the East Cape, eventually leading to Opotiki and the Bay of Plenty.

In addition to road connectivity, the region has a seaport, and a regional airport. The rail link to Hawke’s Bay is no longer in operation.

Electricity is supplied by a 100kv transmission line from the South of the region (Hawke’s Bay).

2.1 Planning scenario overview

A credible planning scenario, developed by GNS Science (Power et al., 2018), has been used as a tool to develop the HRP Toolbox and this Regional Response Annex. A high-level overview of the scenario is provided in the

sections below. For the full scenario, please refer to Appendix A within Volume I of the HRP Toolbox.

The earthquake

The planning scenario starts with a magnitude 8.9 earthquake on the southern portion of the Hikurangi Subduction zone. This is a realistic large earthquake that would impact most of the subduction zone and is slightly lower than the maximum plausible magnitude of Mw 9.0. Shaking in the Tairāwhiti region would be extremely severe, between 9 and 10 on the modified Mercalli scale and lasting for over a minute. Landslides across the region would also be severe as a result of the shaking, cutting off the region from the rest of the country.

Offshore, the quake would cause widespread uplift of the seafloor right out the trench of around 2 – 2.5m. This uplift would result in the creation of a series of tsunami.

It is likely that significant aftershocks would continue for many weeks and months after the initial event, with some aftershocks exceeding Mw 7.0 and possibly requiring sustainment of exclusion zones or further evacuations of the population.

The tsunami

The earthquake would create a series of tsunami waves with average run up heights of 7 – 10 metres and exceeding 20 metres in some localised areas. Offshore waves exceed 5m in height. Inundation along the Tairāwhiti coast would be extensive, with flow depths of over 5 metres near to the coast and in some low-lying areas but averaging 1 – 2.5 metres across the majority of the region.

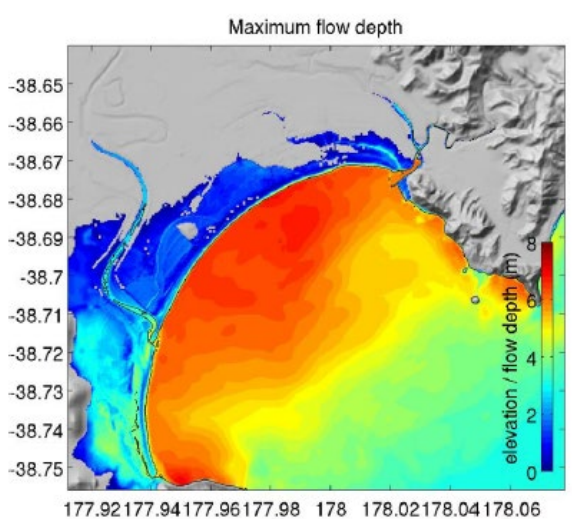


Figure 2.0: Modelled inundation flow depths for Gisborne and surrounds (Power et al., 2018)

The first wave would be expected to impact the region within 10 minutes of the earthquake occurring. Wave heights would peak around 20 – 40 minutes after the initial earthquake. A second larger wave would be expected to peak around 80 – 100 minutes after the quake (approx. 1.5hrs).

Alternative Scenarios

Several other scenarios were modelled to show the potential impacts to the region. These are shown in the GNS Science report. They included modelling a rupture of the fault further north from the above scenario, varying the slip distribution and a scenario focussing on a rupture in the area of strong coupling to the south of the Hikurangi zone.

In all the alternative scenarios Tairāwhiti is still significantly impacted by both the earthquake and the tsunami. Therefore, the measures contained within this plan should be suitable for a range of events that could potentially occur from a Hikurangi Subduction Zone event.

The impacts

Population

Widespread evacuation of coastal areas would occur inland and to areas of high ground. Landslides and infrastructure damage would make it difficult for some areas to easily evacuate post-quake.

The impacts of a Hikurangi earthquake and tsunami event would be catastrophic for the population of Tairāwhiti. It is estimated that there would potentially be hundreds of fatalities and thousands of injuries. Many thousands of people would be unable to return to their homes throughout Tairāwhiti with many more only having access to basic shelter and no access to utilities. Many small communities are likely to be completely isolated and lacking all utilities.

Built environment

Widespread landslides across the region would result in damaged roads and infrastructure. There would be widespread tilting of buildings on their foundations and some building collapse within the Gisborne CBD and moderate damage to other buildings within the region as a result of the earthquake

In addition, the tsunami would cause severe damage to residential areas along the coast, in particular to Gisborne City and its surrounds. Other coastal areas to the north of Gisborne would experience moderate to major damage from the inundation. Widespread debris and pollution within urban areas is likely to occur, complicating

immediate clean-up, opening of roads and restoration of lifeline services.

The state highway network would be impacted by both the earthquake and the tsunami, with landslides, bridge damage and tsunami debris causing the region to be cut off by road.

The Port of Gisborne would be inoperable following a large Hikurangi event due to extensive damage from the tsunami. No vessels would be able to enter the port, meaning there would be limited supply of fuel and other goods coming into the region. There is likely to be significant debris left floating in the harbour after the event, including large items like boats, logs and containers. These will pose significant maritime hazards as long as they remain floating in the harbour. These navigation hazards are likely to significantly impact the ability of any maritime response, for example, operations may only occur during daylight hours or vessel escort is required. Even after the Port is re-operationalised, floating debris may have the implication that vessels cannot enter the Port safely.

The Gisborne Airport would be unaffected by the tsunami but may be damaged by the earthquake. It would still be able to receive light aircraft and helicopters following structural assessment.

Electricity, water and sewerage would all be extensively damaged as a result of the quake requiring months to repair. Telecommunications would be mostly unusable for at least two weeks.

Scalability

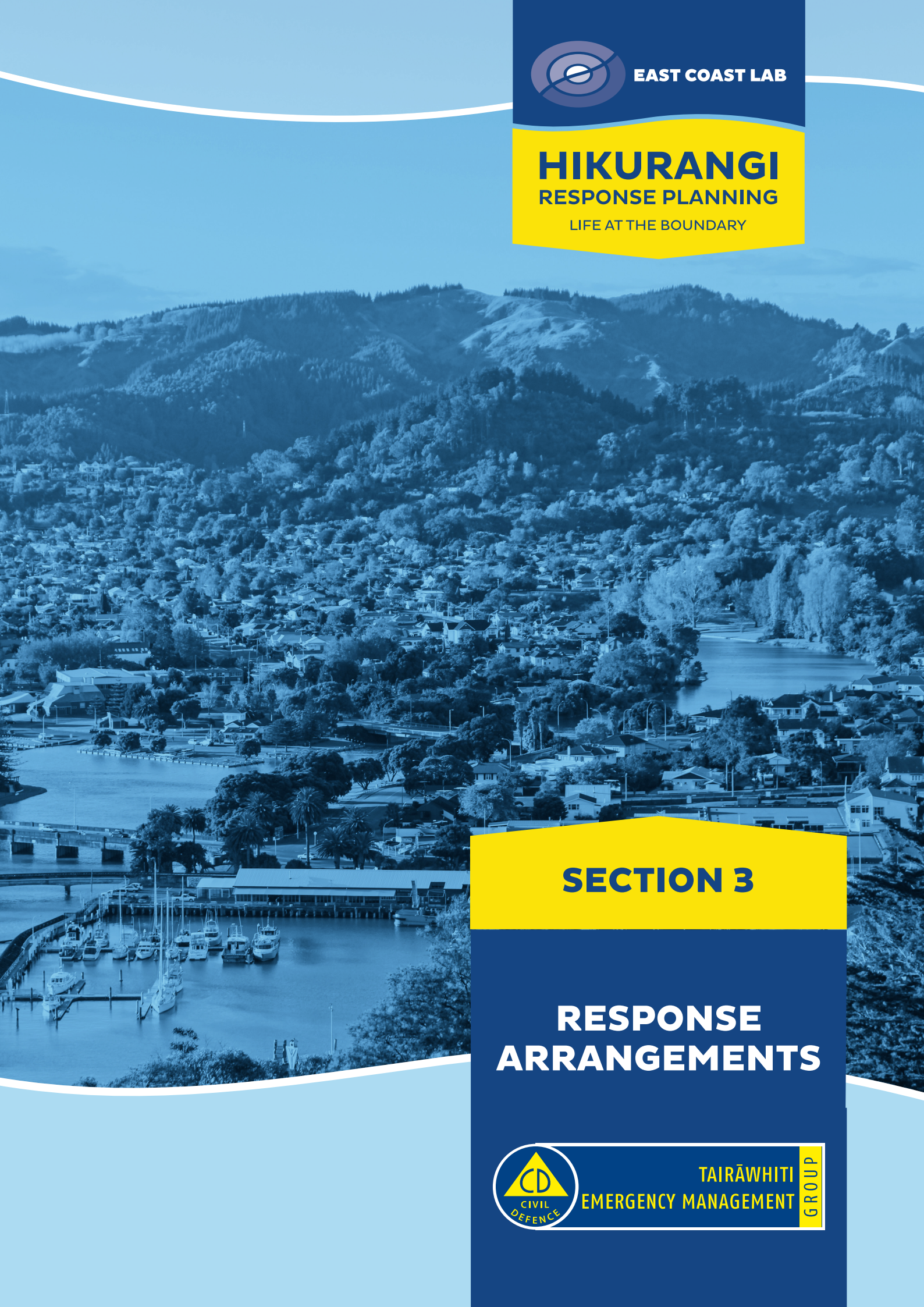
Please note that the response activities and objectives contained within this plan are designed to be scalable to a range of Hikurangi earthquake and tsunami scenarios for the Tairāwhiti CDEM Group, noting the planning scenario is only one of many possible scenarios which could occur on the Hikurangi subduction zone.



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SECTION 3

RESPONSE ARRANGEMENTS



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3.0

Response arrangements

Initiation of response

The initiation of a response will be as a result of a long or strong earthquake occurring. Initially it will be unknown if the earthquake is associated with the Hikurangi subduction zone and therefore if a tsunami has been created.

Group Controller's Intent

To immediately initiate a coordinated, timely response to minimise loss of life and prevent escalation of suffering. Provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles.

This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

Limiting factors

The following factors may limit the Tairāwhiti CDEM Group's ability to implement the activities detailed within each of the response phases:

1. Estimated time of arrival for first wave

The first waves from a major Hikurangi event would be expected to arrive around 10 minutes after the earthquake occurs. This will leave minimal time for self-evacuation activities and no time for more formal evacuation arrangements to be implemented.

2. Landslides

A result of the earthquake will be widespread landslides across the region due to the steep nature of the land. This will cause the region to become completely isolated from

the rest of New Zealand and will create issues with access into and out of areas within the region. There will be large landslides on all highways leaving Gisborne town itself and some small communities potentially be inaccessible for several weeks. In addition, many landslide dams will have been formed.

3. Resource availability

The impacts of the earthquake and tsunami may make resources scarce until supply lines can be established from outside the region. Lack of resources (perceived or real) may result in panic buying or looting.

4. Lifeline utility damage

Lifeline utilities will be extensively damaged as a result of the event adding complexity to the ability to carry out response activities and establish a coordinated response. High demand for contractors, specialists, equipment and 'parts' is likely to delay the restoration of lifelines. Note also that many of the Lifeline agencies rely on the availability of contractors and specialist resources for response activities

5. Continued risk of tsunami

The risk of tsunami will continue for up to 24hrs after the initial wave has impacted. There will also be risk of further tsunami with any significant aftershocks. This will prevent some response activities from occurring until safe access to an impacted area can be established.

6. Continued risk of aftershocks

There will be a continued risk of large aftershocks occurring for many weeks and months after the initial event. These may cause further damage, result in the need for additional evacuations and potentially result in further tsunami events occurring.

7. Number of displaced persons

This event will result in thousands of people becoming displaced in Gisborne and the surrounding area including response staff, which will significantly impact the ability to respond. Quick reconnaissance of where people have been displaced to will be required to ensure aid reaches all those in need.

In addition, a number of the coastal settlements will no longer be inhabitable, and their populations displaced into the surrounding area.

3.1 Roles and responsibilities

Organisation	Role and responsibility
Tairāwhiti CDEM GECC (incl. Gisborne District Council)	<ul style="list-style-type: none"> • Ensure coordination of the response across partner agencies and responding organisations • Ensure staff are trained to support response both regionally and locally • Ensure provision of core services including key lifeline utilities
NZ Police	<ul style="list-style-type: none"> • Ensure public safety • Maintain law and order • Manage public movement • Lead Disaster Victim Identification (DVI) process, mass casualty teams, reporting deaths to the Coroner's office and provision of inquiry services for missing persons. • Lead the investigation of any large-scale fatalities to report on criminal responsibility (Please note this would not be a priority within the first 24hours) • Where mass fatalities occur as a result of a scenario which severely impacts the Bay of Plenty Region, NZ Police would be responsible for the establishment and management of mass fatality temporary morgue facilities on behalf of the Coroner. These internal Mass Fatality Morgue plans are already in place and were updated as a result of COVID-19. • Activate Business Continuity Plans
Fire and Emergency New Zealand	<ul style="list-style-type: none"> • Lead response to all fire and hazardous substance related issues, urban search and rescue activities and coordinate the rapid impact assessment process • Activate Business Continuity Plans
Hauora Tairāwhiti	<ul style="list-style-type: none"> • Ensure provision of hospital and key health services within the region • Activate Business Continuity Plans
St. John Ambulance	<ul style="list-style-type: none"> • Provide rapid response medical care as required and transportation of injured persons to health facilities. • Activate Business Continuity Plans
Gisborne District Council (Unitary Authority)	<ul style="list-style-type: none"> • Ensure staff are trained to support response both regionally and locally. • Ensure provision of core services including key lifeline utilities. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
Welfare Agencies	<ul style="list-style-type: none"> • Ensure the provision of welfare services to persons impacted by the event as required. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
Lifeline Agencies	<ul style="list-style-type: none"> • Ensure the provision of core lifeline services to the region to the maximum possible extent. • Activate Business Continuity Plans
Iwi	<ul style="list-style-type: none"> • Provide cultural and communications advice regarding the response to Tangata Whenua within the region • Coordinate links to Māori communities to provide key emergency information and status reports • Iwi are requested by TEMO to provide initial welfare platforms for the affected population with food provisions and collective accommodation assistance on Marae. This assistance will be required until the CDEM lead is effective and influential in Phase 2 or 3 of this paper. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level

3.2 Coordination arrangements


In the early stages of any response there will be difficulty coordinating the activities of responding agencies until an appropriate command and control structure can be implemented.

Response structure

The Tairāwhiti CDEM Group will endeavour to establish the Tairāwhiti CDEM Group ECC response structure according to the Coordinated Incident Management System (CIMS).

Establishing response facilities

It is highly likely that some key response facilities of core agencies will be heavily impacted by the event. The key response facilities that will be established as soon as practicable are listed below:

Response Facility	Location
Alternate Group Emergency Coordination Centre (GECC)	To be determined- <i>It is recommended that an Alternate GECC for TEMO is identified.</i>
Emergency Services Base of Operations	
Community Emergency Centres (CEC) (See website for details)	Urban: <ul style="list-style-type: none"> • Awapuni School • EIT Tairāwhiti • Ilminster School • Gisborne intermediate • Kaiti School • Te Poho o Rawiri Marae (Kaiti) • Mangapapa School • Te Hapara School • Whataupoko Central School
	Rural: <ul style="list-style-type: none"> • Waerenga-a-hika Sports Club • Whakato Kohanga Reo

<ul style="list-style-type: none"> • Muriwai School • Ormaond School • Patutahi Fire Station • Te Aroha Station • Puketawa Station • Tiniroto School • Waimata Station • Ranui Station • Wainui School • Whangara School
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3.3 Response Phases

Four response phases have been used to describe the outcomes, actions and core response activities following a large Hikurangi event. The response phases cover:

• Prelim Phase (Readiness)

The following recommendations relate to readiness and response activities which are best completed before a large Hikurangi event to enable the response. The recommendations are adapted from Volume II of the Hikurangi Response Planning Toolbox, where further details as to the considerations associated with event impacts can be found.

Prelim phase recommendations are included in Appendix 4 of this concept paper.

• Phase 1 (Immediate response)

The immediate response, where emergency services are reacting to the earthquake and tsunami which has just occurred – this phase is dominated by activities which enable lifesaving and life preservation.

• Phase 2 (Initiation of sustained response)

The gap between the immediate, uncoordinated response and one that starts to become self-sustaining. During this phase, response agencies have interim operating capability.

• Phase 3 (Sustained response)

A self-sustaining response bolstered by domestic and/or international resources where required. All responding entities are at full operating capacity and capability

An event timeline with key outcomes/actions and core response activities for Phase 1-3 is detailed below.

Event timeline

	Event	Outcomes/Actions	Core response activities
Phase 1	Earthquake occurs	<ul style="list-style-type: none"> • Mainshock causes extreme damage across the Tairāwhiti region and wider East Coast of New Zealand including building collapse • Coastal populations begin self-evacuating inland and to higher ground in un-coordinated fashion • Some evacuation routes are severely damaged and people are unable to easily move to safety • Emergency Services direct people to evacuate whilst moving key assets to safe locations and inland • Electronic national and regional warnings issued for tsunami, however due to lifeline damage from the mainshock, are not able to reach most of the Tairāwhiti population 	<ul style="list-style-type: none"> • Alerts and notifications • Warning and informing (Public) • Self-evacuation and life safety activities • Response activation and mobilisation • Establishing communications
	First tsunami reaches shore	<ul style="list-style-type: none"> • Severe landslides have occurred across the region • First tsunami wave has reached shore and inundation of low-lying areas has begun • Population continuing to self-evacuate 	
	Major inundation from first wave	<ul style="list-style-type: none"> • Major inundation from tsunami now occurring along coast of Tairāwhiti region • Some of the population has been unable to move to safety, others are still in the process of evacuating • Major damage occurring to key infrastructure such as the port, state highways and airport as a result of inundation across the region 	
	Displaced population arriving in safe areas	<ul style="list-style-type: none"> • Community unsure of what to do. Spontaneous first aid and assistance provided to evacuees by locals with resources at hand • Emergency Services carry out initial actions plans, responding to immediate needs of those in safe areas and triaging medical assistance. • USAR and general rescue operations activities begin with in situ regional resources • Evacuation of status 1 casualties begins • Rapid impact assessments carried out in safe areas • Response staff in affected areas check on their families • Community-led response begins 	
	Tairāwhiti CDEM Group activate response	<ul style="list-style-type: none"> • Key staff alerted and begin travelling to the GECC where able • Emergency Services activate base of operations [REDACTED] 	
	Basic communications established	<ul style="list-style-type: none"> • Basic radio communications is established between key agencies • Information gathering begins, however, there is limited situational awareness 	

Phase 2	Delivery of rapid relief	<ul style="list-style-type: none"> • Community efforts to provide rapid relief to displaced and impacted persons bolstered • Community halls, marae, schools and sports facilities opened to provide shelter and basic needs 	<ul style="list-style-type: none"> • Providing Rapid Relief • Developing situational awareness • Managed evacuative and exclusion • Operational planning • Management of resources
	Tsunami activity subsides, aftershocks on-going	<ul style="list-style-type: none"> • Rapid impact assessment undertaken in areas where inundation has occurred • Emergency Services begin responding to immediate needs of those within the areas impacted by tsunami who have survived • Ongoing aftershocks have the effect of pausing response activities, recommencing when risk of further tsunami assessed 	
	Basic situational awareness gained	<ul style="list-style-type: none"> • CDEM Initial action plan developed • Resources coordinated and deployed to priority areas • Evacuation of other casualties as required begins, and as transport is available • Identification of additional resource shortfalls and requests for support to NCMC begins • Coordinated impact assessment begins 	
	Surge support arrives	<ul style="list-style-type: none"> • Some international and domestic assistance starts to arrive but is limited because of wide spread damage especially in North Island (Note accommodation for some of these personnel may be required) • Preparation of Regional Assembly Areas begin • USAR operations increase, with deployment of additional international teams into affected areas 	
Phase 3	Welfare coordination established	<ul style="list-style-type: none"> • CDC's activated to meet basic needs of population • Basic needs assessment process is conducted 	<ul style="list-style-type: none"> • Coordinated welfare delivery • Restoration of essential lifeline services • Supporting community response and engagement • Debris and Environmental Management
	Supply chains established	<ul style="list-style-type: none"> • Supply of essential goods into the region occurs via air to Gisborne Airport • Supermarkets and spontaneous 'hubs' (e.g. general stores with household items such as clothes) controlled by CDEM to ensure supplies are managed 	
	Basic lifeline utilities re-established in inland areas	<ul style="list-style-type: none"> • Electricity is available to some parts of the region • Basic mobile phone connections are re-established inland • Water supply is restored to some areas 	
	Community response supported	<ul style="list-style-type: none"> • Community initiatives supported with resources 	
	Sustained response activities occurring	<ul style="list-style-type: none"> • On-going welfare needs of the population are met including food supply and medium-term accommodation for displaced persons • Lifelines are continuing to be restored in impacted areas • Communication is improving • Supply chains are improving, and increased resources are arriving to support the response • Environmental clean-up occurring 	

3.4

Phase one- immediate response activities

Phase 1 response priorities

The following priorities exist for Phase 1 of the response:

- Conduct life safety activities
- Protect key resources needed for response
- Establish response coordination arrangements

Alerts and notifications

The natural warning signs (A long OR strong earthquake) will be the main alert to a major event occurring for all agencies. Given the nature of the event it may not be possible for the Tairāwhiti CDEM Office to issue a regional warning, however, they should still endeavour to do this from a safe location, as it may still be received by some.

In addition to this alert it is assumed that a national warning will have been issued via the Emergency Mobile Alerting system and that this has been received where there is still capability in the communications networks (e.g. battery backup to cell phone towers).

As the event progresses alerts may need to be issued via other methods such as through digital radio.

Core objective:

To ensure that responding agencies within the region are alerted to issues relating to the event

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Ensure that regional warning system is utilised where possible to keep all responding agencies informed. • Implement alternate alerting methods where regional warning system is not able to be used.
All other agencies	<ul style="list-style-type: none"> • Ensure that alerts and notifications are disseminated to all key staff

Warning and informing (Public)

Due to the nature of the event warning and informing the public may not be possible across many platforms.

In the early stages of the event (Immediately after the initial earthquake has occurred) there would be a reliance upon the population acting based on the long or strong messaging that is used to promote natural warning signs.

There may be limited phone signal as a result of the quake, but it must be assumed that a national warning would be put out using the Emergency Mobile Alerting platform and where the capability was still operational this could be received by anyone with a mobile phone.

As the event progresses other platforms for communicating with the public may start to become available with the restoration of communications, however, during Phase 1 and 2 of the response communicating will be restricted.

The Tairāwhiti CDEM digital radio network may still be operational following the quake and could be used in the first instance to communicate with impacted communities where radios exist. This will be reliant upon digital radios in the communities being switched on and able to operate effectively.

Note: Many radio units within the community are located in coastal communities that may be heavily impacted by the event

Core objective:

To ensure the timely provision of key emergency information to people impacted by the event

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of emergency information to the community across all available platforms
All other agencies	<ul style="list-style-type: none"> • Ensure key emergency information is provided to the community in coordination with the Tairāwhiti CDEM PIM Function

Self-evacuation and life safety activities

It is assumed that there will be mass self-evacuation from coastal areas following the earthquake and this will be strongly encouraged in any warnings that are issued. However, it is extremely likely that there will be severe congestion, and some may be unable to evacuate to safety in time due to damage as a result of the earthquake, or their distance from a safe area. All efforts should be made by responding agencies to assist people to evacuate while ensuring that critical staff and resources are evacuated to safety to support the response.

The preceding earthquake is likely to cause considerable damage within the region resulting in injuries and deaths. Initial focus for life safety activities should be directed towards those who have evacuated to a safe area or have been impacted by the event in areas away from the coast. Once it is safe to do so, and there is reduced risk to personnel and assets, the focus of life safety activities will move to those impacted by both the earthquake and the tsunami near to the coast.

Core objective:

To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Provide clear direction with regards to safe zone locations and evacuation routes
NZ Police	<ul style="list-style-type: none"> • Direct people to evacuate from areas at risk of inundation • Support traffic management where safe to do so
FENZ	<ul style="list-style-type: none"> • Coordinate USAR activities in impacted areas as the situation allows
St. John Ambulance	<ul style="list-style-type: none"> • Provide medical assistance to those impacted by the event as the situation allows • Support FENZ with USAR activities by providing medical assistance

	<ul style="list-style-type: none"> • Transport injured persons to healthcare facilities
Hauora Tairāwhiti	<ul style="list-style-type: none"> • Ensure capability to meet the medical needs of the impacted population

Response activation and mobilisation

In the initial phase of the event responding organisations will be utilising existing SOPs to respond accordingly. However, in order to ensure coordination across all agencies there will be a need to establish response facilities and mobilise personnel and resources to carry out key response activities.

The process of activation and mobilisation may be made extremely difficult by the lack of communications and accessibility of facilities. It is also highly likely that some staff and resources will have been lost due to their location at the onset of the event. In addition, severely damaged coordination facilities will require structural assessment by a suitably qualified building inspector before re-occupation.

Focus should be placed on ensuring the Group ECC is activated (alternate location TBD) as soon as possible to provide a base for the coordination of the response. In addition, the emergency services should focus on establishing the Base of Operations [REDACTED] to manage the on-going life safety activities.

Core objective:

To activate appropriate response facilities to enable coordination of the response at all levels

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Utilise all systems available to mobilise response staff and activate the GECC (alternate location TBD) • Support key staff to access the GECC facility as required
Emergency Services	<ul style="list-style-type: none"> • Activate the Base of Operations [REDACTED] and mobilise resources to respond

Establishing communications

The ability to communicate between responding agencies and on the ground between responders is critical to enabling a coordinated and effective response to the impacts of the event. It is highly likely that the standard form of communication normally used will either be severely compromised or completely inoperable (e.g. landline and mobile phone networks, internet) and therefore other methods will need to be utilised.

The core focus in the initial phase of the response should be on utilising the Tairāwhiti CDEM digital radio network to establish communications between agencies. Individual agencies may still be able to use their own radio network to communicate internally. In addition, the Tairāwhiti CDEM GECC should utilise the satellite communications equipment available to establish connections to the NCMC and support other response activities.

Core objective:

To establish appropriate communication to enable coordination of the response and information sharing between key agencies

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Ensure the operability of the Tairāwhiti CDEM Group digital radio network to support communication between responding agencies • Deploy satellite and/or digital radio communications to enable communication with the NCMC and the Emergency Services Base of Operations
All other agencies	<ul style="list-style-type: none"> • Ensure operability of digital radio and satellite communications equipment to enable communication between the GECC and all responding agencies and internally with key response staff

3.5

Phase two- initiating sustained response activities

Phase two response priorities.

The following priorities exist for Phase 2 of the response in Tairāwhiti:

- Ensure immediate needs of the population are met
- Gain situational awareness
- Prioritise and manage resources

Providing rapid relief

Providing rapid relief in the early stages of the event is critical to ensuring that people can get through the initial impacts. Rapid relief includes food, water, shelter, and urgent medical needs.

This event is likely to require rapid relief provision to many thousands of people. The provision of rapid relief is likely to be hampered by the dispersed population and the access to resources. In the initial phase of the response the rapid relief provided may be extremely basic and rely heavily upon the community to support the effort until more coordination can be established and appropriate resources deployed.

Core objective:

To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses, marae etc) • Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event

Welfare Providers	<ul style="list-style-type: none"> • Ensure provision of rapid relief in support of the GECC
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Developing situational awareness

Gaining a clear understanding of the event and ensuring that all responding agencies have a shared understanding of what has happened is vital to enabling clear and effective decision making. In the early phase of the response developing situational awareness will be made difficult due to the lack of communications, restriction on movement due to road damage, potential loss of personnel and ability to establish response facilities.

Initial situational awareness may come from responders attending facilities and their observations of the event and the impacts. As the response progresses and communications are established between responding agencies coordinated impact assessments may begin to occur. These may be rapid impact assessments (general ground observations of the situation) in the first instance, but as time allows these will become more detailed and include street by street damage assessments, welfare assessments and lifeline asset damage assessments. As the event progresses the situational awareness of all agencies should increase enabling more targeted response efforts in the worst impacted areas. For the development of situational awareness to be effective it is critical to establish clear communications between responding agencies as soon as possible to enable status reporting to the GECC and ensure that key information is disseminated to all agencies.

Core objective:

Develop a clear understanding of the impacts of the event as soon as possible to support decision making.

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies

	<ul style="list-style-type: none"> • Lead the welfare impact assessment process • Conduct building damage assessments • Conduct utility damage assessments
Fire and Emergency NZ	<ul style="list-style-type: none"> • Lead the rapid impact assessment process and coordinate the collection of information by other emergency services • Provide regular status reports to the Tairāwhiti CDEM GECC
NZ Police	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
St. John Ambulance	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
Hauora Tairāwhiti	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
Welfare Agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
Lifeline Utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments • Provide regular status reports to the Tairāwhiti CDEM GECC

Managed evacuation and exclusion

As situational awareness increases and there is more ability to respond in impacted areas, evacuations and exclusions may need to be implemented to prevent further risk to the population. This may be as a result of additional risk from the impacts (e.g. landslide risk, health risks etc) or to enable response activities to occur without risk to people in the area.

Evacuation of an area will require a door-to-door approach to be taken, as it is most likely that

communications will be extremely limited in the early phases of the response. In addition, the resources to conduct managed evacuations are likely to be extremely limited.

Exclusion from areas will be required to prevent people returning where there is an increased risk or to maintain security until residents are able to return. The establishing of cordons may not be possible in the early phases of the response until appropriate resources become available and may not be possible at all in some areas due to the logistical requirements.

Core objective:

To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Identify areas for evacuation / exclusion and coordinate resources to support NZ Police
NZ Police	<ul style="list-style-type: none"> Conduct evacuations as requested by the Tairāwhiti CDEM Group Establish cordons and exclusion zones

Operational planning

In the initial phase of the response most activities will occur based on existing SOPs and plans of each agency. While some of the activities will have a level of coordination on the ground, there is likely to be some duplication of effort and confusion in exactly what needs to happen and a higher level of planning required to enable coordination across the entire response.

Initial action plans for the event are likely to be very basic and lack detail due to the limited information and scale of the event (See Appendix 3 for a draft event action plan). Operational planning can only begin to occur once clear communication has been established between agencies and there is a reasonable level of situational awareness regarding the impacts of the event and the issues that require response.

Core objective:

To ensure a coordinated response through a consolidated planning process across all responding agencies

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Coordinate the development of the Tairāwhiti CDEM Group Action Plan
All other agencies	<ul style="list-style-type: none"> Contribute to the development of the action plan by identifying key tasks, issues and resource requirements

Management of resources

Due to the extent of the impacts, resources to respond are likely to be severely impacted. Careful management of these will be required at an early stage to ensure that priority issues can be responded to effectively.

In order to manage resources effectively, the Tairāwhiti CDEM Group will first need to understand what resources have survived the event and are available to respond. It will be critical for all responding agencies to identify their available resources at an early stage and provide this information to the Tairāwhiti CDEM GECC so that resources can begin to be used in the most effective way. Any critical resources need to be identified and prioritised for use or requested from the NCMC if not available in the region.

There is also likely to have been significant damage to supply lines and retail outlets, such as supermarkets and fuel sources. Existing supplies within the region will need to be managed and prioritised to ensure these are used as effectively as possible until resources can be brought into the region.

Core objective:

To ensure the most effective use of all available resources in response activities.

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise available response resources
All other agencies	<ul style="list-style-type: none"> Identify all available and critical response resources and provide to the Tairāwhiti GECC

3.6

Phase three- sustained response activities

Phase three response priorities

The following priorities exist for Phase 3 of the response in Tairāwhiti:

- Ensure on-going needs of the population are met
- Restore key lifeline services
- Support community response activities

Coordinated welfare delivery

The provision of welfare services to those impacted by the event will require coordination across multiple agencies and the community and will require significant resources to ensure people are able to manage through the event.

The region is likely to have significant numbers of displaced persons, including tourists, who have evacuated from the coast and cannot return to their homes. Potentially there could be thousands of people displaced long term as a result of the event, with many more only able to shelter in their homes and having limited access to utilities. While some of these people may be able to stay with friends and family in areas not as heavily impacted, a large majority will be reliant upon help to find accommodation and meet their basic needs for an extended period of time.

Many of the supermarkets are located within the Gisborne CBD and these are highly likely to have been heavily impacted by the inundation. The supply of household

goods and services will be a critical element of providing for the immediate and on-going needs of the population.

In addition, several areas of Tairāwhiti will be cut-off from support due to infrastructure damage and may have to provide for their own welfare for several days until supplies can be taken in. Settlements in the upper East Cape are likely to be separated from the rest of Tairāwhiti and critical supplies may need to be brought in from Gisborne and the Bay of Plenty in order to support the needs of the population there.

Core objective:

To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services.

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event including the provision of resources from neighbouring CDEM Groups where applicable
Welfare agencies	<ul style="list-style-type: none"> Support the provision of on-going needs as requested by the Tairāwhiti CDEM Group Identify any critical resource needs to enable the delivery of key welfare services

Restoration of essential lifeline services

Lifeline utilities are likely to have been very heavily impacted as a result of the event. The table below provides an overview of the estimated damage the event will cause. It is recommended regional response planning further quantifies and refines the likely damage to lifeline assets following a large Hikurangi event.

Energy

- Electricity and gas supplies are unlikely to be re-established for 3 months

Water

- Potable water supplies will be unavailable for a month. Wastewater will not be re-established for 3 months

Telecommunications

- Not operational for at least two weeks (min). Radio Broadcast non-operational
- Bridge loss to the south will take out key fibre communications

Transport

- Loss of many SH bridges. All SH's damaged and Tairāwhiti isolated by road due to landsliding. SH2 restoration may take several months.

Port

- The Port of Gisborne is not operational, wharfs and entrance damaged by the earthquake and tsunami

Airport

- Gisborne Regional Airport will not be inundated by the tsunami. It may be damaged by the earthquake, but may be operational after structural assessment

Lifeline restoration priorities

In tandem to the prioritised repair of logistics enablers listed below; power, potable water and storm water supply restoration in areas where people are still able to live will need to occur as soon as possible to reduce dependency on services such as water tankers and emergency power generation. Emergency power supplies, e.g. generators, should be prioritised for use by responding agencies.

In addition, fuel supplies in the region will be severely impacted by the event, and re-supply will be unlikely in the initial phases of the response. Without electricity, some fuel stations may also require generator support to access fuel stocks. Until inter-regional road connections and/or Port infrastructure is restored, the region will need to use pre-existing fuel in the region for the emergency response and generators. Until fuel stores are reinstated, storage of fuel will be limited therefore there will be a reliance on tankers

from outside the region to provide fuel until long term storage facilities are re-established. As a critical resource, distribution of fuel may need to be managed to ensure there is enough available for emergency operations.

1. Internal priority roads/access routes for emergency services:

In the early stages of the event priority will need to be given to clearing access routes to enable emergency response to occur and for the population to access assistance

2. Gisborne airport:

To enable the inwards movement of goods and response specialists, and the outwards movement of the critically injured needing specialist treatment

3. Inter-regional road connections to Bay of Plenty and Wairoa (SH 2, SH35)

Key supply routes will also need to be prioritised for restoration to enable resources to come into the region as soon as possible. It is likely Wairoa will be cut off from the Hawke's Bay in this scenario - the easiest access into Wairoa is likely to be from the north (Tairāwhiti) rather than south from the Hawke's Bay.

4. Eastland Port

Restoration of the Port will enable the inwards mass movement of goods.

All lifeline restoration is dependent on the availability of contractors, resources and access to lifeline assets. As these priorities are based on the planning scenario, please note they may need to be adjusted for the realised impacts of a future event.

Core objective:

Restore basic services to the community to the maximum possible extent.

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise the restoration of lifeline services • Undertake the restoration of basic services to the community where possible to do so
Lifeline Utilities Agencies	<ul style="list-style-type: none"> • Undertake the restoration of basic services to the community where possible to do so

Supporting community response and engagement

The community will play an integral part in the response and will be vital in ensuring that the wider community is able to manage through the impacts of the response.

In the early phases of the response it is highly likely the community will provide for the immediate medical and welfare of those impacted by the event. While this may be sustainable in the short term, it will require support from the Tairāwhiti CDEM Group as supplies become limited, or more expertise is required. Civil Defence Community Link teams in Gisborne (urban and rural), Te Araroa, Uawa, Waiapu and Waikohu will be an essential link between Tairāwhiti CDEM Group and the community-led response.

Communities are also likely to lead the response efforts in their area in terms of debris clearance and this will need to be supported by the Tairāwhiti CDEM Group to ensure it occurs in a coordinated fashion and does not put anyone at risk.

Where possible, existing community groups should be utilised to provide information to the wider community and coordinate response efforts in their area.

Core objective:

Enable the community to lead the response effort where appropriate through the provision of resources and advice.

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Lead community engagement and provide supplies and resources to sustain community response efforts
All other agencies	<ul style="list-style-type: none"> • Support community response efforts through provision of information, advice and resources

Debris and environmental management

The event will create a huge amount of debris, both from the earthquake and the tsunami. This is likely to require a large number of resources to clear and there will be a limited ability to separate any hazardous waste.

In the early phases of the response debris management may simply be piling up debris in place to clear access routes. Longer term, debris will need to be managed to ensure that hazardous substances and waste are cleared and stored where they pose no risk to human life. This may require the establishment of a specific facility to receive and sort waste and the development of additional landfill facilities within the region for disposal of the non-harmful waste. Hazardous and harmful waste will need to be transported to specific facilities outside the region but may need to be stored long term within the region before it can be disposed.

Core objective:

Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.

Agency	Responsibility
Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate the collection, removal, and disposal of debris • Support the Tairāwhiti CDEM Group to manage the collection, removal, and disposal of debris and environmental hazards

3.7

Inter-regional response requirements

Working with neighbouring regions

The event will impact most regions in New Zealand, given the scale of the quake and generated tsunami. As a result, support from neighbouring regions may need to be sought to assist parts of the Tairāwhiti region. This is most likely to be the case for the northern East Cape, which will likely be cut-off from the remainder of the region, requiring the Bay of Plenty region to provide assistance.

It is most likely that Tairāwhiti may also be requested to support some areas of neighbouring regions, in particular the Wairoa area, which is likely to be separated from the rest of the Hawke's Bay region.

Requesting support

Requesting support from a neighbouring region will require discussion between the National Controller and the two Regional Controllers. Memorandums of Understanding (MOU's) created in readiness may facilitate this occurring more quickly in response.

The requirements for inter-regional support are discussed in Volume II of the HRP Toolbox.

Priority inter-regional information requirements

The following diagram shows the TEMO priority inter-regional information requirements to enable the emergency response. These include the status of neighbouring CDEM Groups, and key logistics nodes (e.g. Port) and links (e.g. SHs) into the region and that link with the Tairāwhiti.

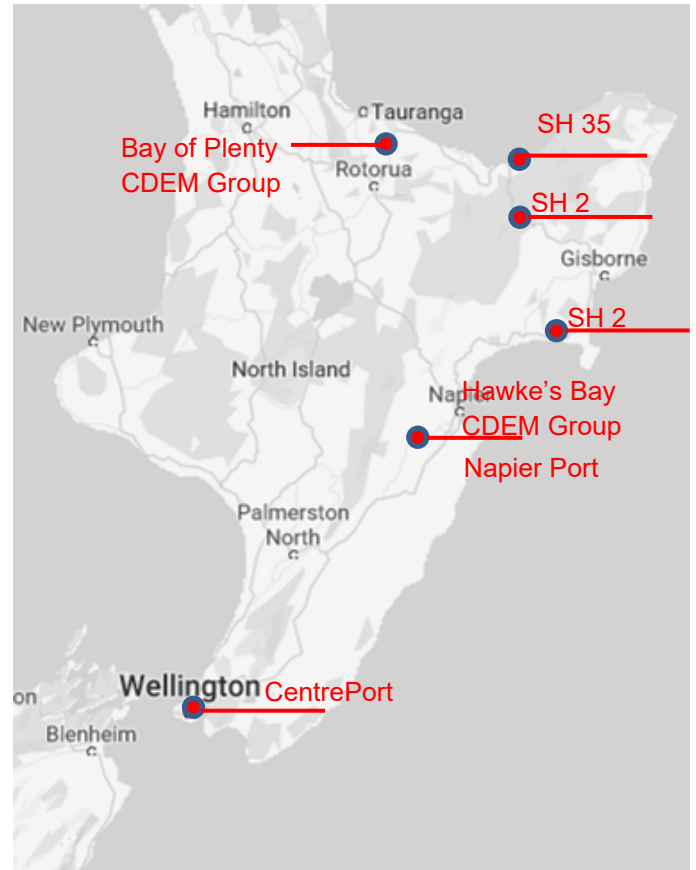


Figure: TEMO Priority inter-regional information requirements



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 4

LOGISTICS & LIFELINES



TAIRĀWHITI
EMERGENCY MANAGEMENT

GROUP

4.0

Logistical requirements

A number of logistical requirements exist that will enable the region to effectively respond to the impacts of the event.

Priority sites, emergency power supply and emergency water supply

As part of the regional response planning process it is recommended the following logistical requirements are documented:

- **Priority sites:** Identify sites which are a priority to re-establish basic lifeline services to, to enable them to function as soon as possible following an emergency. Stakeholders suggest priority sites include:
 - Gisborne Hospital
 - Gisborne Airport
 - TEMO Alternate ECC Location (TBC)
- **Emergency generators:** Identify the owner and locations of emergency generators in the region to enable emergency power supply
- **Emergency water supply:** Identify companies which may be able to assist with the provision of emergency water supplies

Key supply routes

The following state highways should be prioritised and re-established as soon as practicable to enable re-supply into parts of the region:

- State Highway 2 to Wairoa
- State Highway 35 to Hicks Bay

The Gisborne Regional Airport should be prioritised for restoration to enable the inward supply of resources from outside the region.

Communications

Tairāwhiti operates on a digital trunk radio network (DMR) system, with approximately 20 repeaters available in the network. Nine of these sites are in the Hawke's Bay, e.g. the Mahia repeater, allowing the two regions to communicate if the HB network radios are programmed appropriately.

Most main sites in the network have generator back-ups, and the system is resilient in that it is not reliant on specific repeaters to function.

The two main sites for the Gisborne township which should be prioritised for repair however are:

- Wheatstone Rd
- Wharekopae Rd

Fuel supply

There are no commercial fuel stations situated outside of Tairāwhiti tsunami evacuation zones. Depending on the impacts of an event, those on the periphery of the tsunami evacuation zones, e.g. Caltex Makaraka and BP Mangapapa, are likely to operational. Due to limited supply, these sites should be controlled to ensure fuel is available for the emergency response.

Supermarkets

The following supermarkets are situated outside of Tairāwhiti tsunami evacuation zones, and so may be able to operate following the event.

Operator	Location
Del Rio Suprette	2 Potae Avenue, Riverdale, Gisborne 4010
Four square Mangapapa	2 Winter Street, Mangapapa, Gisborne 4010
Mangapapa supermarket	2 Winter Street, Riverdale, Gisborne 4010
Supervalu Kati	Kaiti Mall 504 Wainui Road, Inner Kaiti, Gisborne 4010
Hospital Diary	269 Ormond Road, Mangapapa, Gisborne 4010



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 5

APPENDICES



TAIRĀWHITI
EMERGENCY MANAGEMENT

GROUP

Appendix 1: Response assumptions

Following a large Hikurangi event, it is assumed:

- **The process of declaring local states of emergency will be initiated immediately.**

A large Hikurangi event will have significant impacts on all five CDEM Groups. It is assumed local authorities and CDEM Groups affected will immediately initiate the process of declaring states of local emergency.

- **A state of national emergency is likely to be declared within the first 24hrs of the response.**

It is assumed a state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact. Ultimately, this is the decision of the Minister of Civil Defence, on advice of the National Controller and/or Director of Civil Defence Emergency Management.

Following declaration, the National Crisis Management Centre (NCMC) will direct the overall response. The NCMC will be situated in Wellington or at its secondary location in Auckland.

- **CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.**

A large Hikurangi event will significantly impact the five CDEM Groups. This will lead to a reduced level of operations immediately following the initial earthquake and subsequent tsunami impacts. It is not expected that the five CDEM Groups will be able to immediately activate and lead a coordinated response.

Each of the five CDEM Groups on the North Island East Coast have primary and secondary or mobile Emergency Coordination Centres (ECCs). Most Emergency Operations Centres (EOCs) have primary and secondary locations in each of the five Groups. The community, local, regional and multi-agency response will be led and coordinated from these centres including communication and coordination with other CDEM Groups and the NCMC.

- **The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.**

The NCMC will be functional but will initially be operating at reduced level. The NCMC will be able to coordinate the national response in Wellington or from its alternative site in Auckland.

- **Initial tsunami threat maps are estimated to be produced by the National Geohazards Monitoring Centre (NGMC) within 20-30 minutes**

Following a large Hikurangi event it is estimated it could take approximately 20-30 minutes for the National Geohazards Monitoring Centre (NGMC) to make an initial assessment and relay initial threat maps to the NEMA duty team using alternate communications, e.g. satellite phone and BGAN, if necessary. The NEMA Duty Team would then pass this information onto CDEM Groups to inform decision making.

- **Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.**

A large Hikurangi event will impact Groups wider than those scoped by this framework. This framework does not assume the five CDEM Groups will receive any assistance from near or neighbouring CDEM Groups as it is likely they will be dealing with their own impacts. Depending on their capacity, CDEM Groups in lower South Island and upper North Island (e.g. Northland CDEM) may be available to assist those most affected. Offers and requests for inter-Group assistance will be coordinated by the NCMC.

- **Local Government within the North and South Island will continue to operate but with reduced capacity and capability**

North and South Island authorities (local and territorial councils), will continue to operate but with reduced capacity and capability. Local government authorities, with regulatory oversight responsibility, will continue their same roles and responsibilities during the response, most likely at an initial reduced capacity.

- **Responding agencies will be functional but operating with reduced capacity and capability**

Responding local, regional and national agencies (such as emergency services, health services and welfare services) will self-activate within affected areas where those agencies have a presence. Like local authorities, national and regional responding agencies will initially be operating at reduced capacity.

- **Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.**

Triggered by a large Hikurangi earthquake, secondary hazards such as tsunamis, aftershocks, land subsidence and uplift/lateral spreading, liquefaction, landslides, rockfall, fire, flooding, dam collapse, building collapse, fire and seiching of large water bodies will pose an additional risk to life and will significantly impair the response and recovery processes.

- **Standard communications will be limited, where available, alternate communications will be used**

A large Hikurangi event will affect standard communications (including phones and internet) (See Section 3.1.5 for further detail). Responding Groups will need to rely on alternate methods to communicate. In some cases, alternate communication methods may also be impacted by the event (e.g. loss of radio systems due to tower collapse or loss of power to a tower). Communication may be hampered by the incompatibility of systems used by CDEM Groups and responding agencies.

- **Lifeline utilities will be limited or unavailable in the five CDEM Groups.**

Lifeline utilities, including the three waters, power and telecommunications, will be limited or unavailable in the five CDEM Groups for at least 7 days following the initial earthquake and tsunami impacts. Secondary hazards, such as landslides and aftershocks will impact the ability to restore these networks.

- **Movement corridors will be affected, and many roads will be unusable**

Landslides, lateral spreading and liquefaction will lead to many roads becoming unpassable, isolating some communities and CDEM Groups. This will significantly impact the supply chain and the mobility of responding agencies within and between regions.

- **Rail will be inoperable within the five CDEM Groups**

Rail networks in and between the five CDEM Groups, including the Wellington Regional network, Main Trunk Line and the Palmerston North - Gisborne Line (PNGL), will be unusable during response.

- **Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.**

All airports within the five CDEM Groups will experience severe shaking and will require assessment before being able to be declared operational. Even opened most will have operational restrictions due to the wider impacts, such as loss of power and standard communications.

It is assumed that Hawke's Bay airport will be permanently non-operational due to forecasted subsidence reclaiming the land to sea. Wellington airport is likely to be impacted by tsunami debris and not expected to be available until E +3 days. Gisborne and Palmerston North Airport are anticipated to be operational following assessment.

Additional assessments will be required following any substantial aftershock or tsunami.

- **Ports will be impacted by the earthquake and tsunami.**

Tauranga, Gisborne, Napier and Wellington Ports will be affected by earthquake and tsunami. Tsunami debris will likely damage critical assets such as piers and wharves, limiting their use until repaired. Liquefaction may also compromise foundations, destabilising port infrastructure. Assessments and harbour surveys will be required before the ports can be opened.

Additional assessments will be required following any substantial tsunami.

- **Health and welfare services will be overwhelmed.**

The large number of injuries and fatalities expected will overwhelm health services within the five CDEM Groups (See Appendix A.2: 'SitRep') Welfare services will be overwhelmed, especially due to the persons displaced, and possibly separated, during the immediate mass evacuation.

There will be significant international concern over family and friends who are unable to be contacted in the immediate aftermath of the response.

- **Communities will be isolated.**

Many communities will become isolated due to transport infrastructure damage or physical barriers, e.g. lateral spreading, wash outs, tsunami debris, liquefaction and/ or landslides. Depending on the scale of damage, it may take days to weeks to reach some isolated communities

- **Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.**

Many members of the public will self-evacuate (as encouraged through the 'long or strong, get gone' messaging) inland or to higher ground following the earthquake shaking.

A large proportion of those who self-evacuate will require assistance after reaching higher ground, inland areas or buildings if vertical evacuation has taken place. They may only have the items they evacuated with and will therefore have immediate needs - delays meeting these needs are likely to worsen health outcomes.

- **Depending on the time of day significant numbers will be displaced from their home locations.**

A large Hikurangi event could occur at any time. A daytime event in the working week will result in many people unable to return home in the initial response phase. These displaced people will need their immediate needs met. These displaced people will want to return to their families and home as soon as possible.

- **The community-led and tangata whenua response will work to meet communities immediate and basic needs where possible.**

Spontaneous community volunteer groups are to be expected to activate, and marae manaaki (hosting) is very likely where buildings are safe. Iwi/Taiwhenua and Haurora Providers will very likely activate their own response to the crisis.

Community halls, facilities and homes may also be opened to vulnerable people. It is likely the spontaneous community-led and tangata whenua response forms to address the immediate needs of the community before official assistance from responding agencies can arrive.

- **Ordered mass-evacuation will not automatically occur.**

There will not be an automatic ordered evacuation of a large part of the general population from affected areas (excluding Emergency Mobile Alerts encouraging the public to evacuate tsunami evacuation zones). Any ordered evacuation that does occur will be covered by the National Action Plan and will be planned for and facilitated in partnership with affected CDEM Groups.

Note: Ordered mass-evacuation is independent of immediate self-evacuation for life safety (e.g. responding to a long or strong earthquake) which may be informed by Emergency Mobile Alerts (where power and telecommunication networks allow).

- **There will be significant and long-term environmental impacts.**

Fuel, chemicals and hazardous materials (e.g. human waste, milk waste) may be leaked during the earthquake and/or tsunami, leading to environmental damage but also health and safety risks for responding agencies.

A large amount of debris, e.g. building facades, harmful materials-asbestos, soil and rock, will be generated by this event, altering and in some cases harming the environment. This debris may block transport routes reduce the mobility of responding agencies.

- **National and regional assembly areas will be established in accordance with national and regional plans.**

The NCMC will direct Regional Assembly and Staging Areas (Air and Sea) to be established to enable the storage, organisation and mobilisation of resources required by the response. The locations to be used will be assessed for damage following initial and follow-on impacts

- **Offers of international assistance will be made and coordinated through the NCMC.**

Offers of or requests for international assistance will result from this event. These will be managed by MCDEM and considered by the National Security Committee of Cabinet (NSC), via the Officials Committee for Domestic and External Security Coordination (ODESC) system

Appendix 2 – Core objectives and agency responsibilities

Activity	Core objective	Agency responsibilities	
Phase one – Immediate response activities			
Alerts and notifications	<i>To ensure responding agencies within the region are alerted to issues relating to the event</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Ensure that regional warning system is utilised where possible to keep all responding agencies informed. Implement alternate alerting methods where regional warning system is not able to be used.
		All other Agencies	<ul style="list-style-type: none"> Ensure that alerts and notifications are disseminated to all key staff
Warning and Informing the public	<i>To ensure timely provision of key emergency information to people impacted by the event</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Coordinate the provision of emergency information to the community across all available platforms
		All other Agencies	<ul style="list-style-type: none"> Ensure key emergency information is provided to the community in coordination with the Tairāwhiti CDEM PIM Function
Self-evacuation and Life Safety	<i>To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Provide clear direction with regards to safe zone locations and evacuation routes
		NZ Police	<ul style="list-style-type: none"> Direct people to evacuate from areas at risk of inundation Support traffic management where safe to do so
		Fire and Emergency NZ	<ul style="list-style-type: none"> Coordinate USAR activities in impacted areas as the situation allows
		St John Ambulance	<ul style="list-style-type: none"> Provide medical assistance to those impacted by the event as the situation allows Support FENZ with USAR activities by providing medical assistance Transport injured persons to healthcare facilities
		Hauora Tairāwhiti	<ul style="list-style-type: none"> Ensure capability to meet the medical needs of the impacted population
Response Activation and Mobilisation	<i>To activate appropriate response facilities to enable coordination of the response at all levels</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the GECC Support key staff to access the GECC facility as required
		Emergency Services	<ul style="list-style-type: none"> Activate the Base of Operations [REDACTED] and mobilise resources to respond

Establishing communications	<i>To establish appropriate communication to enable coordination of the response and information sharing between key agencies</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Ensure the operability of the Tairāwhiti CDEM Group DMR Network to support communication between responding agencies • Deploy radio and/or satellite communications to enable communication with the NCMC and the Emergency Services Base of Operations
		All other agencies	<ul style="list-style-type: none"> • Ensure operability of digital radio equipment to enable communication between the GECC and all responding agencies and internally with key response staff

Activity	Core objective	Agency responsibilities	
Phase two – initiating sustained response activities			
Providing Rapid Relief	<i>To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses) • Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event
		Welfare Providers	<ul style="list-style-type: none"> • Ensure provision of rapid relief services in support of the GECC
Developing Situational Awareness	<i>Develop a clear understanding of the impacts of the event as soon as possible to support decision making</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies • Lead the welfare impact assessment process • Conduct building damage assessments • Conduct utility damage assessments
		Fire and Emergency NZ	<ul style="list-style-type: none"> • Lead the rapid impact assessment process and coordinate the collection of information by other emergency services • Provide regular status reports to the Tairāwhiti CDEM GECC
		NZ Police	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
		St. John Ambulance	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
		Hauora Tairāwhiti	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC

		Welfare agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process • Provide regular status reports to the Tairāwhiti CDEM GECC
		Lifeline Utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments • Provide regular status reports to the Tairāwhiti CDEM GECC
Managed evacuation and exclusion	<i>To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police
		NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by Tairāwhiti CDEM Group • Establish cordons and exclusion zones
Operational Planning	<i>To ensure a coordinated response through a consolidate planning process across all responding agencies</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the Tairāwhiti CDEM Group Action Plan
		All other agencies	<ul style="list-style-type: none"> • Contribute to the development of the action plan by identifying key tasks, issues and resource requirements
Management of resources	<i>To ensure the most effective use of all available resources in response activities</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise available response resources • Identify any critical resource needs and request from the NCMC if not available within the region
		All other agencies	<ul style="list-style-type: none"> • Identify all available and critical response resources and provide to the Tairāwhiti GECC

Activity	Core objective	Agency responsibilities	
Phase three – sustained response activities			
Coordinated welfare delivery	<i>To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event • Ensure critical resources required to provide for on-going needs are prioritised
		Welfare agencies	<ul style="list-style-type: none"> • Support the provision of on-going needs as requested by the Tairāwhiti CDEM Group • Identify any critical resource needs to enable the delivery of key welfare services
Restoration of essential lifeline services	<i>Restore basic services to the community to the maximum possible extent</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise the restoration of lifeline services
		Lifeline Utilities	<ul style="list-style-type: none"> • Undertake the restoration of basic services to the community where possible to do so

Supporting community response and engagement	<i>Enable the community to lead response where appropriate through the provision of resources and advice</i>	Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Lead community engagement and provide supplies and resources to sustain community response efforts
		All other agencies	<ul style="list-style-type: none"> • Support community response efforts through provision of information, advice and resources
Debris management	<i>Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate the collection, removal and disposal of debris
		Tairāwhiti CDEM GECC	<ul style="list-style-type: none"> • Coordinate the collection, removal and disposal of debris

Appendix 3 – Hikurangi earthquake and tsunami draft event action plan

Event name:	AP Number:
Hikurangi Subduction earthquake and Tsunami	1
Operational period from:	Coordination facility:
	Tairāwhiti Group Emergency Coordination Centre
Operational period to:	Controller:

Summary of Incident / Event: (A summary of the hazard impacts, environment and response actions to date, including the most dangerous and most likely hazard scenarios. This is based on reconnaissance and status reports.)

- Mw 8.9 earthquake occurred on the Hikurangi subduction zone **at enter time and date here**. The earthquake was centred on **the central portion** of the Hikurangi subduction zone.
- A large tsunami was generated by the earthquake; the first wave arrived at Gisborne **Enter time of arrival here**; waves will continue for up to 24 hours. Large numbers of people have self-evacuated inland and to higher ground. An 'all clear' to return into the tsunami evacuation zone will not be issued until the risk of further inundation has abated.
- Impacts are not limited to Tairāwhiti, with damaging shaking experienced, and associated tsunami impacts across the North Island and top of South Island limiting the capacity of other CDEM Groups to support response in the worst hit areas.
- Ongoing aftershocks and associated tsunami continue-limiting the ability of emergency services to assist the trapped and injured within the tsunami evacuation zones.
- There is a large amount of isolation due to physical barriers and unavailable comms. This isolation applies to communities, resources and emergency services.
- The impact to engineering lifelines and transport nodes/links has been severe. There is limited communication, electricity and potable water.
- Many persons are displaced overwhelming the capacity of welfare systems to cope. These people have urgent and unmet needs such as food, water, shelter and clothing.
- The DHB is overwhelmed with the amount of injuries presenting at primary and secondary health centres. Medical supplies are limited, and generators will be required to continue operating.
- This event is unprecedented, provision of life safety advice and reassurance is paramount to maintaining public order and saving lives as secondary hazards continue.

Mission: (Mission Statement.)

To ensure a coordinated and timely response to minimise loss of life and prevent escalation of suffering.

Intent: (Give the intent, best stated as a concept, key tasks and end-state. It is a broad statement of what must happen and when.)

To provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles. This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- The public are protected from entering dangerous areas
- People's basic and immediate needs are met as quickly as possible
- People can access adequate medical assistance
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

The key priorities for the response are:

- Conduct life safety activities
- Identify and source key resources needed for response
- Establish response coordination arrangements
- Ensure immediate needs of the population are met
- Provide the public with appropriate response information
- Gain situational awareness
- Prioritise and manage resources

Designated Tasks: (Specific tasks and timings for each agency under the plan.)

Tairāwhiti CDEM GECC

- Ensure that responding agencies are kept alerted and informed with regards to the event and its impacts
- Coordinate the provision of emergency information to the community to reassure and support response activities
- Establish the GECC and communications to support the sharing of information between responding agencies
- Support the displaced population through the coordination of rapid relief and emergency shelter
- Coordinate the collection and analysis of information to inform situational awareness across all responding agencies
- Coordinate the collection of welfare needs information
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons
- Coordinate the Group-wide response planning process
- Coordinate and manage the acquisition and prioritisation of response resources and emergency welfare resources
- Conduct lifeline utility damage assessments and establish temporary arrangements for water distribution
- Clear key routes within district to enable response activities to occur
- Respond to public health issues as situation allows

New Zealand Police

- Establish Base of Operations [REDACTED]
- Carry out evacuations of identified areas as requested by the Tairāwhiti CDEM GECC
- Establish and maintain access control measures into evacuated areas
- Maintain law and order
- Support rapid impact assessment process
- Support Fire and Emergencies New Zealand USAR activities
- Establish Inquiry and Disaster Victim Identification (DVI) process

Fire and Emergencies New Zealand

- Establish Base of Operations [REDACTED]
- Coordinate USAR activities in impacted areas as situation allows
- Establish rapid impact assessment process where safe to do so

St. John Ambulance and Tairāwhiti DHB

- Attend to urgent medical needs as situation allows
- Support Fire and Emergencies New Zealand USAR activities
- Activate all operable medical facilities to support management of casualties
- Establish temporary morgue facilities
- Support on-going medical needs of population

Welfare Agencies

- Support the provision of rapid relief to the impacted population
- Support the rapid impact assessment process and the collection of community impact information

Te Puni Kōkiri (national and regional offices)

- To work with other government agencies and CDEM Groups to facilitate and co-ordinate support to Māori who require assistance, and to engage with iwi, hapū, whānau, and Māori communities to ensure their needs are met.
- To coordinate links with Iwi organisations to Māori communities to provide key emergency information and status reports

Lifeline Utilities Agencies

- Ensure key routes are cleared and alternate routes established where access is no longer possible to support response activities
- Establish access to emergency power supplies and re-establish electricity network where possible to do so
- Establish temporary access to communications

Limiting Factors: (Matters that may or will limit options, timeframes, or outcomes.)

Matters that may or will limit options, timeframes and/or outcomes:

- Emergency services and USAR resources are limited
- Emergency Services are limited in their ability to carry out initial action plans in tsunami evacuation zones by the ongoing threat of tsunami
- Food and potable water supplies are limited within the Group
- Damage to the medical supply chain combined with a stretched health service (low staff numbers and high community demand) is leading to worsening health outcomes,
- Damage to power and telecommunication infrastructure is limiting the effectiveness of multi-agency coordination,
- Damage to transport infrastructure, e.g. from liquefaction or lateral spreading, is limiting the mobility of responding agencies around the region,
- Significant numbers of displaced people,
- The ability to sustain the immediate and basic needs of affected populations,
- Availability and ability of critical personnel to get to key areas e.g. engineers to certify use of assets & key medical staff to get to key medical facilities.

Coordination Measures: (Times, locations, boundaries, and other measures designed to coordinate the response.)

- The Group Emergency Coordination Centre is established at (add location here) and is operating 24/7
- The Emergency Services Base of Operations will be established [REDACTED]
- ESCC meetings are occurring via satellite phone [REDACTED] daily
- GECC IMT meetings are [REDACTED] daily
- Sitreps are released at [REDACTED]
- Status Reports are required from all agencies by [REDACTED]

Resource Needs: (Who will provide what and when they will do it – including: information, supply, personnel, equipment and transport.)

The Tairāwhiti CDEM Group requires assistance as soon as possible in the form of:

- Food, water, medical supplies and emergency shelter
- Fuel and generators
- NZDF and International Defence Forces support for logistics and operations (ships, helicopters, terminal operations teams, fuel delivery systems, water purification etc.)
- CDEM staff for GECC
- Surge support from the emergency services (incl. USAR and DVI specialists)
- Surge support from other responding agencies and organisations
- Medical staff and facilities
- Building and transport infrastructure assessors including technical experts for the detailed inspection of

- buildings and structures
- Assets to enable reconnaissance

Information Flow: (Who needs to know and who has information we need? May include key information requirements, or they may be attached.)

Information inputs:

- Warnings and alerts from NEMA / GNS (GeoNet)
- Situational awareness information gathered from rapid impact assessments, community and status reports
- NCMC Action Plan and situation reports
- Resource requests

All status reports to be sent [REDACTED]

Information outputs:

- Public information and alerts / warnings to responding agencies and public
- Situation reports
- Action Plan
- Resource requests to NCMC

-

Public Information Plan: (Outline of intended public information processes and outputs. This may be attached.)

Establish a regular schedule for the provision of warnings, life safety advice, information regarding the situation and reassurance regarding the response. Public communications will use consistent messaging guides where possible.

If standard telecommunications are not working, alternate means of communicating will need to be utilised.

Communications Plan: (Frequencies / purpose / coverage, role cell phone numbers communications schedule, etc..)

The Group ECC will utilise the DMR network (digital radio) to conduct communications with responding agencies

Where possible, this will be supplemented by satellite communications as available.

The Group satellite phone numbers are as follows:

[REDACTED]

[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	

Appendix 4: Prelim Phase Recommendations

The following recommendations relate to readiness and response activities which are best completed *before* a large Hikurangi event to enable the response. The recommendations are adapted from Volume II of the Hikurangi Response Planning Toolbox, where further details as to the considerations associated with event impacts can be found.

Social environment	
HRP Impact	Recommendations
Injured persons	<ul style="list-style-type: none"> <input type="checkbox"/> Plan for stretched or overwhelmed health services and expect disruption to core health services. <input type="checkbox"/> Develop contingencies and continuity plans where health services may need to be delivered without power, potable water and telecommunications
Fatalities	<ul style="list-style-type: none"> <input type="checkbox"/> Conduct appropriate mass fatality planning for the CDEM Group, identifying suitable transport, storage and burial arrangements to accommodate mass fatalities. Where applicable ensure alternate facilities are wired for, or have, generator capability and are in suitable locations (i.e. outside tsunami evacuation zones). <input type="checkbox"/> Establish/maintain links to cultural and Inter-Faith Groups to advise on mass fatality planning.
Displaced persons	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure CDC and volunteer staff are familiar with NZ Police reunification process. <input type="checkbox"/> Conduct a high-level options analysis and scoping for mass emergency shelter and accommodation following a large Hikurangi event to inform the amount of domestic/international assistance required e.g. green spaces, businesses, warehouses. <input type="checkbox"/> Consider safety and security arrangements required for mass emergency shelter and accommodation. <input type="checkbox"/> Utilise East Coast LAB Tsunami Hiko and Hikurangi Response Planning resources to encourage communities to; <ul style="list-style-type: none"> • Know their risk • Take preparedness actions, such as practising their tsunami evacuation route during Tsunami Hiko week, to encourage their resilience.
Displaced animals	<ul style="list-style-type: none"> <input type="checkbox"/> Provide training for response personnel who may be required to work around animals in a disaster (e.g. at pet friendly CDCs). <input type="checkbox"/> Plan for evacuees sheltering with pets and/or establishing pet friendly spaces at emergency shelter and accommodation areas. <input type="checkbox"/> Identify larger enclosures/options to accommodate large animals/farm stock if required
Demand on welfare services to meet basic needs	<ul style="list-style-type: none"> <input type="checkbox"/> Determine for a large Hikurangi event; <input type="checkbox"/> Estimated quantities of rapid disaster relief resources (Rapid Disaster Relief expanded on in HRP Volume II) <input type="checkbox"/> A methodology for triaging communities within the Group to receive domestic and/or international assistance, and, <input type="checkbox"/> Methods for delivering assistance to communities where there is likely to be limited accessibility. <input type="checkbox"/> Establish MOUs/pre-agreements and relationships with regional private enterprises for the requisition and distribution of basic resources following a large Hikurangi event where applicable e.g. emergency shelter, food, household goods, private fuel supplies for emergency services (e.g. construction company holdings), water tankers etc. <input type="checkbox"/> Obtain a regional picture of privately-owned fuel holdings to act as an alternate supply. <input type="checkbox"/> Investigate alternative WASH facilities where a failure of 3 waters occurs, e.g. Investigate use of surface water sites, aquifers, local dams, springs and reservoirs as alternate water supplies, <input type="checkbox"/> Scope alternative emergency shelter options within the Group. <i>Note: WREMO has recently undertaken a project investigating emergency shelter options for the Wellington Region.</i> <input type="checkbox"/> Safety and security plans and procedures required in terms of rationing critical resources in affected communities. <input type="checkbox"/> Consider how the operation of privately-owned 'spontaneous' hubs which provide basic needs are safely managed during response, e.g. supermarkets, clothing shops

Large demands on responding agency staff (incl. CDEM staff)	<ul style="list-style-type: none"> <input type="checkbox"/> Plan for overwhelmed and under-staffed responding agencies. <input type="checkbox"/> Where it is likely Group staff may have difficulty getting to ECC/EOCs, pre-define muster points so staff can be transported together using land or air assets available. <input type="checkbox"/> Pre-prepare PIM messaging to help manage expectations of responding agencies during response (Refer HRP Toolbox Volume II for further recommendations regarding PIM messaging)
Built environment	
HRP Impact	Recommendations
Damaged buildings	<ul style="list-style-type: none"> <input type="checkbox"/> Identify an alternate ECC location outside of tsunami evacuation/hazard areas. <input type="checkbox"/> Determine priorities for building assessment within the group and set up MOUs with building assessors to fast-track the process following a large Hikurangi event <input type="checkbox"/> Plan for a large demand on cordons (size and/or number) (Cordons expanded on in HRP Toolbox Volume II)
Damage to telecommunications	<ul style="list-style-type: none"> <input type="checkbox"/> Communicate alternate communications channels amongst regional responding agencies and scope alternate methods of getting information to communities (e.g. use of noticeboards/scheduled public meetings/strategically located alternate comms) <input type="checkbox"/> Create a database of responding agency alternate communications systems, satellite phone numbers, radio frequencies and compatibility of these systems <input type="checkbox"/> Test alternate communication systems regularly as part of readiness <input type="checkbox"/> Determine how to give the 'all clear' and other messages to communities who have evacuated following the initial earthquake and tsunami when power and comms are down (Public information management expanded on in HRP Toolbox Volume II) <input type="checkbox"/> Work with regional responding agencies and lifeline groups to predetermine and refine the Group resource and information requirements for a large Hikurangi event and communicate these to NEMA as a contingency in case of damaged telecommunications following the event <input type="checkbox"/> Work with lifelines groups to pre-determine regional lifeline restoration priorities for a large Hikurangi event. Work with other CDEM Groups and lifeline agencies where lifeline agencies cross CDEM boundaries to understand cross-boundary restoration priorities to enable efficient alignment of resources during a response.
Damage to power networks	<ul style="list-style-type: none"> <input type="checkbox"/> Plan to initially respond without power and identify the regional interdependencies relevant to this impact, e.g. The reliance of telecommunications, water treatment plants, pumps (for water and fuel) on electricity or a form of power (e.g. fuel-powered generators), to function <input type="checkbox"/> Ensure coordination centres (including alternate ECCs) have hardcopy backups of templates, manuals and procedures <input type="checkbox"/> Ensure essential regional coordination facilities have, or are wired for, back-up power generators to enable coordination to continue without power. <input type="checkbox"/> As electronic banking is likely to be impacted, expect an increase in the amount of welfare and financial support required by communities
Damage to three water networks	<ul style="list-style-type: none"> <input type="checkbox"/> As part of rapid disaster relief, consider how to provide potable water to communities during response (See HRP Toolbox Volume II).
Damage to coordination and health facilities	<ul style="list-style-type: none"> <input type="checkbox"/> Prioritise critical regional response facilities for building inspections immediately following the event. <input type="checkbox"/> Decide and communicate alternate coordination facilities and/or locations between responding agencies. <input type="checkbox"/> Communicate to responding agencies the requirement to remove assets and staff that reside in tsunami evacuation zones to higher ground/inland where possible following a Long or Strong earthquake, and for response staff to wait to receive the 'all clear' from CDEM before re-entering tsunami evacuation zones.
Damage to transport infrastructure e.g. roading, ports and airports.	<ul style="list-style-type: none"> <input type="checkbox"/> Pre-identify priority transport routes for repair/debris clearance within the region to enable emergency operations. <input type="checkbox"/> Plan for a disrupted supply chain including medical supplies, fuel, household goods and groceries. <input type="checkbox"/> Identify communities likely to be isolated by this event and build resilience within them as part of readiness.

	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure volunteer staff are familiar with the location of ECC and EOC facilities within the CDEM Group, and those closest to their home in case they are isolated during the event from their 'usual' EOC/ECC. <input type="checkbox"/> Document private airstrips in the region which could be utilised in response (talk to local pilots to map).
Natural environment	
HRP Impact	Recommendations
Secondary and ongoing hazards	<ul style="list-style-type: none"> <input type="checkbox"/> Create aerial reconnaissance plans based on pre-determined information priorities. <input type="checkbox"/> Develop capability for the management of national and regionally coordinated aerial reconnaissance within Group (e.g. an air asset management plan/ air ops coordinator to coordinate with air traffic control tower). <input type="checkbox"/> Consider the H&S risks of response staff working in tsunami and hazard and earthquake damage zones (Refer HRP Toolbox Volume II, Risk Register) <input type="checkbox"/> Consider secondary and ongoing hazards which will slow/impede/complicate the response. <input type="checkbox"/> Support mental health messaging related to disasters as part of readiness, response and recovery.
Disaster debris and waste	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure Group disaster waste management arrangements are in place and incorporated in regional response planning as part of readiness (Suggest using the New Zealand disaster Waste Management Planning Tool' (2018)). Consideration needs to be given to the following in the context of collection, transport, stockpiling and disposal of waste: <ul style="list-style-type: none"> • The respiratory effects of dried silt from liquefaction • The ability of tsunami to widely spread contaminants • Damp living conditions due to liquefaction and tsunami inundation <ul style="list-style-type: none"> ◦ Sheltering in place in damp conditions could lead to worsening health outcomes • Damaged buildings linked to fatalities <ul style="list-style-type: none"> ◦ These buildings will require special treatment for the Coronial process • Buildings containing hazardous materials such as chemicals or asbestos • Disposal of material and H&S of emergency services entering buildings where this has been disturbed.
Damage to waterways and marine environments	<ul style="list-style-type: none"> <input type="checkbox"/> Consider how regionally stored contaminants could pose a threat to life safety if released into the environment, <input type="checkbox"/> Determine how the environmental response will be prioritised across the response phases.
Economic environment	
HRP Impact	Recommendations
<ul style="list-style-type: none"> • Damage to cultivation land • Damage to Central Business Districts (CBDs) • Disruption to business operations • Disruption to Tourism • Individual livelihoods 	<ul style="list-style-type: none"> <input type="checkbox"/> Promote business continuity planning within agricultural sector <input type="checkbox"/> Investigate likely impacted areas and estimated loss to the regional economy <input type="checkbox"/> Expect and plan for high requirement for financial assistance from employers and employees affected by the event. <input type="checkbox"/> Ensure businesses are engaged early on when planning for economic recovery following response <input type="checkbox"/> Plan to for an increased demand on welfare and financial assistance services in impacted areas.
Loss of regional connections for distribution	<ul style="list-style-type: none"> <input type="checkbox"/> Plan for a disrupted supply chain and identify alternative transport options/paths for goods and services to be delivered into the CDEM Group.

Appendix 5: Supporting diagrams

The following diagrams are based on the credible planning scenario and support the response concepts included this paper and in Volume II of the Hikurangi Response Planning toolbox. Please note the following diagrams are ‘examples’ only and are based on the credible planning scenario. They do not reflect planned response arrangements between the five CDEM Groups (Bay of Plenty, Tairāwhiti, Hawke’s Bay, Manawatū-Whanganui and Wellington) and estimated lifeline impacts require further refinement as part of regional response planning.

Figure 1: Inter-regional support (overleaf)

Following a large Hikurangi event it is likely some CDEM Groups may not have the capacity or capability to coordinate the response in one or more of their communities, requiring another CDEM Group with the capability and capacity to help by coordinating beyond its boundaries, for example, where a physical barrier, such as a landslide, may be isolating a community. Coordination across boundaries may also be necessary to achieve an effect, e.g. reconnaissance of an asset.

The decision for a CDEM Group to coordinate the response in a community beyond its boundaries would be a joint decision between the two CDEM Groups involved and would be in consultation with the National Controller and appropriate stakeholders.

Additionally, it is important to note some agency boundaries, such as NZ Police and Fire and Emergency NZ (FENZ) regions, do not align to regional council boundaries. Engagement and response planning with these agencies therefore requires a coordinated approach between the CDEM Groups and the agencies involved.

The requirement for national CDEM support and coordination should be identified and planned for where regions do not have the capability or capacity to meet response requirements themselves, or with direct coordination with adjacent regions.

Figure 2: Response Islands (overleaf)

This figure demonstrates the ‘response island’ concept at a regional scale, adapted from the Wellington Region Earthquake Plan (WREP). Please refer to the WREP for further information about response islands specifically in a Wellington context.

Following the credible scenario, landslides and/or damage to roading infrastructure is anticipated to isolate Tairāwhiti, Hawke’s Bay and Wellington regions, effectively creating ‘response islands’.

Until inter-regional road connections are restored, these regions will need to use alternate means (e.g. ships/planes) to fly people and resources into and out of the region.

Figure 3: Lifeline impacts – utilities (overleaf)

The figure below shows the estimated availability of lifeline utilities within the first seven days following the credible scenario. In the worst affected CDEM Groups, it is likely there will be no power, telecommunications, wastewater or potable water available within the first seven days following the credible scenario. It is important regional response planning plans for a response where these services are not available for a prolonged period of time.

Figure 4: Lifeline impacts – transport infrastructure (overleaf)

The figure overleaf shows the estimated damage and restoration times for transport infrastructure following the credible scenario. As shown in the figure, a large Hikurangi event could significantly affect inter-regional road connections, regional airports and ports. Significant damage or loss of this critical infrastructure would affect the way CDEM Groups respond to a large Hikurangi event and should therefore be considered as part of regional response planning.

Figure 1: Inter-regional support

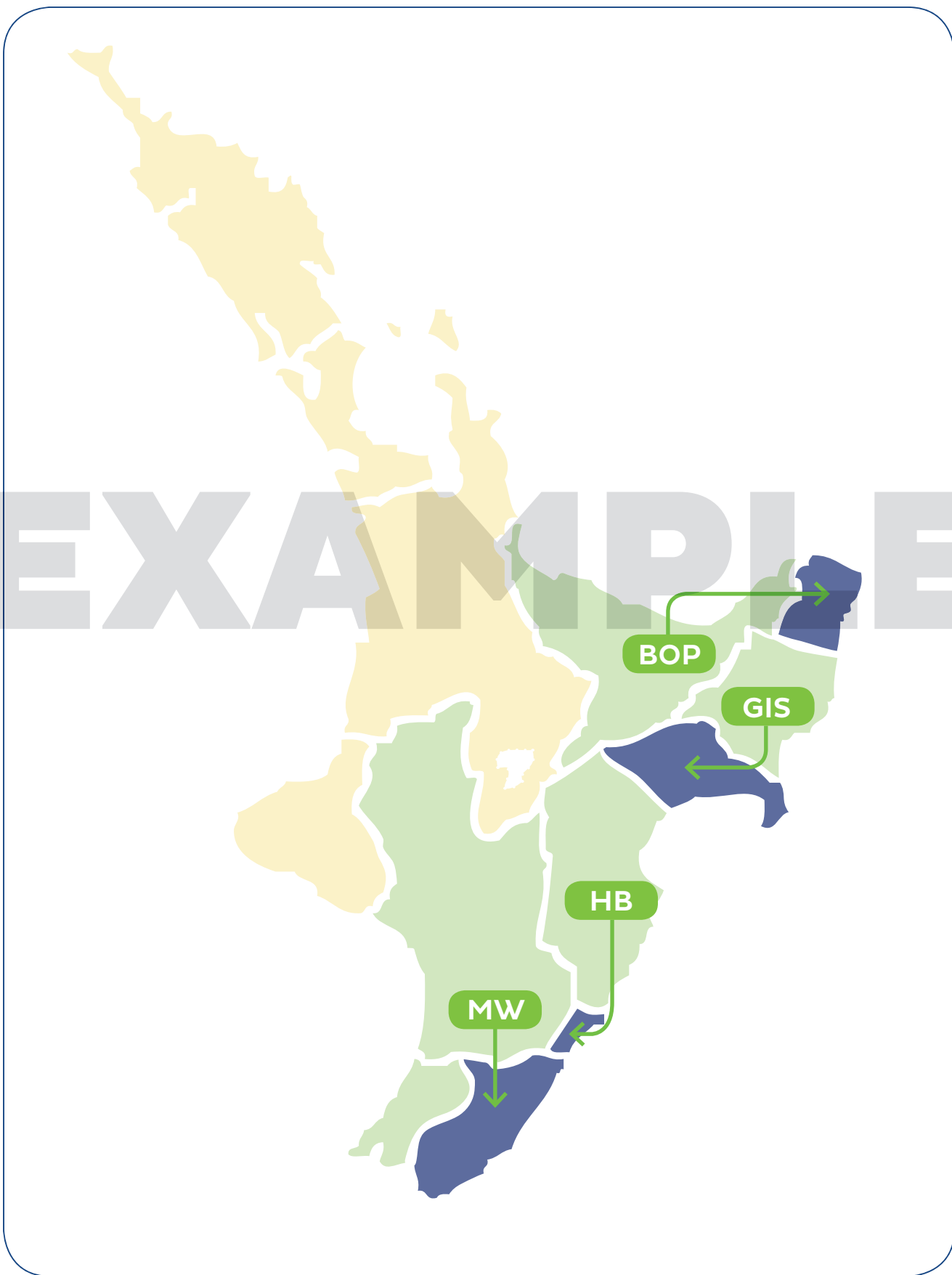
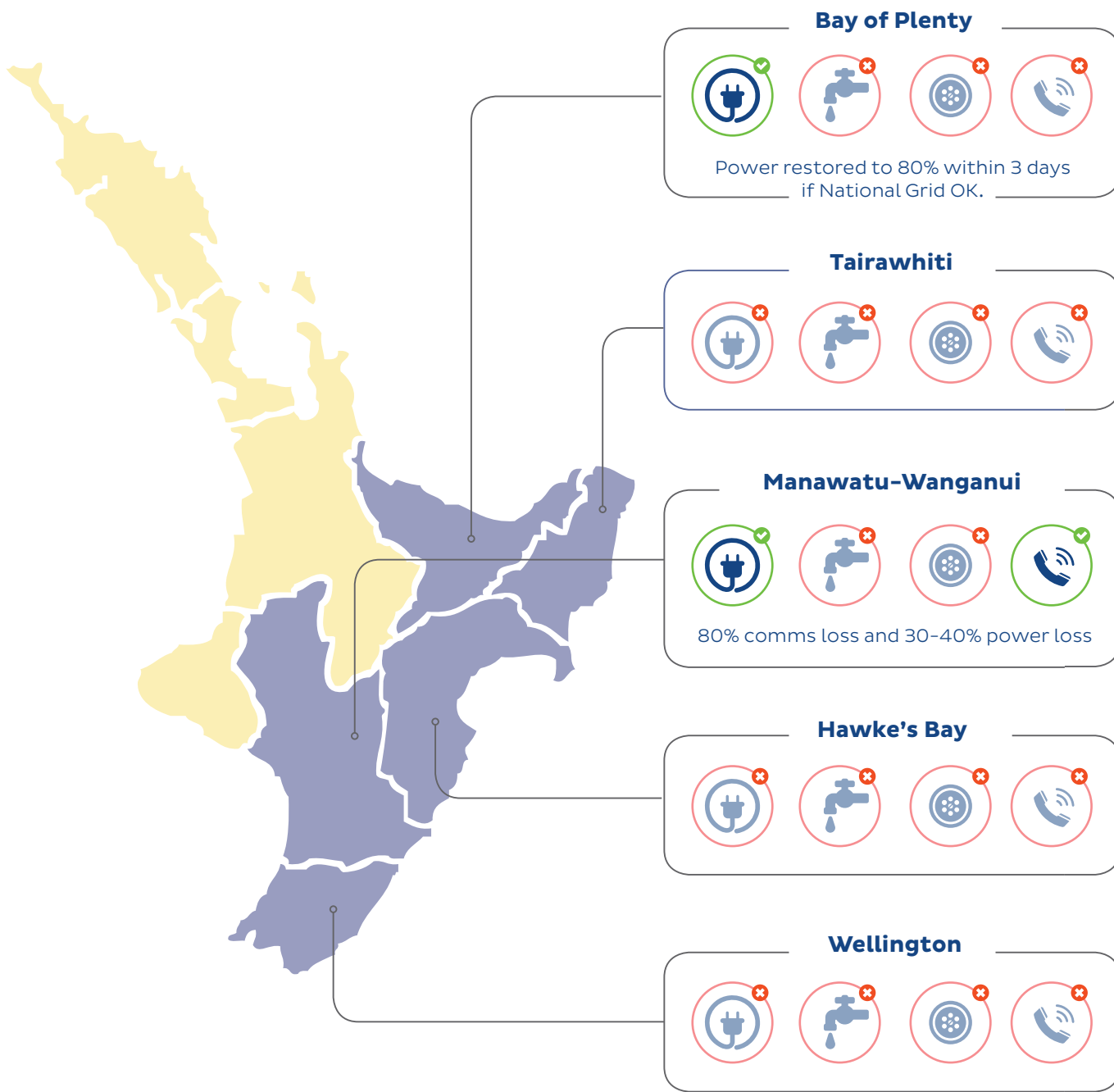


Figure 2: The 'island' concept



Figure 3: Example of lifeline utility availability in first seven days following credible scenario



KEY



Power



Potable water

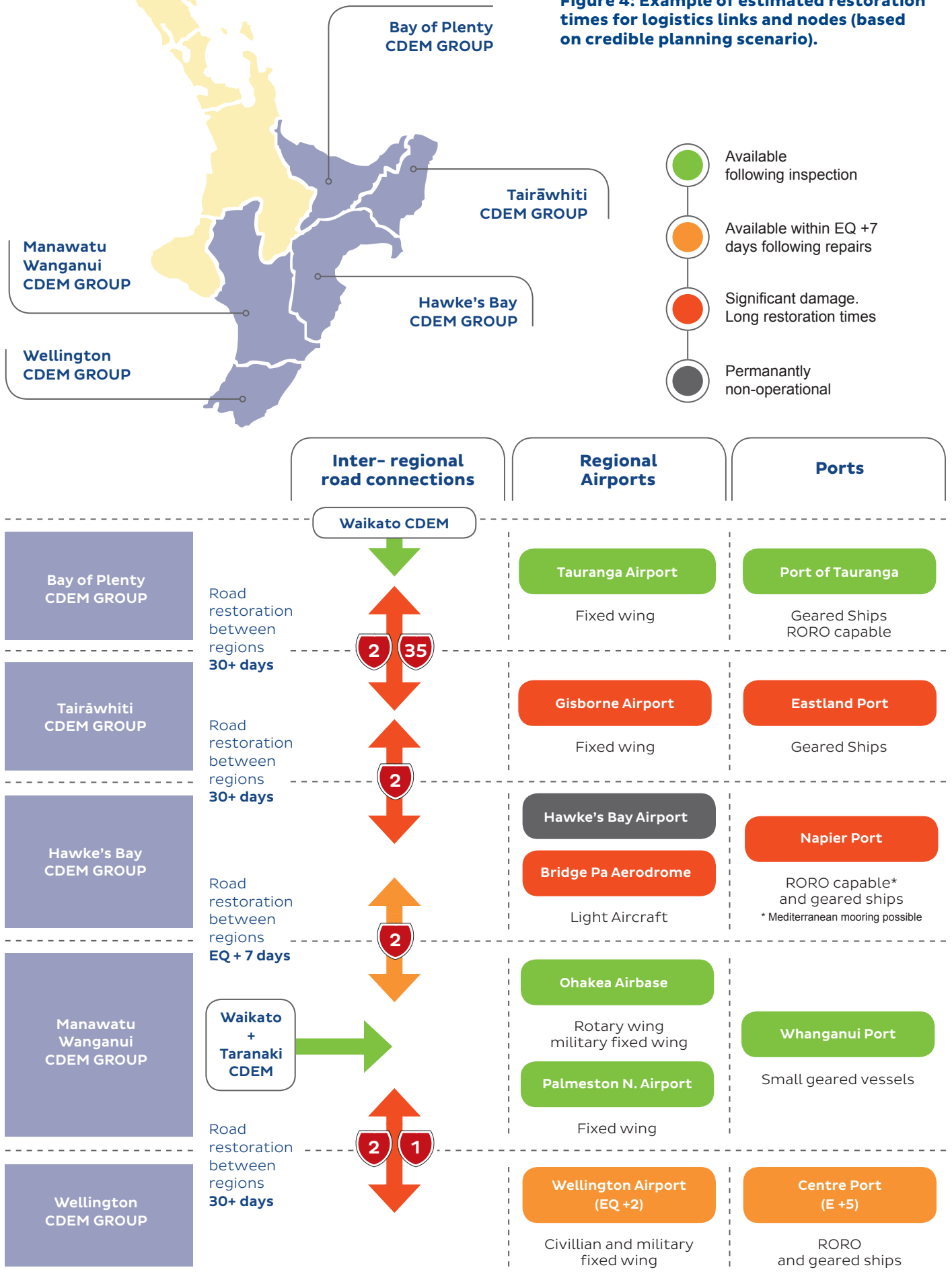


Waste water



Telecommunications

Figure 4: Example of estimated restoration times for logistics links and nodes (based on credible planning scenario).



- Available following inspection
- Available within EQ +7 days following repairs
- Significant damage. Long restoration times
- Permanently non-operational



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

HAWKE'S BAY CDEM GROUP

Hikurangi Subduction Zone Response Concept Paper 2020

Prepared by
East Coast Life at the Boundary (ECLAB)

Approved by:

Control Copy no:



HAWKE'S BAY
EMERGENCY MANAGEMENT

GROUP

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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 1

INTRODUCTION



HAWKE'S BAY
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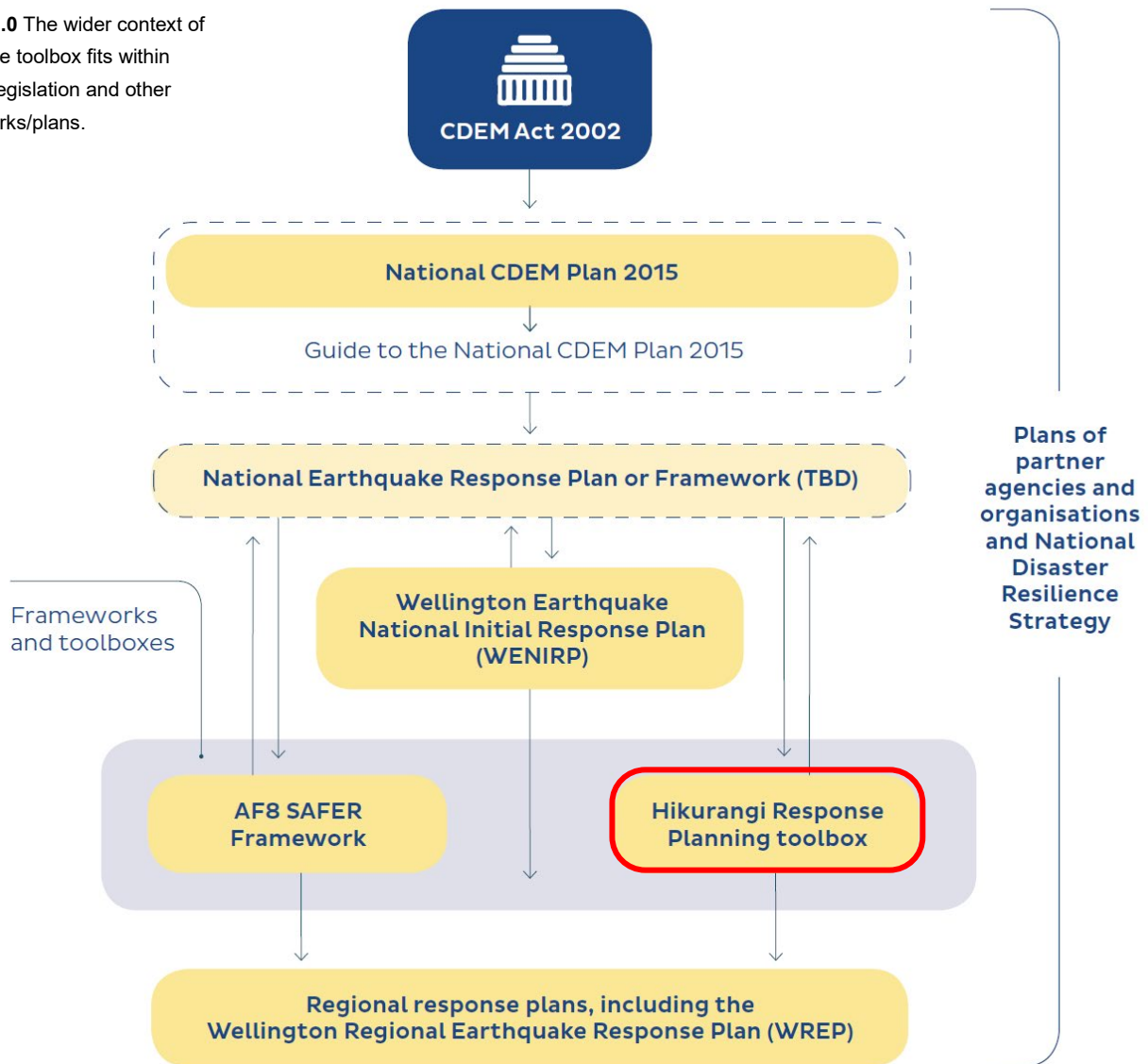
GROUP

1.0

Purpose of the document

The purpose of this document is to outline proposed response arrangements within the Hawke's Bay region to guide the response to a large earthquake and tsunami generated from the Hikurangi Subduction Zone in advance of any planning under a national earthquake and tsunami framework (TBD). This 'Regional Response Concept Paper' intends to provide a basis and starting point for regional response planning for a large Hikurangi event and fits within the Hikurangi Response Planning toolbox as pictured below.

Figure 1.0 The wider context of where the toolbox fits within current legislation and other frameworks/plans.



1.1

Scope

This concept paper is designed to be a guide for the Hawke's Bay CDEM Group response to a large earthquake and tsunami. It has used a credible magnitude 8.9 earthquake and tsunami planning scenario as a tool to aid planning (See Hikurangi Response Planning Toolbox Volume I, Appendix A). While many of the arrangements in this plan may be applicable to a range of events, there may be some requirement to modify or develop new arrangements for some events.

1.2

Legislative arrangements

The initiation of any response will be supported by several key pieces of New Zealand legislation:

- Civil Defence and Emergency Management Act 2002
- Health and Safety in the Workplace Act 2017
- Fire and Emergencies Act 2017
- Police Act 2008.

1.3

Supporting plans and documents

This paper is reliant upon other plans to be enacted in support. This includes arrangements for coordination, evacuation, welfare provision and lifeline utilities. The following plans should be used to support the implementation of this response plan:

- Hawke's Bay CDEM Group Response Framework
- Hawke's Bay CDEM Group Initial Response Plan
- Hawke's Bay CDEM Group Welfare Plan
- Proposed National Earthquake and Tsunami Response Framework.

1.4

Audience

This plan is intended to provide response guidance to the following audience:

- Hawke's Bay local Authorities, namely:
 - Hastings District Council
 - Napier City Council
 - Wairoa District Council
 - Central Hawke's Bay District Council
 - Hawke's Bay Regional Council
- The Emergency Services
- Hawke's Bay District Health Board
- Regional Welfare providers
- Government agencies including; New Zealand Transport Agency, Ministry of Business, Innovation and Employment (MBIE), Ministry of Primary Industries (MPI), Department of Corrections
- Lifeline utility providers
- Ngati Kahungunu and other Tangata Whenua (Including post-settlement Groups).

1.5

Review

This concept paper will inform the proposed National Emergency Management Agency National Earthquake and Tsunami Response Framework. Nevertheless, depending on national framework progress this paper may be reviewed every five years, or as necessary, should any information regarding the implementation of any aspects of the response contained within change.

1.6

Exercising

This document will be exercised as part of the review process to ensure that the arrangements contained can be effectively implemented as required.

1.7

Response assumptions

In order to enable effective planning several assumptions have been made regarding coordination of the event at a national level, availability of resources, the ability to respond and the activities of the community. The core assumptions regarding this event are listed below. A more detailed description of these assumptions is shown in Appendix 1.

- The process of declaring local states of emergency will be initiated immediately.
- A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.
- CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.
- The National Crisis Management Centre will be activated (in Wellington or Auckland) but will be initially operating at a reduced level.
- Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.
- Local Government within the North and South Island will continue to operate but with reduced capacity and capability.
- Responding agencies will be functional but operating with reduced capacity and capability.
- Secondary hazards, including tsunamis, will occur throughout the response affecting response and recovery.
- Standard communications will be limited and so where available, alternate communications will be used.
- Lifeline utilities will be limited or unavailable in the worst affected CDEM Groups.
- Movement corridors will be affected, and many roads will be unusable.
- Rail will be inoperable within the five CDEM Groups.
- Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.
- Ports will be impacted by the earthquake and tsunami.
- Health and welfare services will be initially overwhelmed.
- Communities will be isolated.
- Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.
- Depending on the time of day significant numbers will be displaced from their home locations.
- The community led and Tangata Whenua response will work to meet communities immediate and basic needs where possible.
- Ordered mass-evacuation will not automatically occur.
- There will be significant and long-term environmental impacts.
- National and regional assembly areas will be established in accordance with national and regional plans.
- Offers of international assistance will be made and coordinated through the NCMC.



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SECTION 2

REGIONAL CONTEXT



HAWKE'S BAY
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2.0 Regional overview

Population

The region of Hawke’s Bay is located on the east coast of New Zealand’s North Island. The region has four main centres of population: Napier, Hastings, Waipukurau and Wairoa. The region has a population of approximately 166,368 (*NZ Census data 2018*) with around 44% living within 6km’s of the coast.

The night-time populations for areas within the tsunami evacuation zones are:

District	Night-time population within tsunami evacuation zones (estimated)
Central Hawke’s Bay	603
Hastings	9,492
Napier City	49,860
Wairoa	6291

Approximately 22% of the population is aged under 14 years of age. 12% of the population in Hawke’s Bay is aged 70 or more.

Local Government

The region has four territorial authorities and one regional authority: Wairoa District, Napier City, Hastings District, Central Hawke’s Bay District and Hawke’s Bay Regional Council.

Economy

The primary industries within the region are manufacturing and agriculture, which make up almost 25% of the regional GDP. Tourism also plays an important part in the regional economy, with Napier providing the majority of hotel and motel accommodation.

Lifelines

The region is served by three state highways: SH2 connecting the region to Tairāwhiti in the north and Dannevirke (Manawatu) to the south, SH 5 connecting the region to Waikato in the east and SH50 connecting the region to Manawatu in the south.

In addition to road connectivity, the region has a major seaport, regional airport and rail links north and south.

Electricity is mainly supplied by high voltage lines from the central North Island (Taupo) and to the south of the region via Bunnythorpe. There is limited generating capacity at Lake Waikaremoana which can supply some power to the region. The most important power asset for Hawke’s Bay is the Redcliffe substation.

2.1 Planning scenario overview

A credible planning scenario, developed by GNS Science (**see Power et al., 2018**), has been used as a tool to develop the HRP Toolbox and this Regional Response Annex. A high-level overview of the scenario is provided in the sections below. For the full scenario, please refer to Appendix A within Volume I of the HRP Toolbox.

The earthquake

The planning scenario starts with a magnitude 8.9 earthquake on the southern portion of the Hikurangi Subduction zone. This is a realistic large earthquake that would impact most of the subduction zone and is slightly lower than the maximum plausible magnitude of Mw 9.0. Shaking in the Hawke’s Bay region would be extremely severe, between 8 and 10 on the modified Mercalli scale and lasting for over a minute. Liquefaction across the region would also be severe as a result of the shaking. Subsidence (1.5m) of land around the airport and Onekawa is also modelled to occur as a result of the earthquake.

Offshore the quake would cause widespread uplift of the seafloor right out the trench of around 2 – 2.5m. This uplift would result in the creation of a series of tsunami.

It is likely that significant aftershocks would continue for many weeks and months after the initial event, with some aftershocks exceeding Mw 7.0 and possible requiring sustainment of exclusion zones or further evacuations of the population.

The tsunami

The earthquake would create a series of tsunami waves with average run up heights of 7 – 10 metres and exceeding 20 metres in some localised areas. Offshore waves exceed 5m in height. Inundation along the Hawke’s Bay coast would be extensive, with flow depths of over 5 metres near

to the coast but averaging 1 – 2.5 metres across the majority of coastal areas (Figure 2.0).

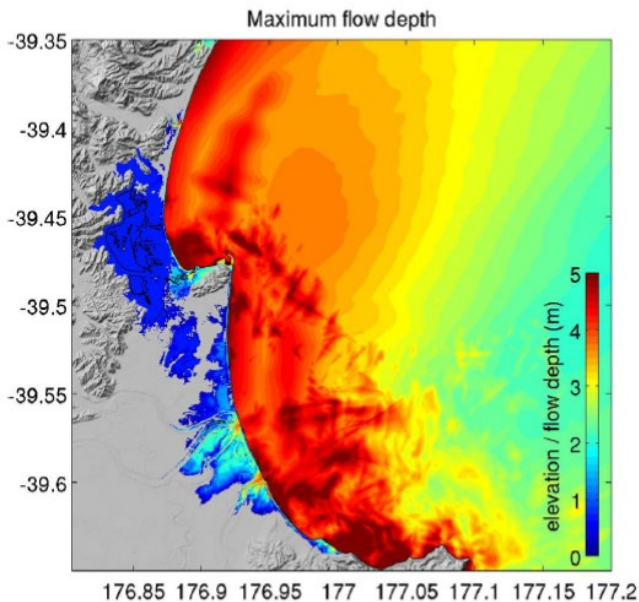


Figure 2.0: Modelled inundation flow depths for Napier and Hastings (Power et al., 2018).

The first wave would be expected to impact the region within 20 minutes of the earthquake occurring. Wave heights would peak around 30 – 50 minutes. A second wave, which would be more severe to the south of Napier, would be expected to peak around 140 – 160 minutes after the quake (approx. 2.5hrs).

The impacts

Population

Widespread evacuation of coastal areas would occur inland and to areas of high ground. Liquefaction and infrastructure damage would make it difficult for some areas to easily evacuate post-quake. The impacts of a Hikurangi earthquake and tsunami event would be catastrophic for the population of Hawke’s Bay. It is estimated that there could be hundreds of fatalities and thousands of injuries. Many thousands of people would be unable to return to their homes throughout Hawke’s Bay with many more only having access to basic shelter and no access to utilities.

Built environment

Widespread liquefaction across the region would result in damaged roads and infrastructure. There would be widespread tilting of buildings on their foundations and some building collapse within the Napier CBD and moderate damage to other buildings within the region as a result of the earthquake.

In addition, the tsunami would cause severe damage to residential areas along the coast, in particular the areas of Te Awanga, Haumoana, Clive, Ahuriri and Westshore. Other coastal areas would experience moderate to minor damage from the inundation. Widespread debris and pollution within urban areas is likely to occur, complicating immediate clean-up, opening of roads and restoration of lifeline services.

The state highway network would be impacted by both the earthquake and the tsunami, with landslides, bridge damage and tsunami debris causing the region to be cut off by road. The rail network within the region would be severely damaged and would need many weeks to be repaired.

The Napier Port would be inoperable due to extensive damage from the tsunami. No vessels would be able to enter the port, meaning there would be limited supply of fuel and other goods coming into the region. In addition, the Ahuriri Fuel storage tanks are likely to be affected, leaving road as the only possible method of mass fuel resupply. There is likely to be significant debris left floating around the Port after the event, including large items like boats, logs and containers. These will pose significant maritime hazards as long as they remain floating in the harbour. These navigation hazards are likely to significantly impact the ability of any maritime response, for example, operations may only occur during daylight hours or vessel escort is required. Even after the Port is re-operationalised, floating debris may have the implication that vessels cannot enter the Port safely.

The Napier Airport would be unusable due to the subsidence and liquefaction. The airport would likely flood with every high tide, so would be out of operation permanently. Other smaller airfields within the region would be useable (e.g. Bridge Pa Aerodrome).

Electricity, water and sewerage have all been extensively damaged as a result of the quake requiring weeks to repair. Telecommunications would be mostly unusable.

Alternative Scenarios

Several other scenarios were modelled to show the potential impacts to the region. These are shown in the GNS Science report. They included modelling a rupture of the fault further north from the above scenario, varying the slip distribution and a scenario focussing on a rupture in the area of strong coupling to the south of the Hikurangi zone.

In all the alternative scenarios Hawke's Bay is still significantly impacted by both the earthquake and the tsunami. Therefore, the measures contained within this plan should be suitable for a range of events that could potentially occur from a Hikurangi Subduction Zone event.

Scalability

Please note that the response activities and objectives contained within this plan are designed to be scalable to a range of Hikurangi earthquake and tsunami scenarios for the Hawke's Bay CDEM Group, noting the planning scenario is only one of many possible scenarios which could occur on the Hikurangi subduction zone.



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HIKURANGI RESPONSE PLANNING

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SECTION 3

RESPONSE ARRANGEMENTS



HAWKE'S BAY
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3.0

Response arrangements

Initiation of response

The initiation of a response will be the result of a long or strong earthquake occurring. Initially it will be unknown if the earthquake is associated with the Hikurangi subduction zone and therefore if a tsunami has been created.

Group Controller's Intent

To immediately initiate a coordinated, timely response to minimise loss of life and prevent escalation of suffering. Provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles.

This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions.
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations.
- Information is readily shared between response organisations to improve situational awareness and decision making.

Limiting factors

The following factors may limit the Hawke's Bay CDEM Group's ability to implement the activities detailed within each of the response phases:

1. Estimated time of arrival for first wave

The first waves from a major Hikurangi event would be expected to arrive around 20 minutes after the earthquake occurs. This will leave minimal time for self-evacuation activities and no time for more formal evacuation arrangements to be implemented.

2. Liquefaction and subsidence

A result of the earthquake will be widespread liquefaction and subsidence. This will cause issues with access into and out of areas and may make some areas inaccessible for several days.

3. Resource availability

The impacts of the earthquake and tsunami may make resources scarce until supply lines can be established from outside the region. Lack of resources (perceived or real) may result in panic buying or looting.

4. Lifeline utility damage

Lifeline utilities will be extensively damaged as a result of the event adding complexity to the ability to carry out response activities and establish a coordinated response. Note also that many of the Lifeline agencies rely on the availability of contractors for response activities. Additionally, many agency and lifeline contractor equipment yards and offices are located within tsunami evacuation zones.

5. Continued risk of tsunami

The risk of tsunami will continue for up to 24hrs after the initial wave has impacted. There will also be risk of further tsunami with any significant aftershocks. This will prevent some response activities from occurring until safe access to an impacted area can be established. Regional land subsidence may result in increased risk of tsunami impact in the Hawke's Bay.

6. Continued risk of aftershocks

There will be a continued risk of large aftershocks occurring for many weeks and months after the initial event. These may cause further damage, result in the need for additional evacuations and potentially result in further tsunami events occurring.

7. Number of displaced persons

This event will result in thousands of people becoming displaced across several different locations, including response staff, which will significantly impact the ability to respond. Quick reconnaissance of where people have been displaced to will be required to ensure aid reaches all those in need.

3.1

Roles and responsibilities

Organisation	Role and responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Ensure coordination of the response across partner agencies and responding organisations
NZ Police	<ul style="list-style-type: none"> • Ensure public safety • Maintain law and order • Manage public movement • Lead Disaster Victim Identification (DVI) process, mass casualty teams, reporting deaths to the Coroner's office and provision of inquiry services for missing persons. • Lead the investigation of any large-scale fatalities to report on criminal responsibility (Please note this would not be a priority within the first 24hours) • Where mass fatalities occur as a result of a scenario which severely impacts the Hawke's Bay Region, NZ Police would be responsible for the establishment and management of mass fatality temporary morgue facilities on behalf of the Coroner. These internal Mass Fatality Morgue plans are already in place and were updated as a result of COVID-19. • Activate Business Continuity Plans
Fire and Emergency New Zealand	<ul style="list-style-type: none"> • Lead response to all fire and hazardous substance related issues, urban search and rescue activities and coordinate the rapid impact assessment process • Activate Business Continuity Plans
HB DHB	<ul style="list-style-type: none"> • Ensure provision of hospital and key health services within the region • Activate Business Continuity Plans • Public health in the areas of: <ul style="list-style-type: none"> ○ Water supply – ensuring safe drinking water is available ○ Sewage disposal ○ Refuse Collection ○ Infectious Disease Control e.g. caused by pathogens after a disaster ○ Emergency Shelter and housing ○ Personal Hygiene (Public Hygiene) ○ Hazardous Waste disposal / chemical spills ○ Vermin and vector control ○ Emergency sanitation (toilets, showers and disposal of wastes, supervision) ○ Disinfection (Advice, supervision). ○ Air quality – advice ○ Burials ○ Radioactive substances
St. John Ambulance	<ul style="list-style-type: none"> • Provide rapid response medical care as required and transportation of injured persons to health facilities. • Activate Business Continuity Plans
Local Authorities	<ul style="list-style-type: none"> • Ensure staff are trained to support response both regionally and locally.

	<ul style="list-style-type: none"> • Ensure provision of core services including key lifeline utilities. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
Welfare Agencies	<ul style="list-style-type: none"> • Ensure the provision of welfare services to persons impacted by the event as required. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
Lifeline Agencies	<ul style="list-style-type: none"> • Ensure the provision of core lifeline services to the region to the maximum possible extent. • Activate Business Continuity Plans
Iwi	<ul style="list-style-type: none"> • Provide cultural and communications advice regarding the response to Tangata Whenua within the region • Coordinate links to Māori communities to provide key emergency information and status reports • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level

3.2 Coordination arrangements

In the early stages of any response there will be difficulty coordinating the activities of responding agencies until an appropriate command and control structure can be implemented.

Response structure

The Hawke’s Bay CDEM Group will endeavour to establish the HB CDEM Group response structure shown in the HB CDEM Group Response Framework 2018. This structure is based upon regional coordination with centralised coordination and delivery of the welfare, planning and intelligence functions.

Establishing response facilities

It is highly likely that some key response facilities of core agencies will be heavily impacted by the event. The key response facilities that will be established as soon as practicable are listed below and can be seen in Figure 3.0.

Establishment of these facilities will be dependent upon accessibility, structural safety and access to key equipment, resources, and lifeline services such as emergency power.

Response Facility	Location
Group Emergency Coordination Centre (GECC)	311 Lyndon Road East, Hastings
Emergency Services Base of Operations	[REDACTED]
Wairoa District Council EOC	Wairoa Hospital, Wairoa
Central Hawke’s Bay District Council EOC	CHBDC Offices, Waipawa
Hawke’s Bay Regional Council EOC	Alternate* Location [REDACTED] [REDACTED] [REDACTED] [REDACTED]
Civil Defence Centres (As deemed appropriate based on impact)	[REDACTED] [REDACTED]

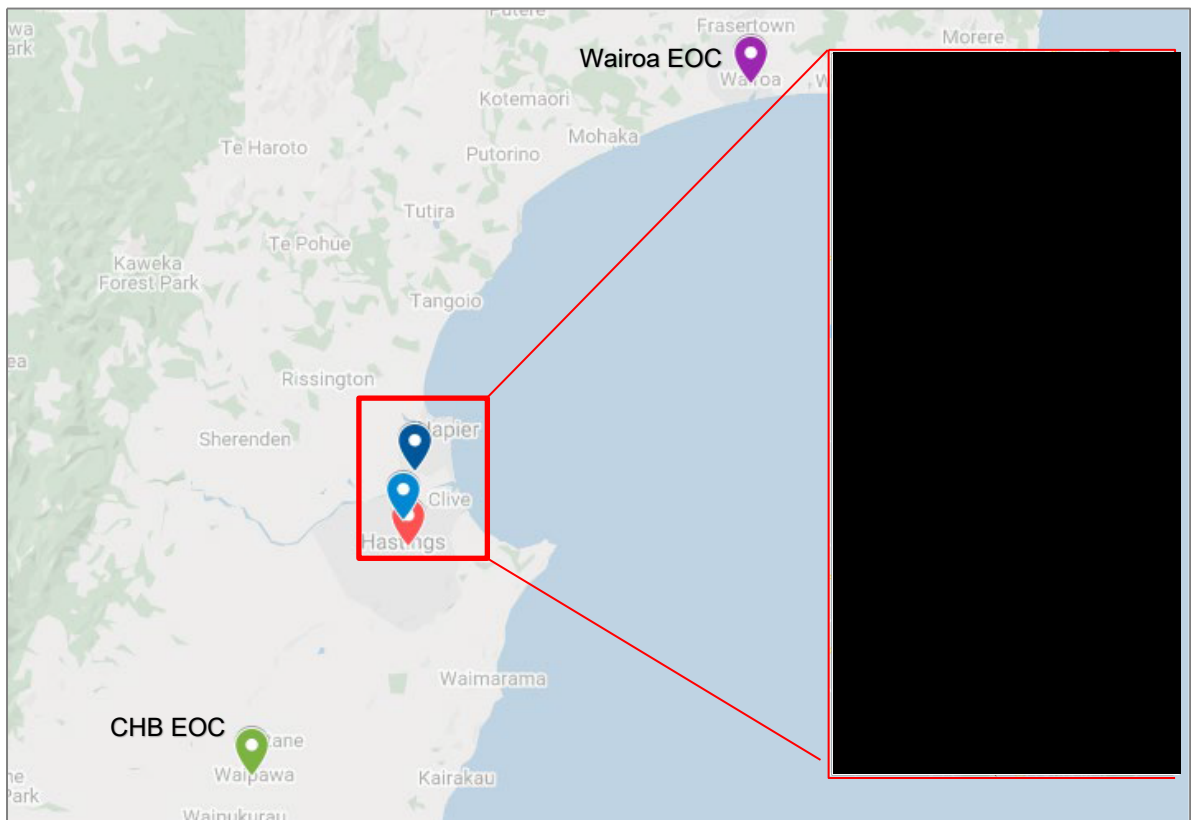


Figure 3.0: The location of response facilities in the Hawke’s Bay region

3.3

Response Phases

Three response phases have been used to describe the outcomes, actions and core response activities following a large Hikurangi event. The response phases cover:

- Phase 1 (Immediate response)

The immediate response, where emergency services are reacting to the earthquake and tsunami which has just occurred – this phase is dominated by activities which enable lifesaving and life preservation.

- Phase 2 (Initiation of sustained response)

The gap between the immediate, uncoordinated response and one that starts to become self-sustaining. During this phase, response agencies have interim operating capability.

- Phase 3 (Sustained response)

A self-sustaining response bolstered by domestic and/or international resources where required. All responding entities are at full operating capacity and capability

Event timeline

	Event	Outcomes/Actions	Core response activities
Phase 1	Earthquake occurs	<ul style="list-style-type: none"> • Mainshock causes extreme damage across the Hawke’s Bay region and wider East Coast of New Zealand including building collapse. • Coastal populations begin self-evacuating inland and to higher ground in un-coordinated fashion. • Some evacuation routes are severely damaged, and people are unable to easily move to safety. • Emergency Services direct people to evacuate whilst moving key assets to safe locations and inland and on Napier Hill. • Electronic national and regional warnings issued for tsunami, however due to lifeline damage from the mainshock, are not able to reach most of the Hawke’s Bay population. 	<ul style="list-style-type: none"> • Alerts and notifications • Warning and informing (Public) • Self-evacuation and life safety activities • Response activation and mobilisation • Establishing communications
	First tsunami reaches shore	<ul style="list-style-type: none"> • Severe liquefaction, landslides and lateral spreading across region. • Areas around Napier have subsided. • First tsunami wave has reached shore and inundation of low-lying areas has begun. • Population continuing to self-evacuate. 	
	Major inundation from first wave	<ul style="list-style-type: none"> • Major inundation from tsunami now occurring along coast of Hawke’s Bay. • Some of the population has been unable to move to safety, others are still in the process of evacuating. 	

		<ul style="list-style-type: none"> Major damage occurring to key infrastructure such as the port, state highways, rail and airport as a result of inundation in Napier CBD and across the region. 	
	Displaced population arriving in safe areas	<ul style="list-style-type: none"> Community unsure of what to do. Spontaneous first aid and assistance provided to evacuees by locals with resources at hand. Emergency Services carry out initial actions plans, responding to immediate needs of those in safe areas and triaging medical assistance. USAR and general rescue operations activities begin with in situ regional resources. Evacuation of status 1 casualties begins. Rapid impact assessments carried out in safe areas. Response staff in affected areas check on their families. Community-led response begins. 	
	HB CDEM Group activate response	<ul style="list-style-type: none"> Key staff alerted and begin travelling to the GECC where able. Emergency Services activate base of operations [REDACTED]. 	
	Basic communications established	<ul style="list-style-type: none"> Basic VHF communications is established between key agencies. Information gathering begins, however, there is limited situational awareness. 	
Phase 2	Delivery of rapid relief	<ul style="list-style-type: none"> Community efforts to provide rapid relief to displaced and impacted persons bolstered. Community halls, schools and sports facilities opened to provide shelter and basic needs. 	<ul style="list-style-type: none"> Providing Rapid Relief, Developing situational awareness, Managed evacuative and exclusion, Operational planning, Management of resources
	Tsunami activity subsides, aftershocks on-going	<ul style="list-style-type: none"> Rapid impact assessment undertaken in areas where inundation has occurred. Emergency Services begin responding to immediate needs of those within the areas impacted by tsunami who have survived. Ongoing aftershocks have the effect of pausing response activities, recommencing when risk of further tsunami assessed. 	
	Basic situational awareness gained	<ul style="list-style-type: none"> CDEM Initial action plan developed. Resources coordinated and deployed to priority areas. Evacuation of other casualties as required begins, and as transport is available. Identification of additional resource shortfalls and requests for support to NCMC begins. Coordinated impact assessment begins. 	
	Surge support arrives	<ul style="list-style-type: none"> Some international and domestic assistance starts to arrive but it is limited because of wide spread damage especially in North Island. Preparation of Regional Assembly Areas begin. USAR operations increase, with deployment of additional international teams into affected areas. 	

Phase 3	Delivery of rapid relief	<ul style="list-style-type: none"> • CDC's activated to meet basic needs of population. • Basic needs assessment process is conducted. 	<ul style="list-style-type: none"> • Coordinated welfare delivery, • Restoration of essential lifeline services, • Supporting community response and engagement, • Debris and Environmental Management
	Supply chains established	<ul style="list-style-type: none"> • Supply of essential goods into the region occurs via air to hubs in Bridge Pa, Waipukurau and Wairoa. • Supermarkets and spontaneous 'hubs' (e.g. general stores with household items such as clothes) controlled by CDEM to ensure supplies are managed. 	
	Basic lifeline utilities re-established in inland areas	<ul style="list-style-type: none"> • Electricity is available to some parts of the region. • Basic mobile phone connections are re-established inland. • Water supply is restored to some areas. 	
	Community response supported	<ul style="list-style-type: none"> • Community initiatives supported with resources. 	
	Sustained response activities occurring	<ul style="list-style-type: none"> • On-going welfare needs of the population are met including food supply and medium-term accommodation for displaced persons. • Lifelines are continuing to be restored in impacted areas. • Communication is improving. • Supply chains are improving, and increased resources are arriving to support the response. • Environmental clean-up occurring. 	

3.4 Phase one- immediate response activities

Phase 1 response priorities

The following priorities exist for Phase 1 of the response:

- Conduct life safety activities
- Protect key resources needed for response
- Establish response coordination arrangements

Alerts and notifications

The natural warning signs (A long OR strong earthquake) will be the main alert to a major event occurring for all agencies. Given the nature of the event it may not be possible for the HB CDEM Duty Manager to issue a regional warning via the regional warning system, however, they should still endeavour to do this from a safe location, as it may still be received by some.

In addition to this alert it is assumed that a national warning will have been issued via the Emergency Mobile Alerting system and that this has been received where there is still capability in the communications networks.

As the event progresses alerts may need to be issued via other methods such as VHF and satellite communications.

Core objective:

To ensure that responding agencies within the region are alerted to issues relating to the event

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Ensure that regional warning system is utilised where possible to keep all responding agencies informed. • Implement alternate alerting methods where regional warning system is not able to be used.
All other agencies	<ul style="list-style-type: none"> • Ensure that alerts and notifications are disseminated to all key staff

Warning and informing (Public)

Due to the nature of the event warning and informing the public may not be possible across many platforms.

In the early stages of the event (Immediately after the initial earthquake has occurred) there would be a reliance upon the population acting based on the long or strong messaging that is used to promote natural warning signs.

There may be limited phone signal as a result of the quake, but it must be assumed that a national warning would be put out using the Emergency Mobile Alerting platform and where the capability was still operational this could be received by anyone with a mobile phone.

As the event progresses other platforms for communicating with the public may start to become available with the restoration of communications, however, during Phase 1 and 2 of the response communications will be restricted.

The HB CDEM VHF network may still be operational following the quake and could be used in the first instance to communicate with impacted communities where radios exist. This will be reliant upon VHF radios in the communities being switched on and able to operate effectively.

Note: Many VHF radio units within the community are located in coastal communities that may be heavily impacted by the event

Core objective:

To ensure the timely provision of key emergency information to people impacted by the event

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of emergency information to the community across all available platforms
All other agencies	<ul style="list-style-type: none"> • Ensure key emergency information is provided to the community in coordination with the HBCDEM PIM Function

Self-evacuation and life safety activities

It is assumed that there will be mass self-evacuation from coastal areas following the earthquake and this will be strongly encouraged in any warnings that are issued. However, it is extremely likely that there will be severe congestion, and some may be unable to evacuate to safety in time due to damage as a result of the earthquake, or their distance from a safe area. All efforts should be made by responding agencies to assist people to evacuate while ensuring that critical staff and resources are evacuated to safety to support the response.

The preceding earthquake is likely to cause considerable damage within the region resulting in injuries and deaths. Initial focus for life safety activities should be directed towards those who have evacuated to a safe area or have been impacted by the event in areas away from the coast. Once it is safe to do so, and there is reduced risk to personnel and assets, the focus of life safety activities will move to those impacted by both the earthquake and the tsunami near to the coast.

Core objective:

To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Provide clear direction with regards to safe zone locations and evacuation routes
NZ Police	<ul style="list-style-type: none"> • Direct people to evacuate from areas at risk of inundation • Support traffic management where safe to do so
FENZ	<ul style="list-style-type: none"> • Coordinate USAR activities in impacted areas as the situation allows
St. John Ambulance	<ul style="list-style-type: none"> • Provide medical assistance to those impacted by the event as the situation allows • Support FENZ with USAR activities by providing medical assistance

	<ul style="list-style-type: none"> • Transport injured persons to healthcare facilities
HB DHB	<ul style="list-style-type: none"> • Ensure capability to meet the medical needs of the impacted population
Local Authorities	<ul style="list-style-type: none"> • Support evacuation of people from coastal areas

Response activation and mobilisation

In the initial phase of the event responding organisations will be utilising existing SOPs to respond accordingly. However, in order to ensure coordination across all agencies there will be a need to establish response facilities and mobilise personnel and resources to carry out key response activities.

The process of activation and mobilisation may be made extremely difficult by the lack of communications and accessibility of facilities. It is also highly likely that some staff and resources will have been lost due to their location at the onset of the event. In addition, severely damaged coordination facilities will require structural assessment by a suitably qualified building inspector before re-occupation.

Focus should be placed on ensuring the Group ECC is activated as soon as possible to provide a base for the coordination of the response. In addition, the emergency services should focus on establishing the Base of Operations [REDACTED] to manage the on-going life safety activities.

Core objective:

To activate appropriate response facilities to enable coordination of the response at all levels

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Utilise all systems available to mobilise response staff and activate the GECC

	<ul style="list-style-type: none"> Support key staff to access the GECC facility as required
Emergency services	<ul style="list-style-type: none"> Activate the Base of Operations [redacted] and mobilise resources to respond

Establishing communications

The ability to communicate between responding agencies and on the ground between responders is critical to enabling a coordinated and effective response to the impacts of the event. It is highly likely that the standard form of communication normally used will either be severely compromised or completely inoperable (e.g. landline and mobile phone networks, internet) and therefore other methods will need to be utilised.

The core focus in the initial phase of the response should be on utilising the HB CDEM VHF network to establish communications between agencies. Individual agencies may still be able to use their own VHF network to communicate internally. In addition, the HB CDEM GECC should utilise the satellite communications equipment available to establish connections to the NCMC and support other response facilities (this may include the deployment of the satellite trailer to the Emergency Services Base of Operations to enable communications between the two facilities).

Core objective:

To establish appropriate communication to enable coordination of the response and information sharing between key agencies

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Ensure the operability of the HB CDEM Group VHF Network to support communication between responding agencies

	<ul style="list-style-type: none"> Deploy satellite communications to enable communication with the NCMC and the Emergency Services Base of Operations
All other agencies	<ul style="list-style-type: none"> Ensure operability of VHF equipment to enable communication between the GECC and all responding agencies and internally with key response staff

3.5

Phase two- initiating sustained response activities

Phase two response priorities.

The following priorities exist for Phase 2 of the response in Hawke's Bay:

- Ensure immediate needs of the population are met
- Gain situational awareness
- Prioritise and manage resources

Providing rapid relief

Providing rapid relief in the early stages of the event is critical to ensuring that people can get through the initial impacts. Rapid relief includes food, water, shelter, and urgent medical needs.

This event is likely to require rapid relief provision to many thousands of people. The provision of rapid relief is likely to be hampered by the dispersed population and the access to resources. In the initial phase of the response the rapid relief provided may be extremely basic and rely heavily upon the community to support the effort until more coordination can be established and appropriate resources deployed.

Core objective:

To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses, 'Network of Networks' approach) Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event
All other agencies	<ul style="list-style-type: none"> Ensure provision of rapid relief in support of the GECC
Local authorities	<ul style="list-style-type: none"> Provide facilities to be utilised as emergency shelters and CDC's

Developing situational awareness

Gaining a clear understanding of the event and ensuring that all responding agencies have a shared understanding of what has happened is vital to enabling clear and effective decision making. In the early phase of the response developing situational awareness will be made difficult due to the lack of communications, restriction on movement due to road damage, potential loss of personnel and ability to establish response facilities.

Initial situational awareness may come from responders attending facilities and their observations of the event and the impacts. As the response progresses and communications are established between responding agencies coordinated impact assessments may begin to occur. These may be rapid impact assessments (general ground observations of the situation) in the first instance, but as time allows these will become more detailed and include street by street damage assessments, welfare assessments and lifeline asset damage assessments.

As the event progresses the situational awareness of all agencies should increase enabling more targeted response efforts in the worst impacted areas. For the development of situational awareness to be effective it is critical to establish clear communications between responding agencies as soon as possible to enable status

reporting to the GECC and ensure that key information is disseminated to all agencies.

Core objective:

Develop a clear understanding of the impacts of the event as soon as possible to support decision making.

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies Lead the welfare impact assessment process
FENZ	<ul style="list-style-type: none"> Lead the rapid impact assessment process and coordinate the collection of information by other emergency services Provide regular status reports to the HB CDEM GECC
NZ Police	<ul style="list-style-type: none"> Support the rapid impact assessment process Provide regular status reports to the HB CDEM GECC
St John Ambulance	<ul style="list-style-type: none"> Support the rapid impact assessment process Provide regular status reports to the HB CDEM GECC
HB DHB	<ul style="list-style-type: none"> Support the rapid impact assessment process Provide regular status reports to the HB CDEM GECC
Local authorities	<ul style="list-style-type: none"> Conduct building damage assessments Conduct utility damage assessments Support the welfare impact assessment process Provide regular status reports to the HB CDEM GECC

Welfare agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process • Provide regular status reports to the HB CDEM GECC
Lifeline utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments • Provide regular status reports to the HB CDEM GECC

Managed evacuation and exclusion

As situational awareness increases and there is more ability to respond in impacted areas, evacuations and exclusions may need to be implemented to prevent further risk to the population. This may be as a result of additional risk from the impacts (e.g. landslide risk, health risks etc) or to enable response activities to occur without risk to people in the area.

Evacuation of an area will require a door-to-door approach to be taken, as it is most likely that communications will be extremely limited in the early phases of the response. In addition, the resources to conduct managed evacuations are likely to be extremely limited.

Exclusion from areas will be required to prevent people returning where there is an increased risk or to maintain security until residents are able to return. The establishing of cordons may not be possible in the early phases of the response until appropriate resources become available and may not be possible at all in some areas due to the logistical requirements.

Core objective:

To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police

NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by HB CDEM Group • Establish cordons and exclusion zones
Local authorities	<ul style="list-style-type: none"> • Support cordon management with resources

Operational planning

In the initial phase of the response most activities will occur based on existing SOPs and plans of each agency. While some of the activities will have a level of coordination on the ground, there is likely to be some duplication of effort and confusion in exactly what needs to happen and a higher level of planning required to enable coordination across the entire response.

Initial action plans for the event are likely to be very basic and lack detail due to the limited information and scale of the event (See appendix 2, pg.38 for a draft event action plan). Operational planning can only begin to occur once clear communication has been established between agencies and there is a reasonable level of situational awareness regarding the impacts of the event and the issues that require response.

Core objective:

To ensure a coordinated response through a consolidated planning process across all responding agencies

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the HB CDEM Group Action Plan
All other agencies	<ul style="list-style-type: none"> • Contribute to the development of the action plan by identifying key tasks, issues and resource requirements

Management of resources

Due to the extent of the impacts, resources to respond are likely to be severely impacted. Careful management of these will be required at an early stage to ensure that priority issues can be responded to effectively.

In order to manage resources effectively, the HB CDEM Group will first need to understand what resources have survived the event and are available to respond. It will be critical for all responding agencies to identify their available resources at an early stage and provide this information to the HB GECC so that resources can begin to be used in the most effective way. Any critical resources need to be identified and prioritised for use or requested from the NCMC if not available in the region.

There is also likely to have been significant damage to supply lines and retail outlets, such as supermarkets and fuel sources. Existing supplies within the region will need to be managed and prioritised to ensure these are used as effectively as possible until resources can be brought into the region.

Core objective:

To ensure the most effective use of all available resources in response activities.

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise available response resources Identify any critical resource needs and request from the NCMC if not available within the region
All other agencies	<ul style="list-style-type: none"> Identify all available and critical response resources and provide to the HB GECC

3.6

Phase three- sustained response activities

Phase three response priorities

The following priorities exist for Phase 3 of the response in Hawke's Bay:

- Ensure on-going needs of the population are met
- Restore key lifeline services
- Support community response activities

Coordinated welfare delivery

The provision of welfare services to those impacted by the event will require coordination across multiple agencies and the community and will require significant resources to ensure people are able to manage through the event.

The region is likely to have significant numbers of displaced persons, including tourists, who have evacuated from the coast and cannot return to their homes. Potentially there could be thousands of people displaced long term as a result of the event, with many more only able to shelter in their homes and having limited access to utilities. While some of these people may be able to stay with friends and family in areas not as heavily impacted, a large majority will be reliant upon help to find accommodation and meet their basic needs for an extended period of time. Many of the supermarkets are located within the Napier CBD and these are highly likely to have been heavily impacted by the inundation. The supply of household goods and services will be a critical element of providing for the immediate and on-going needs of the population

In addition, several areas of Hawke's Bay will be cut-off from support due to infrastructure damage and may have to provide for their own welfare for several days until supplies can be taken in. Wairoa is likely to be separated from the rest of Hawke's Bay and critical supplies may need to be brought in from Gisborne in order to support the needs of the population there.

Core objective:

To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services.

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event including the provision of resources from neighbouring CDEM Groups where applicable • Ensure critical resources required to provide for on-going needs are prioritised
Welfare agencies	<ul style="list-style-type: none"> • Support the provision of on-going needs as requested by the HB CDEM Group • Identify any critical resource needs to enable the delivery of key welfare services

Restoration of essential lifeline services

Lifeline utilities are likely to have been very heavily impacted as a result of the event. The table below provides an estimate of the potential damage from the credible planning scenario.

It is recommended regional response planning further quantifies and refines the likely damage to lifeline assets following a large Hikurangi event.

Energy

- Bridge loss will take out key gas pipelines.
- Power out for at least a week in the region. Power restoration dependencies include:
 - Availability of Transpower Transmission Lines from Wairakei and Bunnythorpe
 - Road access to critical infrastructure

- Loss of Grid Exit Points (GXPs) and zone substations will have a significant impact on power supply availability and restoration
- Flooding on the coastal belt will cause extensive damage to distribution and zone substation assets. These areas may not be accessible to workers and potentially not a priority if areas are no longer habitable
- Underground cable networks will have extensive damage and may not be able to be assessed and repaired for an extended period
- A co-ordinated approach to generator management (availability and prioritised allocation)
- Co-ordinated approach to fuel supply management.

Water

- Potable water, wastewater and storm water supplies/infrastructure out for prolonged period (more than a week)
- Water supply and treatment assets located in coastal areas particularly vulnerable
- Priority would be for water supply and wastewater

Telecommunications

- Not operational for at least three days (min).
- Radio Broadcast non-operational.
- Bridge loss will take out key fibre communications

Transport

Extensive damage to the SH network including bridges and the lifeline assets which run alongside these assets:

- SH2 (Napier-Dannevirke) is estimated to take week(s) to restore. SH2 (Napier-Wairoa) restoration may take up to a month or longer:
- Loss of the route to Wairoa will isolate Wairoa from the rest of the Hawke's Bay,
- There is likely to be damage to roadside telecommunications assets and bridges including the Mohaka and Wairoa River bridges (Wairoa River bridge

carries telecommunications, water and wastewater assets for Wairoa).

- Esk River Bridge (SH2) carries several key utilities including Gas and telecommunications.
- Pandora Bridge carries gas, electricity, water/wastewater and telecommunications assets.
- SH 38 (Wairoa to Waikaremoana) – susceptible to earthquake damage and landslides, likely to isolate inland communities within the Wairoa district. SH38 Bridge (Wairoa River) carries main water supply for Wairoa)
- SH5 (Napier-Taupo) restoration may take several months. Potential damaged to telecommunications assets along roadside and bridges incl. Mohaka River bridge.
- Rail lines significantly damaged - no re-supply via rail into the region until restored

Port

- Napier Port is not operational following the event resulting in no seaport for inward re-supply or offloading facilities for fuel delivery until restored. In addition, the roads to Napier Port are vulnerable to liquefaction and landslide damage.
- Ahuriri Fuel Storage Tanks (Petrol and Diesel) damaged causing contamination/fire and resulting in no fuel storage in region.

Airport

- Land subsidence leaves HB Airport permanently inoperable (below sea level) resulting in no airfield near to Napier for re-supply.
- Bridge Pa airfield may be operational after some clearance of liquefaction
- Waipukurau and Wairoa Airfield estimated to be operational

Note that aviation fuel is normally transported via truck from Wellington, therefore aviation fuel is likely to be a critical resource during the initial response until supply is re-instated to the region.

Lifeline restoration priorities

In tandem to the prioritised repair of logistics enablers listed below; power, potable water and storm water supply restoration in areas where people are still able to live will need to occur as soon as possible to reduce dependency on services such as water tankers and emergency power generation.

In addition, fuel supplies in the region will be severely impacted by the event, e.g. Ahuriri Fuel store, and re-supply will be unlikely in the initial phases of the response. Without electricity, some fuel stations may also require generator support to access fuel stocks. Until inter-regional road connections and/or Napier Port infrastructure is restored, the region will need to use pre-existing fuel in the region for the emergency response and generators. Until fuel stores are reinstated, storage of fuel will be limited therefore there will be a reliance on tankers from outside the region to provide fuel until long term storage facilities are re-established. As a critical resource, distribution of fuel may need to be managed to ensure there is enough available for emergency operations.

All lifeline restoration is dependent on the availability of contractors, resources and access to lifeline assets. As these priorities are based on the planning scenario, please note they may need to be adjusted for the realised impacts of a future event.

1. Internal priority roads/access routes for emergency services:

In the early stages of the event priority will need to be given to clearing access routes to enable emergency response to occur and for the population to access assistance.

2. Bridge Pa, Waipukurau and Wairoa Aerodromes/Airfields:

Without the Hawke's Bay airport, the regions aerodromes will be a priority for the inwards movement of goods and response specialists, and the outwards movement of the critically injured needing specialist treatment. These could become logistics hubs for the region.

3. SH2 South between HB and Manawatū-Whanganui, SH2 North to Wairoa

Key supply routes will also need to be prioritised for restoration to enable resources to come into the region as soon as possible. Restoration of access routes from the south and north of the region (SH50, SH2) will enable supply lines from the central North Island to be re-established.

4. Napier Port

Restoration of the Port will enable the inwards mass movement of goods.

Core objective:

Restore basic services to the community to the maximum possible extent.

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise the restoration of lifeline services
Local Authorities	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so
Lifeline Utilities	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so

Supporting community response and engagement

The community will play an integral part in the response and will be vital in ensuring that the wider community is able to manage through the impacts of the response.

In the early phases of the response it is highly likely the community will provide for the immediate medical and welfare of those impacted by the event. While this may be sustainable in the short term, it will require support from the HB CDEM Group as supplies become limited, or more expertise is required.

Communities are also likely to lead the response efforts in their area in terms of debris clearance and this will need to be supported by the HB CDEM Group to ensure it occurs in a coordinated fashion and does not put anyone at risk.

Where possible, existing community groups should be utilised to provide information to the wider community and coordinate response efforts in their area.

Core objective:

Enable the community to lead the response effort where appropriate through the provision of resources and advice.

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Lead community engagement and provide supplies and resources to sustain community response efforts
All other agencies	<ul style="list-style-type: none"> Support community response efforts through provision of information, advice and resources

Debris and environmental management

The event will create a huge amount of debris, both from the earthquake and the tsunami. This is likely to require a large number of resources to clear and there will be a limited ability to separate any hazardous waste.

In the early phases of the response debris management may simply be piling up debris in place to clear access routes. Longer term, debris will need to be managed to ensure that hazardous substances and waste are cleared and stored where they pose no risk to human life. This may require the establishment of a specific facility to receive and sort waste and the development of additional landfill facilities within the region for disposal of the non-harmful waste. Hazardous and harmful waste will need to be transported to specific facilities outside the region but may need to be stored long term within the region before it can be disposed.

Core objective:

Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.

Agency	Responsibility
HB CDEM GECC	<ul style="list-style-type: none"> Coordinate the collection, removal, and disposal of debris
Local Authorities	<ul style="list-style-type: none"> Support the HB CDEM Group to manage the collection, removal, and disposal of debris and environmental hazards

3.7 Inter-regional response requirements

Working with neighbouring regions

The event will impact most regions in New Zealand, given the scale of the quake and generated tsunami. As a result, support from neighbouring regions may need to be sought to assist parts of Hawke’s Bay. This most likely to be the case for northern Hawke’s Bay, which will likely be cut-off from the remainder of the region, requiring the Tairāwhiti region to provide assistance.

It is most likely that Hawke’s Bay may also be requested to support some areas of neighbouring regions, for example the Dannevirke area which is likely to be separated from the rest of the Manawatu-Whanganui region.

Requesting support

Requesting support from a neighbouring region will require discussion between the National Controller and the two Regional Controllers. Memorandums of Understanding (MOU’s) created in readiness may facilitate this occurring more quickly in response.

The requirements for inter-regional support are discussed in Volume II of the HRP Toolbox.

Priority inter-regional information requirements

The following diagram shows the HB CDEM priority inter-regional information requirements to enable the emergency response. These include the status of neighbouring CDEM Groups, and key logistics nodes (e.g. Port) and links (e.g. SHs) into the region and that link with the Hawke’s Bay.

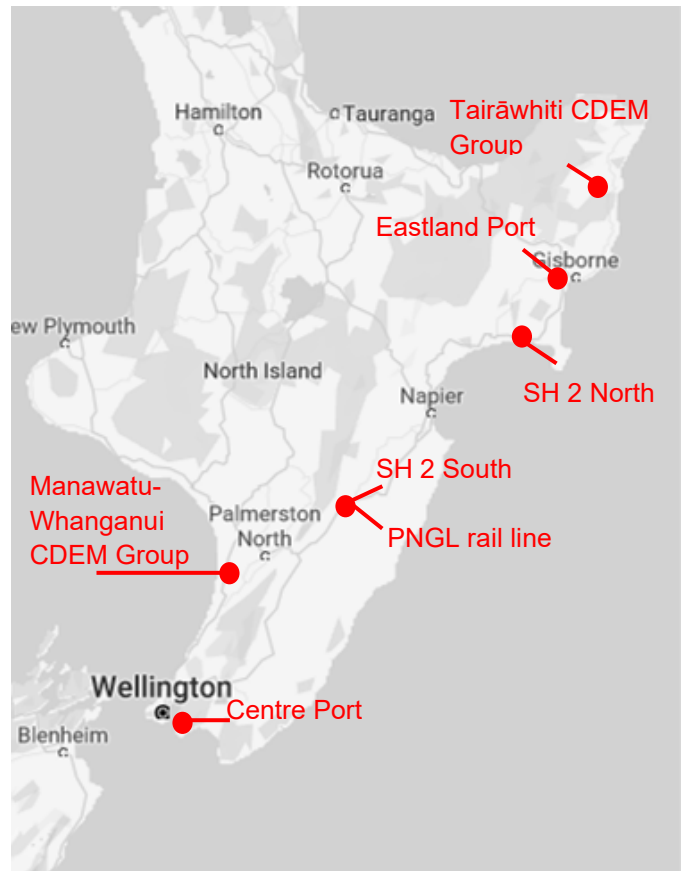


Figure: HB CDEM Priority inter-regional information requirement



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 4

LOGISTICS & LIFELINES



HAWKE'S BAY
EMERGENCY MANAGEMENT

GROUP

4.0 Logistical requirements

A number of logistical requirements exist that will enable the region to effectively respond to the impacts of the event.

The following information is intended as a 'starter-for-ten' for CDEM Groups- it is recommended the HB CDEM Group further refines the logistical requirements for a large Hikurangi event as part of the regional response planning process.

Priority sites

The following sites are a priority to re-establish basic lifeline services to enable them to function as soon as possible following the emergency:

Facility	Location
HB CDEM Group GECC	As per Section 3: Response Arrangements
Local Authority and Regional Council EOC's	
Emergency Services Base of Operations	
Hawke's Bay Hospital	Omahu Rd, Hastings
Wairoa Hospital	36 Kitchener Street, Wairoa 4108
Bridge Pa Aerodrome/Airfield	Bridge Pa, 4175
Waipukurau Aerodrome/Airfield	Waipukurau, 4200
Wairoa Aerodrome/Airfield	Airport Rd, Wairoa

Emergency electrical supply (generators)

As part of regional response planning it is recommended CDEM Groups scope the availability of emergency electrical supply (generators) in their region. The following table may be used as a starting point for HB CDEM:

Owner/location	Resource
HBRC	TBC as part of the regional response planning process.
Napier City Council	
Hastings District Council	
Wairoa District Council	
Central Hawke's Bay District Council	1KVA Transportable generator
Unison	
Hirequip	TBC as part of the regional response planning process.
City Hire Napier	
Hirepool	

Emergency water supply

As part of regional response planning it is recommended CDEM Groups scope the availability of emergency water supplies in their region.

Communications

The following sites should be prioritised for repair to enable VHF communications within the region:

- Kahuranaki VHF repeater site [REDACTED]
- Taraponui VHF repeater site [REDACTED]

Fuel supply

As part of regional response planning it is recommended CDEM Groups scope the availability of fuel supplies following a large Hikurangi event in their region. The following table may be used as a starting point for HB CDEM:

Operator	Fuel	Logistical requirements
BP Omahu Rd	Petrol/diesel	Power supply
CHB DC	Diesel	N/A
HBRC Depot	Diesel/limited petrol	N/A

Bridge Pa Aerodrome	Aviation fuel	Power supply
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Supermarkets

The following supermarkets may be able to operate following the event in the Hawke’s Bay region:

Operator	Location
Pak N Save	Hastings
Countdown	Hastings
New World	Greenmeadows / Hastings / Havelock North / Waipukurau / Wairoa
4 Square	Hastings / Havelock North / Waipawa / Wairoa

Key operational dependencies

The key operational dependencies of response facilities and networks in the Hawke’s Bay region are detailed in the table below.

Facility/network	Dependencies
Hawke’s Bay Hospital	Fuel supply (generators) / electricity supply / Gas supply
Hawke’s Bay GECC	Fuel supply (generator) / Electrical supply / Telecommunications
Emergency Services coordination facilities	Fuel supply (generator) / Electrical supply / Telecommunications
Electrical network	Generation facilities / Fuel supply / road access
Telecommunications network	Fuel supply (generators) / road access / power supply
Fuel supply / Distribution	Power / road access / offloading facility at the Port of Napier / storage

Airfields (Bridge Pa / Waipukurau)	Fuel supply / Electrical supply / telecommunications (VHF)
Roading network	Fuel supply
Rail network	Fuel supply / Road access
Napier Port	Road access / electrical supply / fuel supply



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 5

APPENDICES



HAWKE'S BAY
EMERGENCY MANAGEMENT

GROUP

Appendix 1: Response assumptions

Following a large Hikurangi event, it is assumed:

- **The process of declaring local states of emergency will be initiated immediately.**

A large Hikurangi event will have significant impacts on all five CDEM Groups. It is assumed local authorities and CDEM Groups affected will immediately initiate the process of declaring states of local emergency.

- **A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.**

It is assumed that a state of national emergency will be declared within 24 hours due to the scale of impact and the need for operational coordination of national resources in response to an emergency of this size. Ultimately, this is the decision of the Minister of Civil Defence, on advice of the National Controller and/or Director of Civil Defence Emergency Management.

Following declaration, the National Crisis Management Centre (NCMC) will direct the overall response. The NCMC will be situated in Wellington or at its secondary location in Auckland.

- **CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.**

A large Hikurangi event will significantly impact the five CDEM Groups. This will lead to a reduced level of operations immediately following the initial earthquake and subsequent tsunami impacts. It is not expected that the five CDEM Groups will be able to immediately activate and lead a coordinated response.

Each of the five CDEM Groups on the North Island East Coast have primary and secondary or mobile Emergency Coordination Centres (ECCs). Most Emergency Operations Centres (EOCs) have primary and secondary locations in each of the five Groups. The community, local, regional and multi-agency response will be led and coordinated from these centres including communication and coordination with other CDEM Groups and the NCMC.

- **The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.**

The NCMC will be functional but will initially be operating at reduced level. The NCMC will be able to coordinate the national response in Wellington or from its alternative site in Auckland.

- **Initial tsunami threat maps are estimated to be produced by the National Geohazards Monitoring Centre (NGMC) within 20-30 minutes**

Following a large Hikurangi event it is estimated it could take approximately 20-30 minutes for the National Geohazards Monitoring Centre (NGMC) to make an initial assessment and relay initial threat maps to the NEMA duty team using alternate communications, e.g. satellite phone and BGAN, if necessary. The NEMA Duty Team would then pass this information onto CDEM Groups to inform decision making.

- **Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.**

A large Hikurangi event will impact Groups wider than those scoped by this framework. This framework does not assume the five CDEM Groups will receive any assistance from near or neighbouring CDEM Groups as it is likely they will be dealing with their own impacts. Depending on their capacity, CDEM Groups in lower South Island and upper North Island

(e.g. Northland CDEM) may be available to assist those most affected. Offers and requests for inter-Group assistance will be coordinated by the NCMC.

- **Local Government within the North and South Island will continue to operate but with reduced capacity and capability**

North and South Island authorities (local and territorial councils), will continue to operate but with reduced capacity and capability. Local government authorities, with regulatory oversight responsibility, will continue their same roles and responsibilities during the response, most likely at an initial reduced capacity.

- **Responding agencies will be functional but operating with reduced capacity and capability**

Responding local, regional and national agencies (such as emergency services, health services and welfare services) will self-activate within affected areas where those agencies have a presence. Like local authorities, national and regional responding agencies will initially be operating at reduced capacity.

- **Secondary hazards, including tsunamis, will occur throughout the response affecting response and recovery.**

Triggered by a large Hikurangi earthquake, secondary hazards such as tsunamis, aftershocks, land subsidence and uplift/lateral spreading, liquefaction, landslides, rockfall, fire, flooding, dam collapse, building collapse, fire and seiching of large water bodies will pose an additional risk to life and will significantly impair the response and recovery processes.

- **Standard communications will be limited, where available, alternate communications will be used**

A large Hikurangi event will affect standard communications (including phones and internet) (See Section 3.1.5 for further detail). Responding Groups will need to rely on alternate methods to communicate. In some cases, alternate communication methods may be also be impacted by the event (e.g. loss of radio systems due to tower collapse or loss of power to a tower). Communication may be hampered by the incompatibility of systems used by CDEM Groups and responding agencies.

- **Lifeline utilities will be limited or unavailable in the five CDEM Groups.**

Lifeline utilities, including the three waters, power and telecommunications, will be limited or unavailable in the five CDEM Groups for at least 7 days following the initial earthquake and tsunami impacts. Secondary hazards, such as landslides and aftershocks will impact the ability to restore these networks.

- **Movement corridors will be affected, and many roads will be unusable**

Landslides, lateral spreading and liquefaction will lead to many roads becoming unpassable, isolating some communities and CDEM Groups. This will significantly impact the supply chain and the mobility of responding agencies within and between regions.

- **Rail will be inoperable within the five CDEM Groups**

Rail networks in and between the five CDEM Groups, including the Wellington Regional network, Main Trunk Line and the Palmerston North - Gisborne Line (PNGL), will be unusable during response.

- **Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.**

All airports within the five CDEM Groups will experience severe shaking and will require assessment before being able to be declared operational. Even opened most will have operational restrictions due to the wider impacts, such as loss of power and standard communications.

It is assumed that Hawke's Bay airport will be permanently non-operational due to forecasted subsidence reclaiming the land to sea. Wellington airport is likely to be impacted by tsunami debris and not expected to be available until E +3 days. Gisborne and Palmerston North Airport are anticipated to be operational following assessment.

Additional assessments will be required following any substantial aftershock or tsunami.

- **Ports will be impacted by the earthquake and tsunami.**

Tauranga, Gisborne, Napier and Wellington Ports will be affected by earthquake and tsunami. Tsunami debris will likely damage critical assets such as piers and wharves, limiting their use until repaired. Liquefaction may also compromise foundations, destabilising port infrastructure. Assessments and harbour surveys will be required before the ports can be opened.

Additional assessments will be required following any substantial tsunami.

- **Health and welfare services will be overwhelmed.**

The large number of injuries and fatalities expected will overwhelm health services within the five CDEM Groups (See Appendix A.2: 'SitRep') Welfare services will be overwhelmed, especially due to the persons displaced, and possibly separated, during the immediate mass evacuation.

There will be significant international concern over family and friends who are unable to be contacted in the immediate aftermath of the response.

- **Communities will be isolated.**

Many communities will become isolated due to transport infrastructure damage or physical barriers, e.g. lateral spreading, wash outs, tsunami debris, liquefaction and/ or landslides. Depending on the scale of damage, it may take days to weeks to reach some isolated communities

- **Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.**

Many members of the public will self-evacuate (as encouraged through the 'long or strong, get gone' messaging) inland or to higher ground following the earthquake shaking.

A large proportion of those who self-evacuate will require assistance after reaching higher ground, inland areas or buildings if vertical evacuation has taken place. They may only have the items they evacuated with and will therefore have immediate needs - delays meeting these needs are likely to worsen health outcomes.

- **Depending on the time of day significant numbers will be displaced from their home locations.**

A large Hikurangi event could occur at any time. A daytime event in the working week will result in many people unable to return home in the initial response phase. These displaced people will need their immediate needs met. These displaced people will want to return to their families and home as soon as possible.

- **The community-led and tangata whenua response will work to meet communities immediate and basic needs where possible.**

Spontaneous community volunteer groups are to be expected to activate, and marae manaaki (hosting) is very likely where buildings are safe. Iwi/Taiwhenua and Haurora Providers will very likely activate their own response to the crisis. Community halls, facilities and homes may also be opened to vulnerable people. It is likely the spontaneous community-led and tangata whenua response forms to address the immediate needs of the community before official assistance from responding agencies can arrive.

- **Ordered mass-evacuation will not automatically occur.**

There will not be an automatic ordered evacuation of a large part of the general population from affected areas (excluding Emergency Mobile Alerts encouraging the public to evacuate tsunami evacuation zones). Any ordered evacuation that does occur will be covered by the National Action Plan and will be planned for and facilitated in partnership with affected CDEM Groups.

Note: Ordered mass-evacuation is independent of immediate self-evacuation for life safety (e.g. responding to a long or strong earthquake) which may be informed by Emergency Mobile Alerts (where power and telecommunication networks allow).

- **There will be significant and long-term environmental impacts.**

Fuel, chemicals and hazardous materials (e.g. human waste, milk waste) may be leaked during the earthquake and/or tsunami, leading to environmental damage but also health and safety risks for responding agencies.

A large amount of debris, e.g. building facades, harmful materials-asbestos, soil and rock, will be generated by this event, altering and in some cases harming the environment. This debris may block transport routes reduce the mobility of responding agencies.

- **National and regional assembly areas will be established in accordance with national and regional plans.**

The NCMC will direct Regional Assembly and Staging Areas (Air and Sea) to be established to enable the storage, organisation and mobilisation of resources required by the response. The locations to be used will be assessed for damage following initial and follow-on impacts

- **Offers of international assistance will be made and coordinated through the NCMC.**

Offers of or requests for international assistance will result from this event. These will be managed by MCDEM and considered by the National Security Committee of Cabinet (NSC), via the Officials Committee for Domestic and External Security Coordination (ODESC) system

Appendix 2 – Core objectives and agency responsibilities

Activity	Core objective	Agency responsibilities	
Phase one – Immediate response activities			
Alerts and notifications	<i>To ensure responding agencies within the region are alerted to issues relating to the event</i>	HB CDEM GECC	<ul style="list-style-type: none"> Ensure that regional warning system is utilised where possible to keep all responding agencies informed. Implement alternate alerting methods where regional warning system is not able to be used.
		All other Agencies	<ul style="list-style-type: none"> Ensure that alerts and notifications are disseminated to all key staff
Warning and Informing the public	<i>To ensure timely provision of key emergency information to people impacted by the event</i>	HB CDEM GECC	<ul style="list-style-type: none"> Coordinate the provision of emergency information to the community across all available platforms
		All other Agencies	<ul style="list-style-type: none"> Ensure key emergency information is provided to the community in coordination with the HBCDEM PIM Function
Self-evacuation and Life Safety	<i>To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction</i>	HB GECC	<ul style="list-style-type: none"> Provide clear direction with regards to safe zone locations and evacuation routes
		NZ Police	<ul style="list-style-type: none"> Direct people to evacuate from areas at risk of inundation Support traffic management where safe to do so
		Fire and Emergency NZ	<ul style="list-style-type: none"> Coordinate USAR activities in impacted areas as the situation allows
		St John Ambulance	<ul style="list-style-type: none"> Provide medical assistance to those impacted by the event as the situation allows Support FENZ with USAR activities by providing medical assistance Transport injured persons to healthcare facilities
		HB DHB	<ul style="list-style-type: none"> Ensure capability to meet the medical needs of the impacted population
		Local Authorities	<ul style="list-style-type: none"> Support evacuation of people from coastal areas
Response Activation and Mobilisation	<i>To activate appropriate response facilities to</i>	HB CDEM GECC	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the GECC Support key staff to access the GECC facility as required

	<i>enable coordination of the response at all levels</i>	Emergency Services	<ul style="list-style-type: none"> • Activate the Base of Operations [REDACTED] and mobilise resources to respond
Establishing communications	<i>To establish appropriate communication to enable coordination of the response and information sharing between key agencies</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Ensure the operability of the HB CDEM Group VHF Network to support communication between responding agencies • Deploy satellite communications to enable communication with the NCMC and the Emergency Services Base of Operations
		All other agencies	<ul style="list-style-type: none"> • Ensure operability of VHF equipment to enable communication between the GECC and all responding agencies and internally with key response staff

Activity	Core objective	Agency responsibilities	
Phase two – initiating sustained response activities			
Providing Rapid Relief	<i>To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses) • Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event
		Welfare Providers	<ul style="list-style-type: none"> • Ensure provision of rapid relief services in support of the GECC
		Local Authorities	<ul style="list-style-type: none"> • Provide facilities to be utilised as emergency shelters and CDC's
Developing Situational Awareness	<i>Develop a clear understanding of the impacts of the event as soon as possible to support decision making</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies • Lead the welfare impact assessment process
		Fire and Emergency NZ	<ul style="list-style-type: none"> • Lead the rapid impact assessment process and coordinate the collection of information by other emergency services • Provide regular status reports to the HB CDEM GECC
		NZ Police	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the HB CDEM GECC
		St. John Ambulance	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the HB CDEM GECC
		HB DHB	<ul style="list-style-type: none"> • Support the rapid impact assessment process

			<ul style="list-style-type: none"> • Provide regular status reports to the HB CDEM GECC
		Local Authorities	<ul style="list-style-type: none"> • Conduct building damage assessments • Conduct utility damage assessments • Support the welfare impact assessment process • Provide regular status reports to the HB CDEM GECC
		Welfare agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process • Provide regular status reports to the HB CDEM GECC
		Lifeline Utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments • Provide regular status reports to the HB CDEM GECC
Managed evacuation and exclusion	<i>To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police
		NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by HB CDEM Group • Establish cordons and exclusion zones
		Local Authorities	<ul style="list-style-type: none"> • Support cordon management with resources
Operational Planning	<i>To ensure a coordinated response through a consolidate planning process across all responding agencies</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the HB CDEM Group Action Plan
		All other agencies	<ul style="list-style-type: none"> • Contribute to the development of the action plan by identifying key tasks, issues and resource requirements
Management of resources	<i>To ensure the most effective use of all available resources in response activities</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise available response resources • Identify any critical resource needs and request from the NCMC if not available within the region
		All other agencies	<ul style="list-style-type: none"> • Identify all available and critical response resources and provide to the HB GECC

Activity	Core objective	Agency responsibilities	
Phase three – sustained response activities			
Coordinated welfare delivery	<i>To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services</i>	HB CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event • Ensure critical resources required to provide for on-going needs are prioritised
		Welfare agencies	<ul style="list-style-type: none"> • Support the provision of on-going needs as requested by the HB CDEM Group

			<ul style="list-style-type: none"> Identify any critical resource needs to enable the delivery of key welfare services
Restoration of essential lifeline services	<i>Restore basic services to the community to the maximum possible extent</i>	HB CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise the restoration of lifeline services
		Local Authorities	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so
		Lifeline Utilities	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so
Supporting community response and engagement	<i>Enable the community to lead response where appropriate through the provision of resources and advice</i>	HB CDEM GECC	<ul style="list-style-type: none"> Lead community engagement and provide supplies and resources to sustain community response efforts
		All other agencies	<ul style="list-style-type: none"> Support community response efforts through provision of information, advice and resources
Debris management	<i>Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.</i>	HB CDEM GECC	<ul style="list-style-type: none"> Coordinate the collection, removal and disposal of debris
		Local Authorities	<ul style="list-style-type: none"> Support the HB CDEM Group to manage the collection, removal and disposal of debris

Appendix 3 – Hikurangi earthquake and tsunami draft event action plan

Event name:	AP Number:
Hikurangi Subduction earthquake and Tsunami	1
Operational period from:	Coordination facility:
	Hawke’s Bay Group Emergency Coordination Centre
Operational period to:	Controller:

Summary of Incident / Event: (A summary of the hazard impacts, environment and response actions to date, including the most dangerous and most likely hazard scenarios. This is based on reconnaissance and status reports.)

- Mw 8.9 earthquake occurred on the Hikurangi subduction zone **at enter time and date here**. The earthquake was centred on **the central** portion of the Hikurangi subduction zone.
- A large tsunami was generated by the earthquake; the first wave arrived at Napier **Enter time of arrival here**; waves will continue for up to 24 hours. Large numbers of people have self-evacuated inland and to Napier Hill. An ‘all clear’ to return into the tsunami evacuation zone will not be issued until the risk of further inundation has abated.
- Impacts are not limited to Hawke’s Bay, with damaging shaking experienced, and associated tsunami impacts across the North Island and top of South Island limiting the capacity of other CDEM Groups to support response in the worst hit areas.
- Ongoing aftershocks and associated tsunami continue-limiting the ability of emergency services to assist the trapped and injured within the tsunami evacuation zones.
- There is a large amount of isolation due to physical barriers and unavailable comms. This isolation applies to communities, resources and emergency services.
- The impact to engineering lifelines and transport nodes/links has been severe. There is limited communication, electricity and potable water.
- Many persons are displaced overwhelming the capacity of welfare systems to cope. These people have urgent and unmet needs such as food, water, shelter and clothing.
- The DHB is overwhelmed with the amount of injuries presenting at primary and secondary health centres. Medical supplies are limited, and generators will be required to continue operating.
- This event is unprecedented, provision of life safety advice and reassurance is paramount to maintaining public order and saving lives as secondary hazards continue.

Mission: (Mission Statement.)

To ensure a coordinated and timely response to minimise loss of life and prevent escalation of suffering.

Intent: (Give the intent, best stated as a concept, key tasks and end-state. It is a broad statement of what must happen and when.)

To provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles. This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- The public are protected from entering dangerous areas
- People's basic and immediate needs are met as quickly as possible
- People can access adequate medical assistance
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

The key priorities for the response are:

- Conduct life safety activities
- Identify and source key resources needed for response
- Establish response coordination arrangements
- Ensure immediate needs of the population are met
- Provide the public with appropriate response information
- Gain situational awareness
- Prioritise and manage resources

Designated Tasks: (Specific tasks and timings for each agency under the plan.)

HB CDEM GECC

- Ensure that responding agencies are kept alerted and informed with regards to the event and its impacts
- Coordinate the provision of emergency information to the community to reassure and support response activities
- Establish the GECC and communications to support the sharing of information between responding agencies
- Support the displaced population through the coordination of rapid relief and emergency shelter
- Coordinate the collection and analysis of information to inform situational awareness across all responding agencies
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons
- Coordinate the Group-wide response planning process
- Coordinate and manage the acquisition and prioritisation of response resources and emergency welfare resources

New Zealand Police

- Establish Base of Operations [REDACTED]
- Carry out evacuations of identified areas as requested by the HB CDEM GECC
- Establish and maintain access control measures into evacuated areas

- Maintain law and order
- Support rapid impact assessment process
- Support Fire and Emergencies New Zealand USAR activities
- Establish Inquiry and Disaster Victim Identification (DVI) process

Fire and Emergencies New Zealand

- Establish Base of Operations [REDACTED]
- Coordinate USAR activities in impacted areas as situation allows
- Establish rapid impact assessment process where safe to do so

St. John Ambulance and Hawke's Bay DHB

- Attend to urgent medical needs as situation allows
- Support Fire and Emergencies New Zealand USAR activities
- Activate all operable medical facilities to support management of casualties
- Establish temporary morgue facilities as per mass fatality plan
- Support on-going medical needs of population

Local Authorities

- Support the operation of the GECC and local EOC's with appropriate staff to conduct key roles
- Support the rapid impact assessment process and the collection of community impact information
- Conduct lifeline utility damage assessments and establish temporary arrangements for water distribution
- Clear key routes within district to enable response activities to occur
- Respond to public health issues as situation allows
- Support the implementation of access control arrangements

Welfare Agencies

- Support the provision of rapid relief to the impacted population
- Support the rapid impact assessment process and the collection of community impact information

Te Puni Kōkiri (national and regional offices)

- To work with other government agencies and CDEM Groups to facilitate and co-ordinate support to Māori who require assistance, and to engage with iwi, hapū, whānau, and Māori communities to ensure their needs are met.
- To coordinate links with Iwi organisations to Māori communities to provide key emergency information and status reports

Lifeline Agencies

- Ensure key routes are cleared and alternate routes established where access is no longer possible to support response activities

- Establish access to emergency power supplies and re-establish electricity network where possible to do so
- Establish temporary access to communications

Limiting Factors: (Matters that may or will limit options, timeframes, or outcomes.)

Matters that may or will limit options, timeframes and/or outcomes:

- Emergency services and USAR are limited in carrying out their initial action plans in tsunami evacuation zones by the ongoing threat of tsunami,
- Food and potable water supplies are limited within the Group
- Damage to the medical supply chain combined with a stretched health service (low staff numbers and high community demand) is leading to worsening health outcomes,
- Damage to power and telecommunication infrastructure is limiting the effectiveness of multi-agency coordination,
- Damage to transport infrastructure, e.g. from liquefaction or lateral spreading, is limiting the mobility of responding agencies around the region,
- Significant numbers of displaced people,
- The ability to sustain the immediate and basic needs of affected populations,
- Availability and ability of critical personnel to get to key areas e.g. engineers to certify use of assets & key medical staff to get to key medical facilities

Coordination Measures: (Times, locations, boundaries, and other measures designed to coordinate the response.)

- The Group Emergency Coordination Centre is established at 311 Lyndon Road East, Hastings and is operating 24/7
- The Emergency Services Base of Operations will be established [REDACTED]
- The Wairoa Local EOC is established at the Wairoa Hospital and is operating 24/7
- The Central Hawke's Bay Local EOC is established at the CHBDC Offices, Waipawa and is operating 24/7
- ESCC meetings are occurring via satellite phone [REDACTED]
- GECC IMT meetings are [REDACTED]
- Sitreps are released [REDACTED]
- Status Reports are required from all agencies [REDACTED]

Resource Needs: (Who will provide what and when they will do it – including: information, supply, personnel, equipment and transport.)

The HB CDEM Group requires assistance as soon as possible in the form of:

- Food, water, medical supplies and emergency shelter
- Fuel and generators
- NZDF and International Defence Forces support for logistics and operations (ships, helicopters, terminal operations teams, fuel delivery systems, water purification etc.)
- CDEM staff for operations centres

- Surge support from the emergency services (incl. USAR and DVI specialists)
- Surge support from other responding agencies and organisations
- Medical staff and facilities
- Building and transport infrastructure assessors including technical experts for the detailed inspection of buildings and structures
- Assets to enable reconnaissance

Information Flow: (Who needs to know and who has information we need? May include key information requirements, or they may be attached.)

Information inputs:

- Warnings and alerts from NEMA / GNS
- Situational awareness information gathered from rapid impact assessments, community and status reports
- NCMC Action Plan and situation reports
- Resource requests

All status reports to be sent to [REDACTED]

Information outputs:

- Public information and alerts / warnings to responding agencies and public
- Situation reports
- Action Plan
- Resource requests to NCMC

Public Information Plan: (Outline of intended public information processes and outputs. This may be attached.)

Establish a regular schedule for the provision of warnings, life safety advice, information regarding the situation and reassurance regarding the response. Public communications will use consistent messaging guides where possible.

If standard telecommunications are not working, alternate means of communicating will need to be utilised.

Communications Plan: (Frequencies / purpose / coverage, role cell phone numbers communications schedule, etc..)

The Group ECC will utilise the [REDACTED] **VHF Channels** to conduct communications with responding agencies

Where possible, this will be supplemented by satellite communications as available. The Group satellite phone numbers are as follows:

[REDACTED]

[REDACTED]

[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	
[REDACTED]	

Appendix 4: Supporting diagrams

The following diagrams are based on the credible planning scenario and support the response concepts included this paper and in Volume II of the Hikurangi Response Planning toolbox. Please note the following diagrams are ‘examples’ only and are based on the credible planning scenario. They do not reflect planned response arrangements between the five CDEM Groups (Bay of Plenty, Tairāwhiti, Hawke’s Bay, Manawatū-Whanganui and Wellington) and estimated lifeline impacts require further refinement as part of regional response planning.

Figure 1: Inter-regional support (overleaf)

Following a large Hikurangi event it is likely some CDEM Groups may not have the capacity or capability to coordinate the response in one or more of their communities, requiring another CDEM Group with the capability and capacity to help by coordinating beyond its boundaries, for example, where a physical barrier, such as a landslide, may be isolating a community. Coordination across boundaries may also be necessary to achieve an effect, e.g. reconnaissance of an asset.

The decision for a CDEM Group to coordinate the response in a community beyond its boundaries would be a joint decision between the two CDEM Groups involved and would be in consultation with the National Controller and appropriate stakeholders.

Additionally, it is important to note some agency boundaries, such as NZ Police and Fire and Emergency NZ (FENZ) regions, do not align to regional council boundaries. Engagement and response planning with these agencies therefore requires a coordinated approach between the CDEM Groups and the agencies involved.

The requirement for national CDEM support and coordination should be identified and planned for where regions do not have the capability or capacity to meet response requirements themselves, or with direct coordination with adjacent regions.

Figure 2: Response Islands (overleaf)

This figure demonstrates the ‘response island’ concept at a regional scale, adapted from the Wellington Region Earthquake Plan (WREP). Please refer to the WREP for further information about response islands specifically in a Wellington context.

Following the credible scenario, landslides and/or damage to roading infrastructure is anticipated to isolate Tairāwhiti, Hawke’s Bay and Wellington regions, effectively creating ‘response islands’.

Until inter-regional road connections are restored, these regions will need to use alternate means (e.g. ships/planes) to fly people and resources into and out of the region.

Figure 3: Lifeline impacts – utilities (overleaf)

The figure below shows the estimated availability of lifeline utilities within the first seven days following the credible scenario. In the worst affected CDEM Groups, it is likely there will be no power, telecommunications, wastewater or potable water available within the first seven days following the credible scenario. It is important regional response planning plans for a response where these services are not available for a prolonged period of time.

Figure 4: Lifeline impacts – transport infrastructure (overleaf)

The figure overleaf shows the estimated damage and restoration times for transport infrastructure following the credible scenario. As shown in the figure, a large Hikurangi event could significantly affect inter-regional road connections, regional airports and ports. Significant damage or loss of this critical infrastructure would affect the way CDEM Groups respond to a large Hikurangi event and should therefore be considered as part of regional response planning.

Figure 1: Inter-regional support

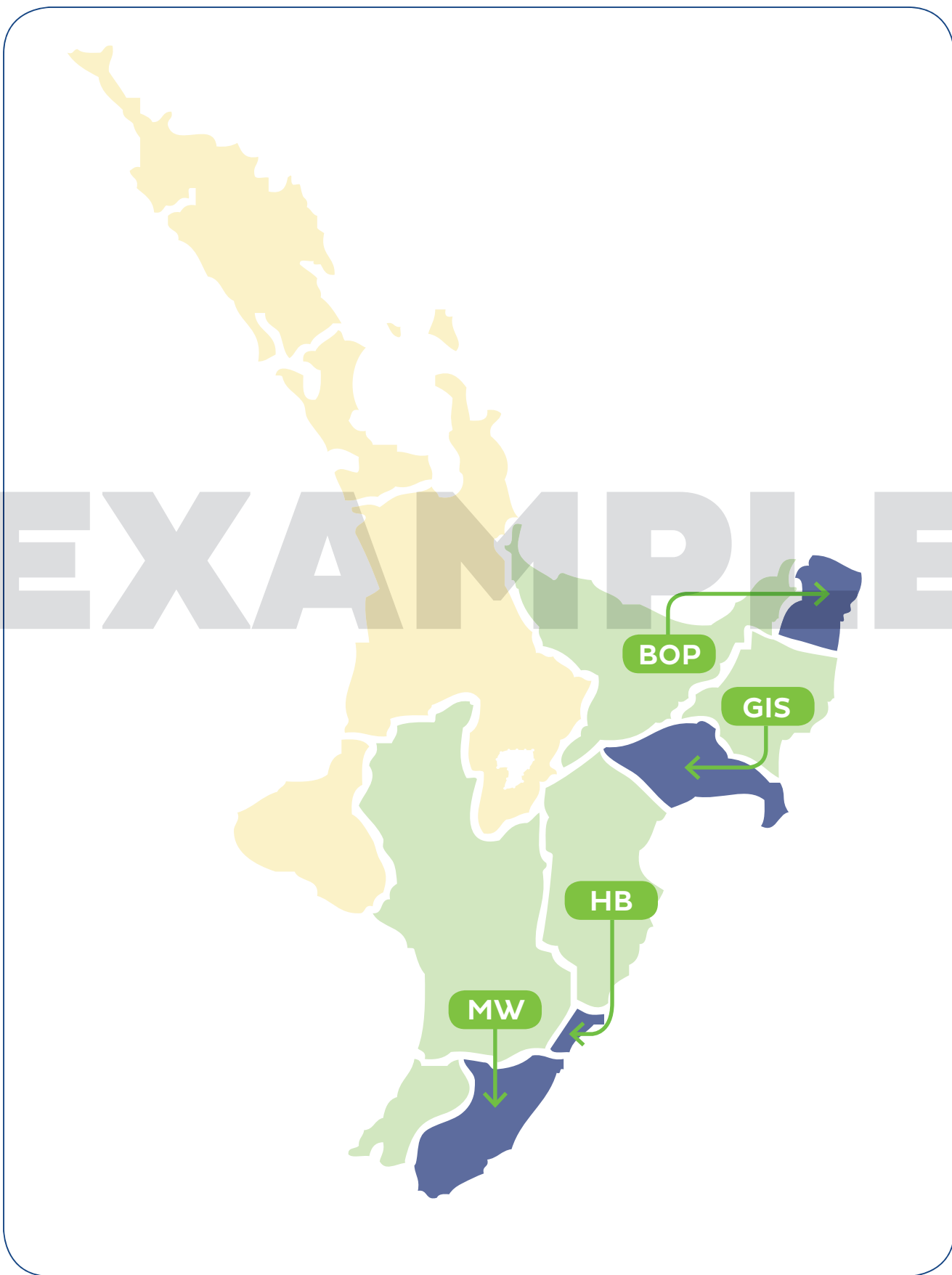
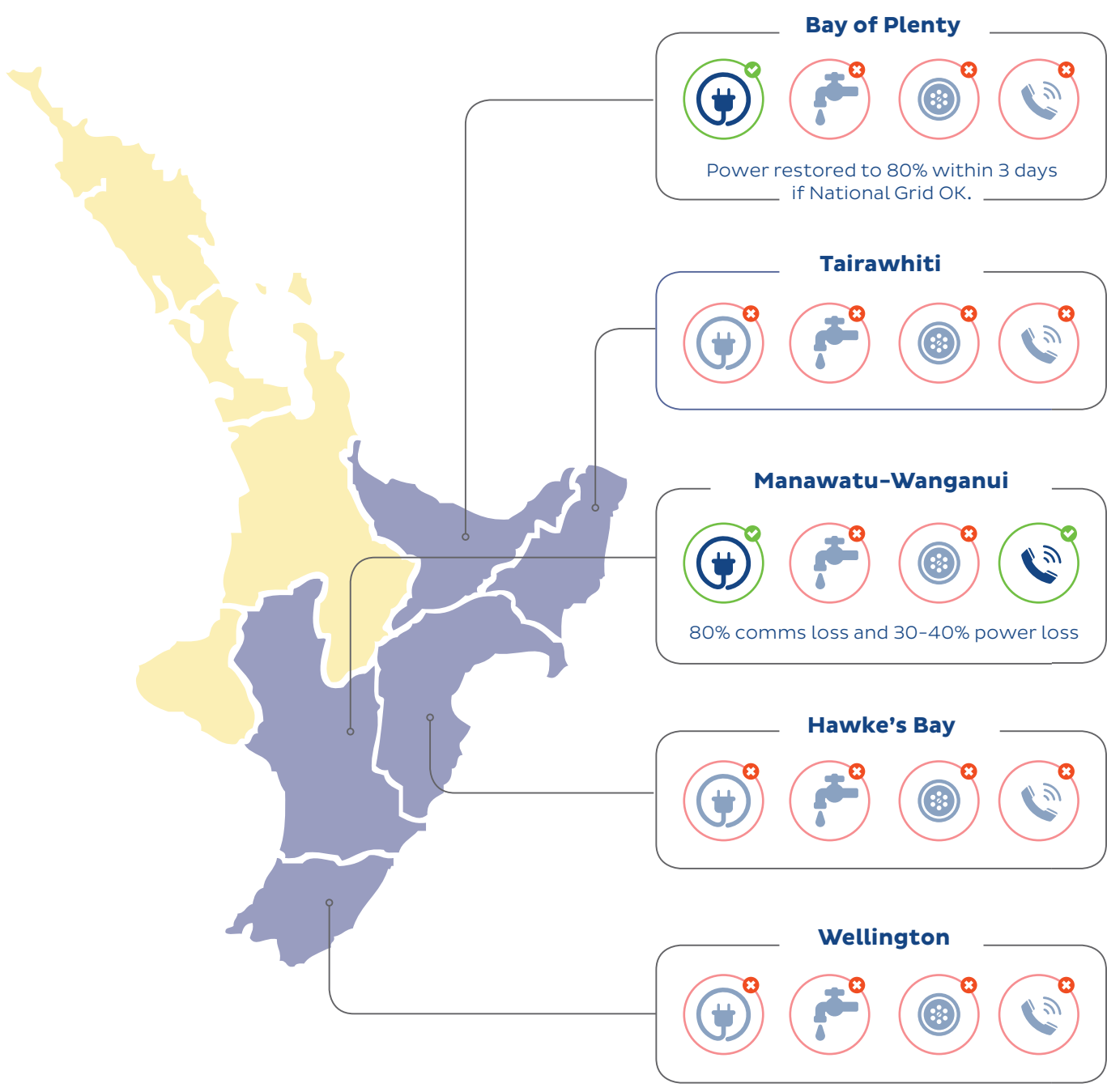


Figure 2: The 'island' concept



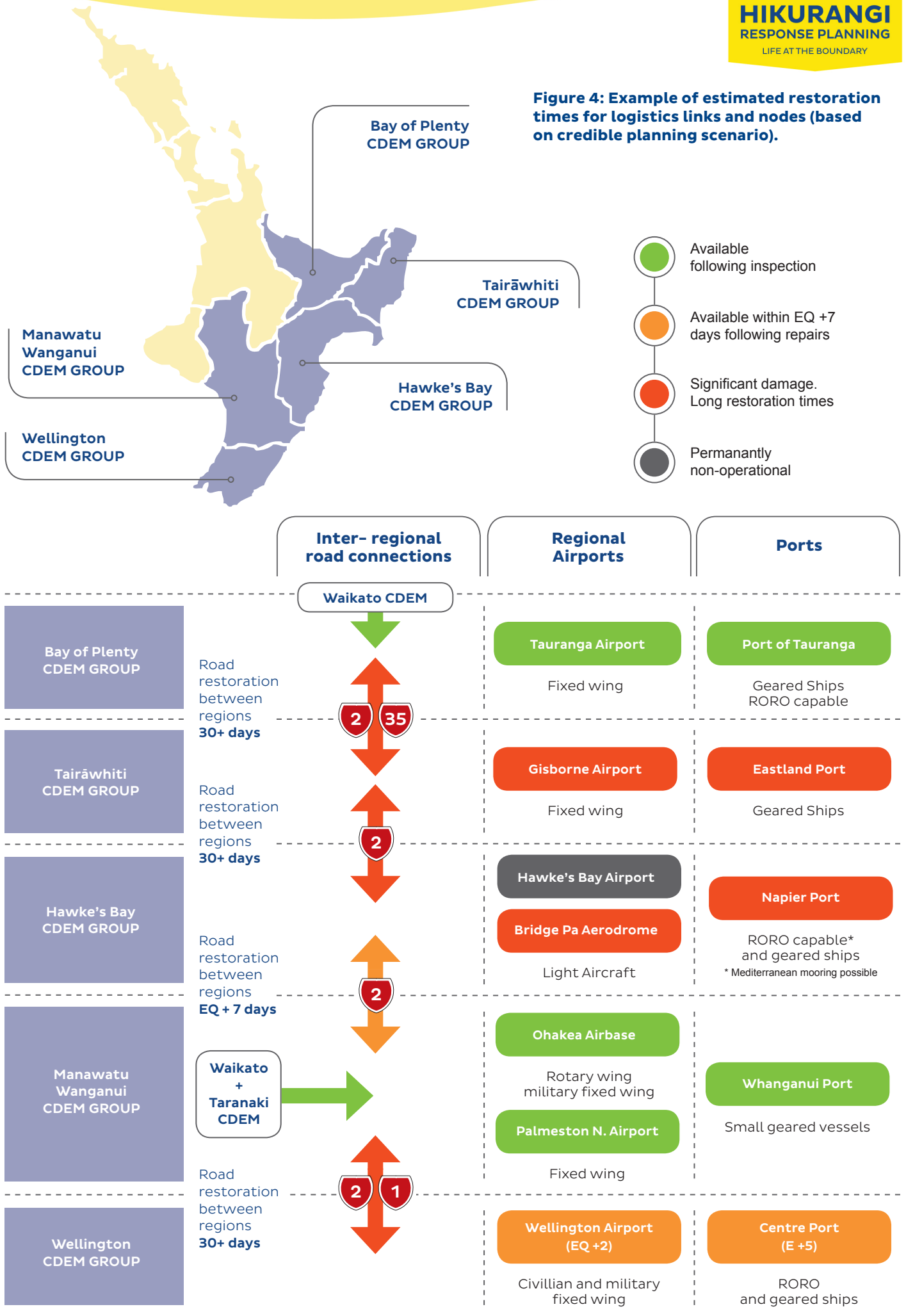
Figure 3: Example of lifeline utility availability in first seven days following credible scenario



KEY

- Power
- Potable water
- Waste water
- Telecommunications

Figure 4: Example of estimated restoration times for logistics links and nodes (based on credible planning scenario).



- Available following inspection
- Available within EQ +7 days following repairs
- Significant damage. Long restoration times
- Permanently non-operational



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

MANAWATŪ WHANGANUI CDEM GROUP

Hikurangi Subduction Zone Response Concept Paper 2020

Prepared by
East Coast Life at the Boundary (ECLAB)



MANAWATU-WANGANUI
EMERGENCY MANAGEMENT GROUP

Approved by:

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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 1

INTRODUCTION



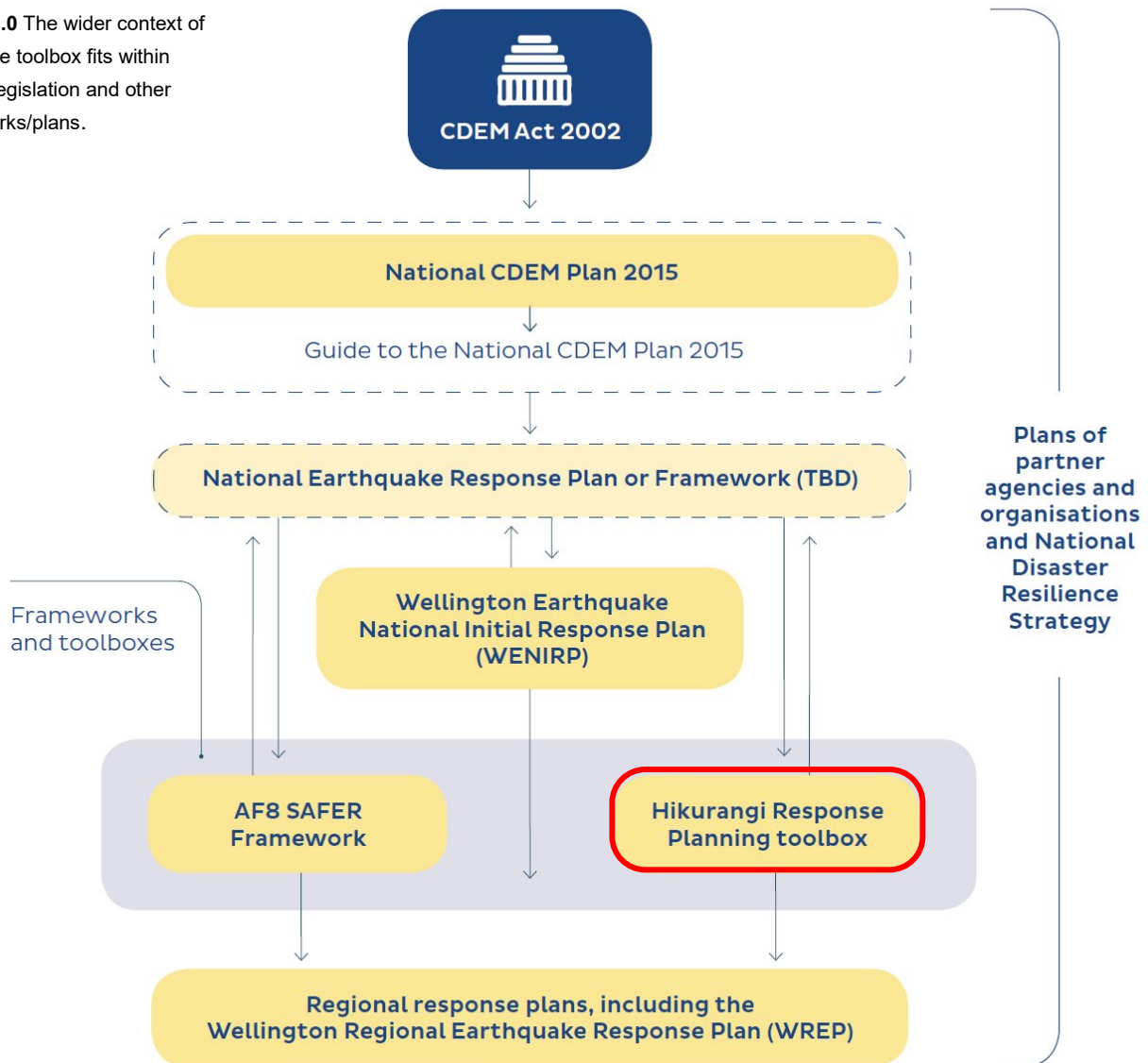
MANAWATU-WANGANUI
EMERGENCY MANAGEMENT GROUP

1.0

Purpose of the document

The purpose of this document is to outline the proposed response arrangements within the Manawātū-Whanganui CDEM Group to guide the response to a large earthquake and tsunami generated from the Hikurangi Subduction Zone in advance of any planning under a national earthquake and tsunami framework (TBD). This Regional Response Concept paper intends to provide a basis and starting point for regional response planning for a large Hikurangi event and fits within the Hikurangi Response Planning toolbox as pictured below (Figure 1.0).

Figure 1.0 The wider context of where the toolbox fits within current legislation and other frameworks/plans.



1.1

Scope

This concept paper is designed to be a guide for the Manawatū-Whanganui CDEM response to a large earthquake and tsunami. It has used a credible magnitude 8.9 earthquake and tsunami planning scenario as a tool to aid planning. While many of the arrangements in this plan may be applicable to a range of events, there may be some requirement to modify or develop new arrangements for some events.

1.2

Legislative arrangements

The initiation of any response will be supported by several key pieces of New Zealand legislation:

- Civil Defence and Emergency Management Act 2002
- Health and Safety in the Workplace Act 2017
- Fire and Emergencies Act 2017
- Police Act 2008

1.3

Supporting plans and documents

This paper is reliant upon other plans to be enacted in support. This includes arrangements for coordination, evacuation, welfare provision and lifeline utilities. The following plans should be used to support the implementation of this response plan:

- Manawatū-Whanganui CDEM Group Tsunami Strategy and Action Plan
- Manawatū-Whanganui CDEM Group Plan
- Manawatū-Whanganui CDEM Group Recovery Plan
- Manawatū-Whanganui CDEM Group Community Resilience Strategy
- Manawatū-Whanganui CDEM Group Community Engagement Strategy
- Horizons Regional Council Emergency Response Manual
- Horizons Regional Council One Plan (Chapter 9)
- Palmerston North City Council Civil Defence procedures
- Horowhenua District Council Civil Defence procedures

- Manawatū District Council Civil Defence procedures
- Rangitikei District Council Civil Defence procedures
- Ruapehu District Council Civil Defence procedures
- Tararua District Council Civil Defence procedures
- Whanganui District Council Civil Defence procedures
- Manawatū-Whanganui Regional Fuel Plan
- Proposed National Earthquake and Tsunami Response Framework

1.4

Audience

This plan is intended to provide response guidance to the following audience:

- Manawatū-Whanganui CDEM Group Members, namely:
 - Palmerston North City Council
 - Horowhenua District Council
 - Manawatū District Council
 - Rangitikei District Council
 - Ruapehu District Council
 - Tararua District Council
 - Whanganui District Council
 - Horizons Regional Council
 - The Emergency Services
 - Mid Central District Health Board
 - Whanganui District Health Board
 - Regional Welfare providers
 - Government agencies including; New Zealand Transport Agency (NZTA), Ministry of Business, Innovation and Employment (MBIE), Ministry of Primary Industries (MPI), Department of Corrections
 - Lifeline utility providers
 - Iwi within the Horizons Region (see list [here](#)) and other Tangata Whenua (Including post-settlement Groups)

1.5

Review

This concept paper will inform the proposed National Emergency Management Agency National Earthquake and Tsunami Response Framework. Nevertheless, depending on national framework progress this paper may

be reviewed every five years, or as necessary, should any information regarding the implementation of any aspects of the response contained within change.

1.6

Exercising

This document will be exercised as part of the review process to ensure that the arrangements contained can be effectively implemented as required.

1.7

Response assumptions

In order to enable effective planning several assumptions have been made regarding coordination of the event at a national level, availability of resources, the ability to respond and the activities of the community. The core assumptions regarding this event are listed below. A more detailed description of these assumptions is shown in Appendix 1.

- The process of declaring local states of emergency will be initiated immediately.
- A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.
- CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.
- The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.
- Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.
- Local Government within the North and South Island will continue to operate but with reduced capacity and capability
- Responding agencies will be functional but operating with reduced capacity and capability
- Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.
- Standard communications will be limited, where available, alternate communications will be used
- Lifeline utilities will be limited or unavailable in the five CDEM Groups.
- Movement corridors will be affected, and many roads will be unusable
- Rail will be inoperable within the five CDEM Groups
- Airports may suffer earthquake and tsunami damage.
- Ports will be impacted by the earthquake and tsunami.
- Health and welfare services will be overwhelmed.
- Communities will be isolated.
- Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.
- Depending on the time of day significant numbers will be displaced from their home locations.
- The community led and Tangata Whenua response will work to meet communities immediate and basic needs where possible.
- Ordered mass-evacuation will not automatically occur.
- There will be significant and long-term environmental impacts.
- National and regional assembly areas will be established in accordance with national and regional plans.
- Offers of international assistance will be made and coordinated through the NCMC.
- Support from the (New Zealand Defence Force) NZDF (Linton/Ohakea/Waiouru) will be directed by NDZF and may not be an immediate resource available to the Manawatū-Whanganui CDEM Group



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 2

REGIONAL CONTEXT



MANAWATU-WANGANUI
EMERGENCY MANAGEMENT GROUP

2.0 Regional overview

Population

The region of Manawatū-Whanganui is in the lower North Island of New Zealand and has exposed coastline on both the east and west coasts of the region. The region has two main centres of population in Palmerston North and Whanganui. The region has a population of approximately 238,797 (NZ Census data 2018) with around 2.5% of the regional population living within the tsunami evacuation zones. Most of the population lives inland, with approximately 85,000 people living in Palmerston North and the surrounds and the remainder of the population spread across the remaining six district council areas. Approximately 20% of the population is aged under 14 years of age. 13% of the population in Manawatū-Whanganui is aged 70 or more.

Estimated totals of populations and dwellings within Whanganui tsunami evacuation zones are as follows:

Parameter	Estimated totals within Whanganui tsunami evacuation zones
Population	7,258
School population (children and staff)	885
Number of dwellings	1,691

Please note that in addition to the estimated totals above, there are other coastal settlements on the east and west coast of the Horizons region likely to be affected by tsunami inundation which are not accounted for in the figures above.

Local Government

The region has seven territorial authorities and one regional authority, as shown below:

- Palmerston North City Council
- Horowhenua District Council
- Manawatū District Council
- Rangitikei District Council
- Ruapehu District Council
- Tararua District Council
- Whanganui District Council

- Horizons Regional Council

Economy

The primary industries within the region are manufacturing and agriculture, which make up almost 20% of the regional GDP.

Lifelines

The region is served by four main state highways and several interconnecting state highways. These are detailed below:

State Highway (SH)	Main connections
SH1	North to Taupo / Hamilton (Waikato) South to Wellington
SH2	Running through the SE of the region, from Hawke's Bay to Wellington via Dannevirke
SH3	North West to New Plymouth (Taranaki)
SH4	North to Hamilton (Waikato) via Taumarunui
SH43	Connects Waikato to Taranaki via Taumarunui in north of the region
SH41	Connects Taupo to Taumarunui
SH47 (SH46)	Connects National Park (SH4) to Turangi through either SH47 or SH46 (branch of SH47)
SH49	Connects SH1 to SH4 – Waiouru to Horopito via Ohakune
SH 54, SH56, SH57	Connect Palmerston North to SH1 North and South

In addition to road connectivity, the region has a small seaport in Whanganui, and regional airports in Palmerston North and Whanganui. There is also an additional military airbase at Ohakea. Rail links connect the region to Auckland via Hamilton travelling north, Hawke's Bay in the East and Wellington in the south.

Electricity is supplied by major high voltage lines from the North and South of the region. The region also contains nationally significant electricity assets including the Bunnythorpe sub-station and several high-pressure gas pipelines.

2.1 Planning scenario overview

A credible planning scenario, developed by GNS Science (Power et al., 2018), has been used as a tool to develop the HRP Toolbox and this Regional Response concept papers. A high-level overview of the scenario is provided in the sections below. For further detail, refer to Volume I of the HRP Toolbox, Appendix A for the full scenario.

The earthquake

The planning scenario starts with a magnitude 8.9 earthquake on the southern portion of the Hikurangi Subduction zone (Figure 1.1). This is a realistic large earthquake that would impact most of the subduction zone and is slightly lower than the maximum plausible magnitude of Mw 9.0.

Shaking in the Manawatū-Whanganui region would be severe, between 8 and 9 on the modified Mercalli scale (MMI) in the east and lasting for over 40 seconds and between MMI 7 and 8 for the rest of the region and lasting between 20 – 40 seconds. Landslides across the region would also be severe as a result of the shaking, cutting off access into the region from some parts of the country.

Offshore the quake would cause widespread uplift of the seafloor right out the trench of around 2 – 2.5m. This uplift would result in the creation of a series of tsunami.

It is likely that significant aftershocks would continue for many weeks and months after the initial event, with some aftershocks exceeding Mw 7.0 and possibly requiring sustainment of exclusion zones or further evacuations of the population.

The tsunami

The earthquake would create a series of tsunami waves with average run up heights of 7 – 10 metres and exceeding 20 metres in some localised areas on the east coast of the Manawatū-Whanganui region. Offshore on the east coast waves exceed 5m in height. Inundation along the eastern Manawatū-Whanganui coast would be extensive, with flow depths of over 5 metres near to the

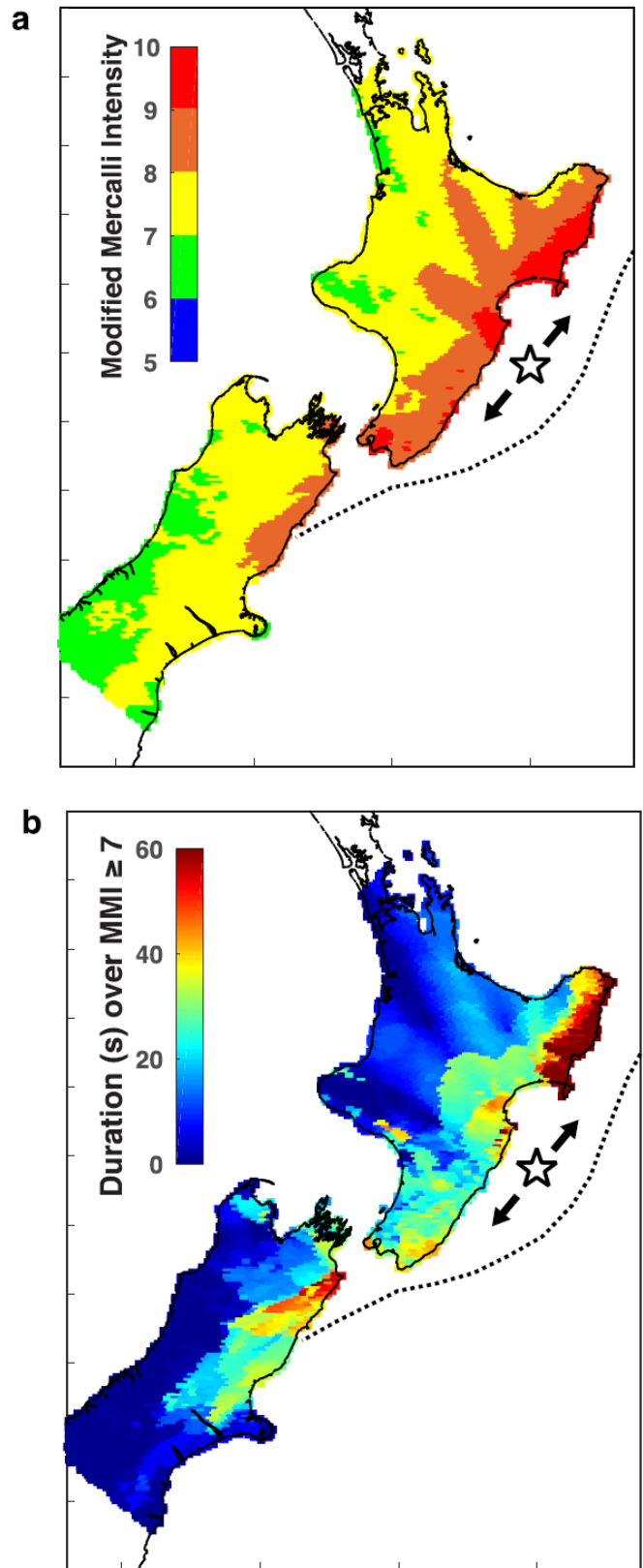


Figure 1.1(a, b): Modelled shaking intensity(a) and duration (b) for the credible planning scenario (Power et al., 2018).

coast and in some low-lying areas, but averaging 1 – 2.5 metres across any exposed areas.

Along the western coast of the region the impacts of the tsunami would be less severe. Wave heights would be far less and unlikely to cause significant inundation along the majority of the coast. Offshore wave heights would reach up to 2 - 3 metres and inundation would likely be experienced in low-lying coastal areas and around the Whanganui township.

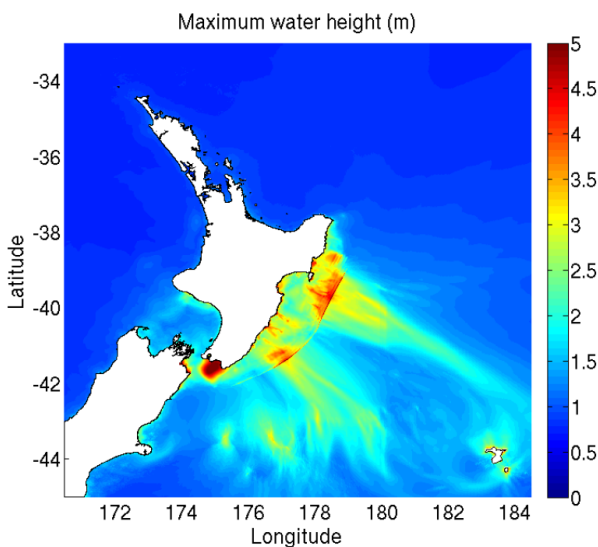


Figure 1.2: Modelled offshore water heights for New Zealand in the credible scenario (note, the scale is limited) (Power et al., 2018).

The impacts

Population

Widespread evacuation of coastal areas in the region would occur inland and to areas of high ground. Landslides and infrastructure damage would make it difficult for some areas to easily evacuate post-quake.

The impacts of a Hikurangi earthquake and tsunami event would be potentially severe for the population of Manawatū-Whanganui. The earthquake would likely cause some fatalities and numerous casualties with varying degrees of severity. The tsunami would be less likely to cause injuries or fatalities. Hundreds of people would be unable to return to their homes throughout Manawatū-Whanganui with many more thousands only having access to basic shelter and no access to utilities.

Built environment

The Manawatū-Whanganui Lifelines Project (2016) lists the following critical assets as being at risk within local tsunami inundation risk areas:

- Electricity substations in Whanganui
- Wastewater treatment plants in Foxton and Koitiata
- Trunk telecommunications fibre cables crossing coastal bridges
- Local roads within tsunami inundation risk areas
- SH 3 network bridge across the Whanganui River

Widespread landslides and liquefaction across the region would result in damaged roads and infrastructure. There would be widespread tilting of buildings on their foundations and some building collapse within the Palmerston North CBD and moderate damage to other buildings within the region as a result of the earthquake.

In addition, there may be some minor impacts to buildings in coastal areas as a result of inundation.

The state highway network would be impacted by the earthquake, with landslides, subsidence, bridge damage. The region would still be accessible from some areas, although it's likely that the east of the region would be cut-off from the west due to the likely impacts of the earthquake upon SH2 between Palmerston North and Taranaki.

The Port of Whanganui would probably still be operable, although there may be some damage from the earthquake and some debris from the tsunami.

The Palmerston North Airport would be unaffected by the tsunami but may be damaged by the earthquake. It would still be usable to receive aircraft and helicopters following structural assessment. The Whanganui Airport may be damaged by the earthquake but would still be useable following structural assessment. Ohakea Airbase would potentially be damaged by the earthquake but would still be useable following structural assessment.

Rail links into the region from the north, south and east would all be heavily impacted and unlikely to be restored for several months.

Electricity, water and sewerage would all be extensively damaged as a result of the quake requiring weeks to months to repair. Telecommunications would be mostly unusable for at least two weeks. The gas network would also suffer damage and be inoperable for an extended period.

Alternative Scenarios

Several other scenarios were modelled to show the potential impacts to the region. These are shown in the GNS Science report. They included modelling a rupture of

the fault further north from the above scenario, varying the slip distribution and a scenario focussing on a rupture in the area of strong coupling to the south of the Hikurangi zone.

In the alternative scenario modelled on a significant rupture in the south of the subduction zone (the area of strong coupling), the Manawatū-Whanganui region's west coast is significantly impacted by both the earthquake and the tsunami.

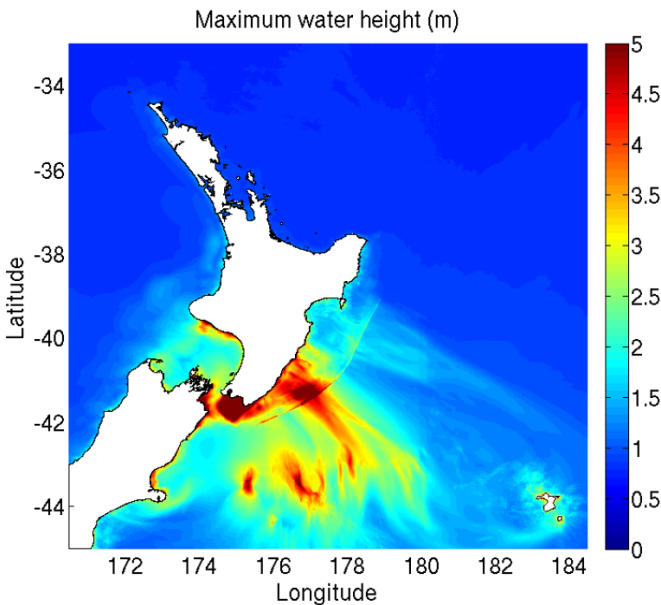


Figure 1.3: Scenario E modelled water heights for a rupture in the southern fault area of strong coupling (Power et al., 2018).

The impacts of the above scenario would likely result in far more damage from tsunami inundation along the west coast of the Manawatū-Whanganui region. The west coast would experience the first tsunami wave impacts far sooner than the main scenario.

Population

It is very likely that there would be additional fatalities and injuries to the population on the west coast due to the inundation of coastal settlements by the tsunami. This would potentially result in additional damage to housing, resulting in a larger number of displaced people requiring assistance.

Built environment

The coastal road network (including SH3) and assets such as bridges may be damaged by the inundation resulting in further isolation of coastal communities.

In addition, other assets within the tsunami zones, such as electricity, 3 waters and telecommunications, will be severely impacted and will require significant amounts of time to re-instate beyond those stated for the main scenario.

The Whanganui airport would potentially become unusable due to inundation. The Whanganui Port would also be unusable due to debris and damage to port infrastructure as a result of the tsunami inundation.

Scalability

Please note that the response activities and objectives contained within this plan are designed to be scalable to a range of Hikurangi earthquake and tsunami scenarios for the Manawatū-Whanganui CDEM Group, noting the planning scenario is only one of many possible scenarios which could occur on the Hikurangi subduction zone.



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 3

RESPONSE ARRANGEMENTS



MANAWATU-WANGANUI
EMERGENCY MANAGEMENT GROUP

3.0

Response arrangements

Initiation of response

The initiation of a response will be as a result of a long or strong earthquake occurring. Initially it will be unknown if the earthquake is associated with the Hikurangi subduction zone and therefore if a tsunami has been created.

Group Controller's Intent

To immediately initiate a coordinated, timely response to minimise loss of life and prevent escalation of suffering. Provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles.

This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

Limiting factors

The following factors may limit the Manawatū-Whanganui CDEM Group's ability to implement the activities detailed within each of the response phases:

1. Estimated time of arrival for first wave

The first waves from a major Hikurangi event would be expected to arrive on the east coast around 10-20 minutes after the earthquake occurs. This will leave minimal time for self-evacuation activities and no time for more formal evacuation arrangements to be implemented.

2. Liquefaction and subsidence

Widespread liquefaction and subsidence will cause issues with access into and out of areas and may make some areas inaccessible for several days.

3. Landslides

A result of the earthquake will be widespread landslides across the region, which may make some parts of the region temporarily inaccessible.

4. Resource availability

The impacts of the earthquake and tsunami may make resources scarce until supply lines can be established from outside the region. Lack of resources (perceived or real) may result in panic buying or looting.

The Horizons region will be reliant on fuel re-supply from the north (dependent on the availability of the road network) and so fuel, until re-supply is established and secured, may become a critical resource requiring coordinated management within the region (Please refer to Manawatū-Whanganui CDEM Group Fuel Plan)

5. Lifeline utility damage

Lifeline utilities will be extensively damaged as a result of the event adding complexity to the ability to carry out response activities and establish a coordinated response. Note also that many Lifeline agencies rely on the availability of contractors for response activities. Note also that many of the Lifeline agencies rely on the availability of contractors for response activities

6. Continued risk of tsunami

The risk of tsunami will continue for up to 24hrs after the initial wave has impacted. There will also be risk of further tsunami with any significant aftershocks. This will prevent some response activities from occurring until safe access to an impacted area can be established.

7. Continued risk of aftershocks

There will be a continued risk of large aftershocks occurring for many weeks and months after the initial event. These may cause further damage, result in the need for additional evacuations and potentially result in further tsunami events occurring.

8. Number of displaced persons

This event will potentially result in hundreds of people becoming displaced. Quick reconnaissance of where people have been displaced to will be required to ensure aid reaches all those in need. In addition, a number of the coastal settlements will no longer be inhabitable, and their populations displaced into the surrounding area.

9. Population returning to coastal areas in the West

Due to the likely length of time between the earthquake occurring and the first wave arriving in Whanganui (potentially 1hr +) the population who have self-evacuated along the settlements of the west coast may begin to return to the coast, as information on predicted wave ETA's will be difficult to communicate.

3.1

Roles and responsibilities

Organisation	Role and responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> • Ensure coordination of the response across partner agencies and responding organisations
Local EOCs	<ul style="list-style-type: none"> • Ensure coordination of the response locally
NZ Police	<ul style="list-style-type: none"> • Ensure public safety • Maintain law and order • Manage public movement • Lead Disaster Victim Identification (DVI) process, mass casualty teams, reporting deaths to the Coroner's office and provision of inquiry services for missing persons. • Lead the investigation of any large-scale fatalities to report on criminal responsibility (Please note this would not be a priority within the first 24hours) • Where mass fatalities occur as a result of a scenario which severely impacts the Bay of Plenty Region, NZ Police would be responsible for the establishment and management of mass fatality temporary morgue facilities on behalf of the Coroner. These internal Mass Fatality Morgue plans are already in place and were updated as a result of COVID-19. • Activate Business Continuity Plans
Fire and Emergency New Zealand	<ul style="list-style-type: none"> • Lead response to all fire and hazardous substance related issues, urban search and rescue activities and coordinate the rapid impact assessment process • Activate Business Continuity Plans
Mid Central / Whanganui DHB	<ul style="list-style-type: none"> • Ensure provision of hospital and key health services within the region • Activate Business Continuity Plans
St. John Ambulance	<ul style="list-style-type: none"> • Provide rapid response medical care as required and transportation of injured persons to health facilities. • Activate Business Continuity Plans
Local Authorities	<ul style="list-style-type: none"> • Ensure staff are trained to support response both regionally and locally. • Ensure provision of core services including key lifeline utilities. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
Welfare Agencies	<ul style="list-style-type: none"> • Ensure the provision of welfare services to persons impacted by the event as required. • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
Lifeline Agencies	<ul style="list-style-type: none"> • Ensure the provision of core lifeline services to the region to the maximum possible extent. • Activate Business Continuity Plans
Iwi	<ul style="list-style-type: none"> • Provide cultural and communications advice regarding the response to Tangata Whenua within the region • Coordinate links to Māori communities to provide key emergency information and status reports

	<ul style="list-style-type: none"> • Activate Business Continuity Plans and continue to provide essential services even if at a reduced level
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3.2

Coordination arrangements

In the early stages of any response there will be difficulty coordinating the activities of responding agencies until an appropriate command and control structure can be implemented.

Response structure

The Manawatū-Whanganui CDEM Group will endeavour to establish the Manawatū-Whanganui CDEM Group ECC response structure according to the Coordinated Incident Management System (CIMS).

Establishing response facilities

It is highly likely that some key response facilities of core agencies will be heavily impacted by the event. The key response facilities that will be established as soon as practicable are listed below.

Establishment of these facilities will be dependent upon accessibility, structural safety and access to key equipment, resources, and lifeline services such as emergency power.

Response Facility	Location
Group Emergency Coordination Centre (GECC)	Te Ao Nui, 17-23 Victoria Ave, Palmerston North 4442
Palmerston North EOC	Te Ao Nui, 17-23 Victoria Ave, Palmerston North 4442
Whanganui EOC	Whanganui District Council, 101 Guyton Street, Whanganui 4500
Ruapehu EOC	Ruapehu District Council, 59-63 Huia Street, Taumarunui 3920
Horowhenua EOC	Horowhenua District Council, 126/148 Oxford Street, Levin 5510
Manawatū EOC	Manawatū District Council, 135 Manchester Street, Feilding 4702
Rangitikei EOC	Rangitikei District Council, 46 High Street, Marton
Tararua EOC	Tararua District Council, 26 Gordon Street, Dannevirke 4930
Civil Defence Centres (Centres to be named and location advised over local radio)	Whanganui District Council: https://www.whanganui.govt.nz/Services-Amenities/Civil-Defence-Emergency-Management/Civil-Defence-Centres
	Palmerston North City Council https://www.pncc.govt.nz/services/emergencies/civil-defence-centres/
	Ruapehu District Council To be named following event over local radio
	Horowhenua District Council

	To be named following event over local radio
	Manawatū District Council To be named following event over local radio
	Rangitikei District Council https://www.rangitikei.govt.nz/services/civil-defense-emergency/civil-defence-centers
	Tararua District Council To be named following event over local radio



Figure 3.0:
 Manawatū-Whanganui
 CDEM Group
 response facilities

3.3

Response Phases

Three response phases have been used to describe the outcomes, actions and core response activities following a large Hikurangi event. The response phases cover:

- **Phase 1 (Immediate response)**

The immediate response, where emergency services are reacting to the earthquake and tsunami which has just occurred – this phase is dominated by activities which enable lifesaving and life preservation.

- **Phase 2 (Initiation of sustained response)**

The gap between the immediate, uncoordinated response and one that starts to become self-sustaining. During this phase, response agencies have interim operating capability.

- **Phase 3 (Sustained response)**

A self-sustaining response bolstered by domestic and/or international resources where required. All responding entities are at full operating capacity and capability

Event timeline

	Event	Outcomes/Actions	Core response activities
Phase 1	Earthquake occurs	<ul style="list-style-type: none"> • Mainshock causes extreme damage across the Manawatū-Whanganui region and wider East Coast of New Zealand including building collapse. • Coastal populations begin self-evacuating inland and to higher ground in un-coordinated fashion. • Some evacuation routes are severely damaged, and people are unable to easily move to safety. • Emergency Services direct people to evacuate whilst moving key assets to safe locations and inland. • Electronic national warnings issued for tsunami, however due to lifeline damage from the mainshock, are not able to reach most of the Manawatū-Whanganui population. 	<ul style="list-style-type: none"> • Alerts and notifications • Warning and informing (Public) • Self-evacuation and life safety activities • Response activation and mobilisation • Establishing communications.
	First tsunami reaches shore	<ul style="list-style-type: none"> • Landslides and liquefaction have occurred across the region. • First tsunami wave has reached the east coast shore and inundation of low-lying areas has begun. • Population on both coasts are continuing to self-evacuate. 	
	Major inundation from first wave	<ul style="list-style-type: none"> • Major inundation from tsunami now occurring along east coast of Manawatū-Whanganui region. • Some of the population has been unable to move to safety, others are still in the process of evacuating. 	
	Displaced population arriving in safe areas	<ul style="list-style-type: none"> • Community unsure of what to do. Spontaneous first aid and assistance provided by locals with resources at hand. 	

		<ul style="list-style-type: none"> • Emergency Services carry out initial actions plans, responding to immediate needs of those in safe areas and triaging medical assistance. • USAR and general rescue operations activities begin with in situ regional resources. • Evacuation of status 1 casualties begins. • Rapid impact assessments carried out in safe areas. • Response staff in affected areas check on their families. • Community-led response begins. 	
	Manawatū-Whanganui CDEM Group activate response	<ul style="list-style-type: none"> • Key staff alerted and begin travelling to the GECC where able. • District and City councils establish EOC's to coordinate the local delivery of response activities. 	
	Basic communications established	<ul style="list-style-type: none"> • Basic VHF communications is established between key agencies. • Information gathering begins, however, there is limited situational awareness. 	
Phase 2	Delivery of rapid relief	<ul style="list-style-type: none"> • Community efforts to provide rapid relief to displaced and impacted persons bolstered. • Community halls, marae, schools and sports facilities opened to provide shelter and basic needs. 	<ul style="list-style-type: none"> • Providing Rapid Relief • Developing situational awareness, Managed evacuative and exclusion, Operational planning • Management of resources.
	Tsunami activity subsides, aftershocks on-going	<ul style="list-style-type: none"> • Rapid impact assessment undertaken in areas where inundation has occurred. • Emergency Services begin responding to immediate needs of those within the areas impacted by tsunami who have survived. • Ongoing aftershocks have the effect of pausing response activities, recommencing when risk of further tsunami assessed. 	
	Basic situational awareness gained	<ul style="list-style-type: none"> • CDEM Initial action plan developed. • Resources coordinated and deployed to priority areas. • Evacuation of other casualties as required begins, and as transport is available. • Identification of additional resource shortfalls and requests for support to NCMC begins. • Coordinated impact assessment begins. 	
	Surge support arrives	<ul style="list-style-type: none"> • Some international and domestic assistance starts to arrive but it is limited because of wide spread damage especially in North Island (Note the recipient CDEM Group may need to provide accommodation for some of the external response personnel). • Preparation of Regional Assembly Areas begin. • USAR operations increase, with deployment of additional international teams into affected areas. 	

Phase 3	Welfare coordination established	<ul style="list-style-type: none"> • Pre-identified CDC's activated to meet basic needs of population. • Basic needs assessment process is conducted. 	<ul style="list-style-type: none"> • Coordinated welfare delivery • Restoration of essential lifeline services • Supporting community response and engagement • Debris and Environmental Management.
	Supply chains established	<ul style="list-style-type: none"> • Supply of essential goods into the region occurs via air to Palmerston North and Whanagnui Airports and Ohakea Military Airbase. • Supermarkets and spontaneous 'hubs' (e.g. general stores with household items such as clothes) controlled by CDEM to ensure supplies are managed. 	
	Basic lifeline utilities re-established in inland areas	<ul style="list-style-type: none"> • Electricity is available to some parts of the region. • Basic mobile phone connections are re-established inland. • Water supply is restored to some areas. 	
	Community response supported	<ul style="list-style-type: none"> • Community initiatives supported with resources. 	
	Sustained response activities occurring	<ul style="list-style-type: none"> • On-going welfare needs of the population are met including food supply and medium-term accommodation for displaced persons. • Lifelines are continuing to be restored in impacted areas. • Communication is improving. • Supply chains are improving, and increased resources are arriving to support the response. • Environmental clean-up occurring. 	

3.4

Phase one- immediate response activities

Phase 1 response priorities

The following priorities exist for Phase 1 of the response:

- Conduct life safety activities
- Protect key resources needed for response
- Establish response coordination arrangements

Alerts and notifications

The natural warning signs (A long OR strong earthquake) will be the main alert to a major event occurring for all agencies. Given the nature of the event it may not be possible for the Manawatū-Whanganui CDEM Group office to issue a regional warning, however, they should still endeavour to do this from a safe location, as it may still be received by some.

In addition to this alert it is assumed that a national warning will have been issued via the Emergency Mobile Alerting system and that this has been received where there is still capability in the communications networks (e.g. battery backup to cell phone towers).

As the event progresses alerts may need to be issued via other methods such as VHF and satellite communications.

Core objective:

To ensure that responding agencies within the region are alerted to issues relating to the event

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> • Use alerting methods, e.g. EMA system or alternate comms, to ensure responding agencies remain informed
All other agencies	<ul style="list-style-type: none"> • Ensure that alerts and notifications are disseminated to all key staff

Warning and informing (Public)

Due to the nature of the event warning and informing the public may not be possible across many platforms.

In the early stages of the event (Immediately after the initial earthquake has occurred) there would be a reliance upon the population acting based on the long or strong messaging that is used to promote natural warning signs.

There may be limited phone signal as a result of the quake, but it must be assumed that a national warning would be put out using the Emergency Mobile Alerting platform and where the capability was still operational this could be received by anyone with a mobile phone.

As the event progresses other platforms for communicating with the public may start to become available with the restoration of communications, however, during Phase 1 and 2 of the response communicating will be restricted.

The Manawatū-Whanganui CDEM VHF network may still be operational following the quake and could be used in the first instance to communicate with impacted communities where radios exist. This will be reliant upon VHF radios in the communities being switched on and able to operate effectively.

Core objective:

To ensure the timely provision of key emergency information to people impacted by the event

Agency	Responsibility
Manawatū-Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Coordinate the provision of emergency information to the community across all available platforms
All other agencies	<ul style="list-style-type: none"> • Ensure key emergency information is provided to the community in coordination with the Manawatū-Whanganui CDEM Group and Local CDEM PIM Functions

Self-evacuation and life safety activities

It is assumed that there will be self-evacuation from coastal areas following the earthquake and this will be strongly encouraged in any warnings that are issued. However, it is extremely likely that there will be severe congestion, and some may be unable to evacuate to safety in time due to damage as a result of the earthquake, or their distance from a safe area. All efforts should be made by responding agencies to assist people to evacuate while ensuring that critical staff and resources are evacuated to safety to support the response.

The preceding earthquake is likely to cause considerable damage within the region resulting in injuries and deaths. Initial focus for life safety activities should be directed towards those who have evacuated to a safe area or have been impacted by the event in areas away from the coast. Once it is safe to do so, and there is reduced risk to personnel and assets, the focus of life safety activities will move to those impacted by both the earthquake and the tsunami near to the coast.

Core objective:

To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction

Agency	Responsibility
Manawatū-Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Provide clear direction with regards to safe zone locations and evacuation routes
NZ Police	<ul style="list-style-type: none"> • Direct people to evacuate from areas at risk of inundation • Support traffic management where safe to do so
Fire and Emergency New Zealand	<ul style="list-style-type: none"> • Coordinate USAR activities in impacted areas as the situation allows

St. John Ambulance	<ul style="list-style-type: none"> • Provide medical assistance to those impacted by the event as the situation allows • Support FENZ with USAR activities by providing medical assistance • Transport injured persons to healthcare facilities
Mid Central / Whanganui District Health Board	<ul style="list-style-type: none"> • Ensure capability to meet the medical needs of the impacted population

Response activation and mobilisation

In the initial phase of the event responding organisations will be utilising existing SOPs to respond accordingly. However, in order to ensure coordination across all agencies there will be a need to establish response facilities and mobilise personnel and resources to carry out key response activities.

The process of activation and mobilisation may be made extremely difficult by the lack of communications and accessibility of facilities. It is also highly likely that some staff and resources will have been lost due to their location at the onset of the event. In addition, severely damaged coordination facilities will require structural assessment by a suitably qualified building inspector before re-occupation.

Focus should be placed on ensuring the Group ECC is activated as soon as possible to provide a base for the coordination of the response. In addition, local EOC's should be established as soon as practicable to direct the response at the local level. The emergency services should focus on establishing a Base of Operations to manage the on-going life safety activities.

Core objective:

To activate appropriate response facilities to enable coordination of the response at all levels

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the GECC Support key staff to access the GECC facility as required
Local EOC's	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the EOC Support key staff to access the EOC facility as required
Emergency Services	<ul style="list-style-type: none"> Activate response facilities, mobilise resources to respond and provide liaison to the GECC

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Ensure the operability of the Manawatū-Whanganui CDEM Group VHF Network to support communication between responding agencies Deploy satellite communications to enable communication with local EOC's, the NCMC and the Emergency Services
All other agencies	<ul style="list-style-type: none"> Ensure operability of VHF and satellite communications equipment to enable communication between the GECC and all responding agencies and internally with key response staff

Establishing communications

The ability to communicate between responding agencies and on the ground between responders is critical to enabling a coordinated and effective response to the impacts of the event. It is highly likely that the standard form of communication normally used will either be severely compromised or completely inoperable (e.g. landline and mobile phone networks, internet) and therefore other methods will need to be utilised.

The core focus in the initial phase of the response should be on utilising the Manawatū-Whanganui CDEM VHF network to establish communications between agencies. Individual agencies may still be able to use their own VHF network to communicate internally. In addition, the Manawatū-Whanganui CDEM GECC should utilise the satellite communications equipment available to establish connections to local EOC's, the NCMC and support other response activities.

Core objective:

To establish appropriate communication to enable coordination of the response and information sharing between key agencies

3.5

Phase two- initiating sustained response activities

Phase two response priorities.

The following priorities exist for Phase 2 of the response in Manawatū-Whanganui:

- Ensure immediate needs of the population are met
- Gain situational awareness
- Prioritise and manage resources

Providing rapid relief

Providing rapid relief in the early stages of the event is critical to ensuring that people can get through the initial impacts. Rapid relief includes food, water, shelter, and urgent medical needs.

This event is likely to require rapid relief provision to many thousands of people. The provision of rapid relief is likely to be hampered by the dispersed population and the access to resources. In the initial phase of the response the rapid relief provided may be extremely basic and rely heavily upon the community to support the effort until

more coordination can be established and appropriate resources deployed.

Core objective:

To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses, marae etc)
Local EOC's	<ul style="list-style-type: none"> Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event
Welfare Providers	<ul style="list-style-type: none"> Ensure provision of rapid relief in support of the GECC and Local EOC's

Developing situational awareness

Gaining a clear understanding of the event and ensuring that all responding agencies have a shared understanding of what has happened is vital to enabling clear and effective decision making. In the early phase of the response developing situational awareness will be made difficult due to the lack of communications, restriction on movement due to road damage, potential loss of personnel and ability to establish response facilities.

Initial situational awareness may come from responders attending facilities and their observations of the event and the impacts. As the response progresses and communications are established between responding agencies coordinated impact assessments may begin to occur. These may be rapid impact assessments (general ground observations of the situation) in the first instance, but as time allows these will become more detailed and include street by street damage assessments, welfare assessments and lifeline asset damage assessments. As

the event progresses the situational awareness of all agencies should increase enabling more targeted response efforts in the worst impacted areas. For the development of situational awareness to be effective it is critical to establish clear communications between responding agencies as soon as possible to enable status reporting to the GECC and ensure that key information is disseminated to all agencies.

Core objective:

Develop a clear understanding of the impacts of the event as soon as possible to support decision making.

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies
Local EOC's	<ul style="list-style-type: none"> Lead the welfare impact assessment process Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city
Fire and Emergency NZ	<ul style="list-style-type: none"> Lead the rapid impact assessment process and coordinate the collection of information by other emergency services Provide regular status reports to the Manawatū-Whanganui CDEM GECC
NZ Police	<ul style="list-style-type: none"> Support the rapid impact assessment process Provide regular status reports to the Manawatū-Whanganui CDEM GECC
St. John Ambulance	<ul style="list-style-type: none"> Support the rapid impact assessment process Provide regular status reports to the Manawatū-Whanganui CDEM GECC
Mid Central /	<ul style="list-style-type: none"> Support the rapid impact assessment process

Whanganui DHB	<ul style="list-style-type: none"> • Provide regular status reports to the Manawatū-Whanganui CDEM GECC
Local Authorities	<ul style="list-style-type: none"> • Conduct building damage assessments • Conduct utility damage assessments
Welfare Agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process • Provide regular status reports to the Manawatū-Whanganui CDEM GECC
Lifeline Utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments • Provide regular status reports to the Manawatū-Whanganui CDEM GECC

Managed evacuation and exclusion

As situational awareness increases and there is more ability to respond in impacted areas, evacuations and exclusions may need to be implemented to prevent further risk to the population. This may be as a result of additional risk from the impacts (e.g. landslide risk, health risks etc) or to enable response activities to occur without risk to people in the area.

Evacuation of an area will require a door-to-door approach to be taken, as it is most likely that communications will be extremely limited in the early phases of the response. In addition, the resources to conduct managed evacuations are likely to be extremely limited.

Exclusion from areas will be required to prevent people returning where there is an increased risk or to maintain security until residents are able to return. The establishing of cordons may not be possible in the early phases of the response until appropriate resources become available and may not be possible at all in some areas due to the logistical requirements.

Core objective:

To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so

Agency	Responsibility
Manawatū-Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police
NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by the Manawatū-Whanganui CDEM Group • Establish cordons and exclusion zones

Operational planning

In the initial phase of the response most activities will occur based on existing SOPs and plans of each agency. While some of the activities will have a level of coordination on the ground, there is likely to be some duplication of effort and confusion in exactly what needs to happen and a higher level of planning required to enable coordination across the entire response.

Initial action plans for the event are likely to be very basic and lack detail due to the limited information and scale of the event (See appendix 2, pg.41 for a draft event action plan). Operational planning can only begin to occur once clear communication has been established between agencies and there is a reasonable level of situational awareness regarding the impacts of the event and the issues that require response.

Core objective:

To ensure a coordinated response through a consolidated planning process across all responding agencies

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the Manawatū-Whanganui CDEM Group Action Plan
Local EOC's	<ul style="list-style-type: none"> • Coordinate the development of local action plans to ensure the delivery of

	the Manawatū-Whanganui CDEM Group action plan
All other agencies	<ul style="list-style-type: none"> Contribute to the development of the action plan by identifying key tasks, issues and resource requirements

Management of resources

Due to the extent of the impacts, resources to respond are likely to be severely impacted. Careful management of these will be required at an early stage to ensure that priority issues can be responded to effectively.

In order to manage resources effectively, the Manawatū-Whanganui CDEM Group will first need to understand what resources have survived the event and are available to respond. It will be critical for all responding agencies to identify their available resources at an early stage and provide this information to the Manawatū-Whanganui CDEM GECC so that resources can begin to be used in the most effective way. Any critical resources need to be identified and prioritised for use or requested from the NCMC if not available in the region.

There is also likely to have been significant damage to supply lines and retail outlets, such as supermarkets and fuel sources. Existing supplies within the region will need to be managed and prioritised to ensure these are used as effectively as possible until resources can be brought into the region.

Core objective:

To ensure the most effective use of all available resources in response activities.

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise available response resources Identify any critical resource needs and request from the NCMC if not available within the region
Local EOC's	<ul style="list-style-type: none"> Coordinate and prioritise the deployment of resources locally

All other agencies	<ul style="list-style-type: none"> Identify all available and critical response resources and provide to the Manawatū-Whanganui GECC
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3.6

Phase three- sustained response activities

Phase three response priorities

The following priorities exist for Phase 3 of the response in in Manawatū-Whanganui:

- Ensure on-going needs of the population are met
- Restore key lifeline services
- Support community response activities

Coordinated welfare delivery

The provision of welfare services to those impacted by the event will require coordination across multiple agencies and the community and will require significant resources to ensure people are able to manage through the event.

The region is likely to have displaced persons, including tourists, who have evacuated from the coast and cannot return to their homes. Potentially there could be hundreds of people displaced long term as a result of the event, with many more only able to shelter in their homes and having limited access to utilities. While some of these people may be able to stay with friends and family in areas not as heavily impacted, a large majority will be reliant upon help to find accommodation and meet their basic needs for an extended period of time. The supply of household goods and services will be a critical element of providing for the immediate and on-going needs of the population.

In addition, several areas of Manawatū-Whanganui will be cut-off from support due to infrastructure damage and may have to provide for their own welfare for several days until supplies can be taken in. Settlements in the east of the region are likely to be separated from the rest of Manawatū-Whanganui and critical supplies may need to

be brought in from Hawke’s Bay in order to support the needs of the population there.

Core objective:

To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services.

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event including the provision of resources from neighbouring CDEM Groups where applicable Ensure critical resources required to provide for on-going needs are prioritised
Local EOC's	<ul style="list-style-type: none"> Ensure and coordinate the delivery of welfare services locally
Welfare agencies	<ul style="list-style-type: none"> Support the provision of on-going needs as requested by the Manawatū-Whanganui CDEM Group Identify any critical resource needs to enable the delivery of key welfare services

Restoration of essential lifeline services

Lifeline utilities are likely to have been very heavily impacted as a result of the event. The information below provides an overview of the estimated damage the planning scenario could cause.

It is recommended regional response planning further quantifies and refines the likely damage to lifeline assets following a large Hikurangi event.

Energy

- 30 – 40% of power supply within the region initially lost
- Multiple gas leaks and breakages along the network resulting in a 30% reduction of capability

Water

- All three waters would be extensively damaged and would take weeks to months to repair or reconstruct

Telecommunications

- 80% of communications in the region would be lost and require several weeks to months to repair

Transport

- Many state highways would suffer damage from landslides and liquefaction, potentially isolating the region in some parts from neighbouring regions (e.g. SH2 to Hawke’s Bay).
- A number of key bridges along key routes would be damaged and require repair to re-instate.
- It is anticipated rail routes will be severely damaged as a result of the event, requiring significant repair to re-instate.

Port

- Whanganui Port may potentially suffer damage from the earthquake and tsunami debris, but following inspection is likely to be useable.

Airport

- All airports within the region (Palmerston North, Whanganui and Ohakea Airbase) are anticipated to be useable as long as not severely damaged by the earthquake.

Lifeline restoration priorities

In tandem to the prioritised repair of logistics enablers listed below; power, potable water and storm water supply restoration in areas where people are still able to live will need to occur as soon as possible to reduce dependency on services such as water tankers and emergency power generation.

All lifeline restoration is dependent on the availability of contractors, resources and access to lifeline assets. As these priorities are based on the planning scenario, please note they may need to be adjusted for the realised impacts of a future event.

1. Internal priority roads/access routes for emergency services:

In the early stages of the event, priority will need to be given to clearing access routes across the region to enable emergency response to occur and isolated populations access assistance.

2. Palmerston North Airport and Ohakea Airbase.

Any repairs or structural assessment required at the Palmerston North Airport and/or Ohakea should be prioritised to enable the inward movement of supplies and evacuation of critically injured persons from the region.

3. Inter-regional road connections with Hawke's Bay, Wellington, Taranaki and Waikato CDEM Groups

Key linkages with the Hawke's Bay (SH2) and Wellington regions (SH1) should also be prioritised for repair to enable the flow of goods (e.g. fuel, rapid disaster relief) and specialise response personnel between the regions.

4. Whanganui Port

Core objective:

Restore basic services to the community to the maximum possible extent.

Agency	Responsibility
Manawatū-Whanganui CDEM GECC	<ul style="list-style-type: none"> Coordinate and prioritise the restoration of lifeline services
Local EOC's	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so
Lifeline Utilities Agencies	<ul style="list-style-type: none"> Undertake the restoration of basic services to the community where possible to do so

Supporting community response and engagement

The community will play an integral part in the response and will be vital in ensuring that the wider community is able to manage through the impacts of the response.

In the early phases of the response it is highly likely the community will provide for the immediate medical and welfare of those impacted by the event. While this may be sustainable in the short term, it will require support from the Manawatū-Whanganui CDEM Group as supplies become limited or more expertise is required.

Communities are also likely to lead the response efforts in their area in terms of debris clearance and this will need to be supported by the Manawatū-Whanganui CDEM Group to ensure it occurs in a coordinated fashion and does not put anyone at risk.

Where possible, existing community groups should be utilised to provide information to the wider community and coordinate response efforts in their area.

Core objective:

Enable the community to lead the response effort where appropriate through the provision of resources and advice.

Agency	Responsibility
Manawatū-Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> Lead community engagement and provide supplies and resources to sustain community response efforts
All other agencies	<ul style="list-style-type: none"> Support community response efforts through provision of information, advice and resources

Debris and environmental management

The event will create a huge amount of debris, mainly from the earthquake. This is likely to require a large number of resources to clear and there will be a limited ability to separate any hazardous waste.

In the early phases of the response debris management may simply be piling up debris in place to clear access routes. Longer term, debris will need to be managed to ensure that hazardous substances and waste are cleared and stored where they pose no risk to human life. This may require the establishment of a specific facility to receive and sort waste and the development of additional landfill facilities within the region for disposal of the non-harmful waste. Hazardous and harmful waste will need to be transported to specific facilities outside the region but may need to be stored long term within the region before it can be disposed.

Core objective:

Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.

Agency	Responsibility
Local EOC's	<ul style="list-style-type: none"> Coordinate the collection, removal, and disposal of debris

3.7

Inter-regional response requirements

Working with neighbouring regions

The event will impact most regions in New Zealand, given the scale of the quake and generated tsunami. As a result, support from neighbouring regions may need to be sought to assist parts of the Manawatū-Whanganui region. This is most likely to be the case for the northern eastern part of the region, which will likely be cut-off from the remainder of the region, requiring the Hawke's Bay region to provide assistance.

It is most likely that Manawatū-Whanganui may also be requested to support some areas of neighbouring regions, in particular the norther parts of the Wellington region, which is likely to be separated from the rest of the region.

Requesting support

Requesting support from a neighbouring region will require discussion between the National Controller and the two Regional Controllers. Memorandums of Understanding (MOU's) created in readiness may facilitate this occurring more quickly in response.

The requirements for inter-regional support are discussed in Volume II of the HRP Toolbox.

Priority inter-regional information requirements

The following diagram shows the Manawatū-Whanganui CDEM priority inter-regional information requirements to enable the emergency response. These include the status of neighbouring CDEM Groups, and key logistics nodes (e.g. Port) and links (e.g. SHs) into the region and that link with the Horizons Region.

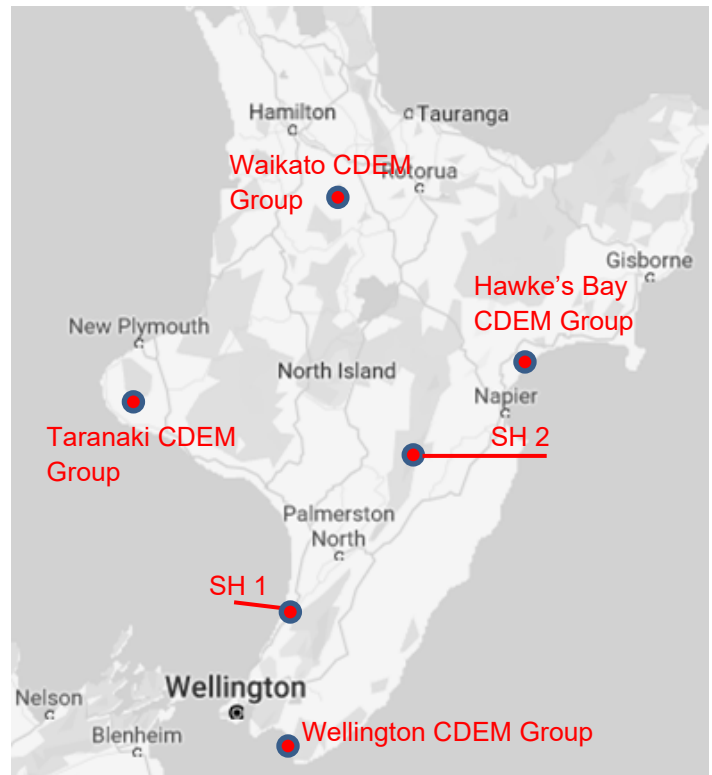


Figure 3.0: MWCDEM Priority inter-regional information requirements



EAST COAST LAB

HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 4

LOGISTICS & LIFELINES



MANAWATU-WANGANUI
EMERGENCY MANAGEMENT GROUP

4.0

Logistical requirements

A number of logistical requirements exist that will enable the region to effectively respond to the impacts of the event.

As part of regional response planning it is recommended logistical requirements for the response to a large Hikurangi event. are further scoped and refined

Priority sites, emergency power supply and emergency water supply

As part of the regional response planning process it is recommended the following logistical requirements are document:

Priority sites: Identify sites which are a priority to re-establish basic lifeline services to, to enable them to function as soon as possible following an emergency.

Emergency generators: Identify the owner and locations of emergency generators in the region to enable emergency power supply

Emergency water supply: Identify companies which may be able to assist with the provision of emergency water supplies

Key supply routes

The following state highways should be prioritised and re-established as soon as practicable to enable re-supply into parts of the region and from the north to the south of the country:

- State Highway 1
- State Highway 3 / 4
- State Highway 2 east and south

The Palmerston North Regional Airport and Whanganui Airport should be prioritised for restoration to enable the inward supply of resources from outside the region. These will most likely also be utilised as hubs to provide resources into neighbouring regions. Ohakea Airbase should also be prioritised for restoration to provide additional supply capability.

Communications

The following sites should be prioritised for repair to enable communications within the region:

Manawatu-Whanganui CDEM Group GECC and EOC locations

Further locations to be determined as part of the regional planning process

Fuel supply

Fuel supply in the Horizons Region will be dependent on the availability of;

- Fuel stations assessed to be 'safe' following the earthquake
- Generators to power fuel stations where power has been lost
- Inter-regional road connections for resupply into the region.

Where resupply and region fuel stocks are limited as a result of the earthquake, fuel may need to be managed by the CDEM Group as a critical resource to ensure there is enough to enable emergency response operations.

Supermarkets

Food and household good supplies (FMCG) in the Horizons Region will be dependent on the damage supermarkets sustain during the earthquake and following aftershocks. Where power has been lost, generators may be required for refrigerated goods.

Like fuel, where stocks and resupply of FMCG are limited as a result of the earthquake, FMCG may need to be managed by the CDEM Group as a critical resource for the population.



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 5

APPENDICES



MANAWATU-WANGANUI
EMERGENCY MANAGEMENT GROUP

Appendix 1: Response assumptions

Following a large Hikurangi event, it is assumed:

- **The process of declaring local states of emergency will be initiated immediately.**

A large Hikurangi event will have significant impacts on all five CDEM Groups. It is assumed local authorities and CDEM Groups affected will immediately initiate the process of declaring states of local emergency.

- **A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.**

It is assumed that a state of national emergency is likely to be declared within the first 24 hours of the response due to the scale of impact and the need for operational coordination of national resources in response to an emergency of this size. Ultimately, this is the decision of the Minister of Civil Defence, on advice of the National Controller and/or Director of Civil Defence Emergency Management.

Following declaration, the National Crisis Management Centre (NCCMC) will direct the overall response. The NCCMC will be situated in Wellington or at its secondary location in Auckland.

- **CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.**

A large Hikurangi event will significantly impact the five CDEM Groups. This will lead to a reduced level of operations immediately following the initial earthquake and subsequent tsunami impacts. It is not expected that the five CDEM Groups will be able to immediately activate and lead a coordinated response.

Each of the five CDEM Groups on the North Island East Coast have primary and secondary or mobile Emergency Coordination Centres (ECCs). Most Emergency Operations Centres (EOCs) have primary and secondary locations in each of the five Groups. The community, local, regional and multi-agency response will be led and coordinated from these centres including communication and coordination with other CDEM Groups and the NCCMC.

- **The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.**

The NCCMC will be functional but will initially be operating at reduced level. The NCCMC will be able to coordinate the national response in Wellington or from its alternative site in Auckland.

- **Initial tsunami threat maps are estimated to be produced by the National Geohazards Monitoring Centre (NGMC) within 20-30 minutes**

Following a large Hikurangi event it is estimated it could take approximately 20-30 minutes for the National Geohazards Monitoring Centre (NGMC) to make an initial assessment and relay initial threat maps to the NEMA duty team using alternate communications, e.g. satellite phone and BGAN, if necessary. The NEMA Duty Team would then pass this information onto CDEM Groups to inform decision making.

- **Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.**

A large Hikurangi event will impact Groups wider than those scoped by this framework. This framework does not assume the five CDEM Groups will receive any assistance from near or neighbouring CDEM Groups as it is likely they will be dealing with their own impacts. Depending on their capacity, CDEM Groups in lower South Island and upper North Island (e.g. Northland CDEM) may be available to assist those most affected. Offers and requests for inter-Group assistance will be coordinated by the NCCMC.

- **Local Government within the North and South Island will continue to operate but with reduced capacity and capability**

North and South Island authorities (local and territorial councils), will continue to operate but with reduced capacity and capability. Local government authorities, with regulatory oversight responsibility, will continue their same roles and responsibilities during the response, most likely at an initial reduced capacity.

- **Responding agencies will be functional but operating with reduced capacity and capability**

Responding local, regional and national agencies (such as emergency services, health services and welfare services) will self-activate within affected areas where those agencies have a presence. Like local authorities, national and regional responding agencies will initially be operating at reduced capacity.

- **Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.**

Triggered by a large Hikurangi earthquake, secondary hazards such as tsunamis, aftershocks, land subsidence and uplift/lateral spreading, liquefaction, landslides, rockfall, fire, flooding, dam collapse, building collapse, fire and seiching of large water bodies will pose an additional risk to life and will significantly impair the response and recovery processes.

- **Standard communications will be limited, where available, alternate communications will be used**

A large Hikurangi event will affect standard communications (including phones and internet) (See Section 3.1.5 for further detail). Responding Groups will need to rely on alternate methods to communicate. In some cases, alternate communication methods may also be impacted by the event (e.g. loss of radio systems due to tower collapse or loss of power to a tower). Communication may be hampered by the incompatibility of systems used by CDEM Groups and responding agencies.

- **Lifeline utilities will be limited or unavailable in the five CDEM Groups.**

Lifeline utilities, including the three waters, power and telecommunications, will be limited or unavailable in the five CDEM Groups for at least 7 days following the initial earthquake and tsunami impacts. Secondary hazards, such as landslides and aftershocks will impact the ability to restore these networks.

- **Movement corridors will be affected, and many roads will be unusable**

Landslides, lateral spreading and liquefaction will lead to many roads becoming unpassable, isolating some communities and CDEM Groups. This will significantly impact the supply chain and the mobility of responding agencies within and between regions.

- **Rail will be inoperable within the five CDEM Groups**

Rail networks in and between the five CDEM Groups, including the Wellington Regional network, Main Trunk Line and the Palmerston North - Gisborne Line (PNGL), will be unusable during response.

- **Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.**

All airports within the five CDEM Groups will experience severe shaking and will require assessment before being able to be declared operational. Even opened most will have operational restrictions due to the wider impacts, such as loss of power and standard communications.

It is assumed that Hawke's Bay airport will be permanently non-operational due to forecasted subsidence reclaiming the land to sea. Wellington airport is likely to be impacted by tsunami debris and not expected to be available until E +3 days. Gisborne and Palmerston North Airport are anticipated to be operational following assessment.

Additional assessments will be required following any substantial aftershock or tsunami.

- **Ports will be impacted by the earthquake and tsunami.**

Tauranga, Gisborne, Napier and Wellington Ports will be affected by earthquake and tsunami. Tsunami debris will likely damage critical assets such as piers and wharves, limiting their use until repaired. Liquefaction may also compromise foundations, destabilising port infrastructure. Assessments and harbour surveys will be required before the ports can be opened.

Additional assessments will be required following any substantial tsunami.

- **Health and welfare services will be overwhelmed.**

The large number of injuries and fatalities expected will overwhelm health services within the five CDEM Groups (See Appendix A.2: 'SitRep') Welfare services will be overwhelmed, especially due to the persons displaced, and possibly separated, during the immediate mass evacuation.

There will be significant international concern over family and friends who are unable to be contacted in the immediate aftermath of the response.

- **Communities will be isolated.**

Many communities will become isolated due to transport infrastructure damage or physical barriers, e.g. lateral spreading, wash outs, tsunami debris, liquefaction and/ or landslides. Depending on the scale of damage, it may take days to weeks to reach some isolated communities

- **Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.**

Many members of the public will self-evacuate (as encouraged through the 'long or strong, get gone' messaging) inland or to higher ground following the earthquake shaking.

A large proportion of those who self-evacuate will require assistance after reaching higher ground, inland areas or buildings if vertical evacuation has taken place. They may only have the items they evacuated with and will therefore have immediate needs - delays meeting these needs are likely to worsen health outcomes.

- **Depending on the time of day significant numbers will be displaced from their home locations.**

A large Hikurangi event could occur at any time. A daytime event in the working week will result in many people unable to return home in the initial response phase. These displaced people will need their immediate needs met. These displaced people will want to return to their families and home as soon as possible.

- **The community-led and tangata whenua response will work to meet communities immediate and basic needs where possible.**

Spontaneous community volunteer groups are to be expected to activate, and marae manaaki (hosting) is very likely where buildings are safe. Iwi/Taiwhenua and Haurora Providers will very likely activate their own response to the crisis. Community halls, facilities and homes may also be opened to vulnerable people. It is likely the spontaneous community-led and tangata whenua response forms to address the immediate needs of the community before official assistance from responding agencies can arrive.

- **Ordered mass-evacuation will not automatically occur.**

There will not be an automatic ordered evacuation of a large part of the general population from affected areas (excluding Emergency Mobile Alerts encouraging the public to evacuate tsunami evacuation zones). Any ordered evacuation that does occur will be covered by the National Action Plan and will be planned for and facilitated in partnership with affected CDEM Groups.

Note: Ordered mass-evacuation is independent of immediate self-evacuation for life safety (e.g. responding to a long or strong earthquake) which may be informed by Emergency Mobile Alerts (where power and telecommunication networks allow).

- **There will be significant and long-term environmental impacts.**

Fuel, chemicals and hazardous materials (e.g. human waste, milk waste) may be leaked during the earthquake and/or tsunami, leading to environmental damage but also health and safety risks for responding agencies.

A large amount of debris, e.g. building facades, harmful materials-asbestos, soil and rock, will be generated by this event, altering and in some cases harming the environment. This debris may block transport routes reduce the mobility of responding agencies.

- **National and regional assembly areas will be established in accordance with national and regional plans.**

The NCMC will direct Regional Assembly and Staging Areas (Air and Sea) to be established to enable the storage, organisation and mobilisation of resources required by the response. The locations to be used will be assessed for damage following initial and follow-on impacts

- **Offers of international assistance will be made and coordinated through the NCMC.**

Offers of or requests for international assistance will result from this event. These will be managed by MCDEM and considered by the National Security Committee of Cabinet (NSC), via the Officials Committee for Domestic and External Security Coordination (ODESC) system

Appendix 2 – Core objectives and agency responsibilities

Activity	Core objective	Agency responsibilities	
Phase one – Immediate response activities			
Alerts and notifications	<i>To ensure responding agencies within the region are alerted to issues relating to the event</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> Ensure that all responding agencies remain informed of the situation and alerts. This may need to be using alternate comms if the EMA system is unavailable (e.g. satellite/VHF comms)
		All other Agencies	<ul style="list-style-type: none"> Ensure that alerts and notifications are disseminated to all key staff
Warning and Informing the public	<i>To ensure timely provision of key emergency information to people impacted by the event</i>	Manawatū Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> Coordinate the provision of emergency information to the community across all available platforms
		All other agencies	<ul style="list-style-type: none"> Ensure key emergency information is provided to the community in coordination with the Manawatu Whanganui CDEM Group and Local CDEM PIM Functions
Self-evacuation and Life Safety	<i>To provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction</i>	Manawatū Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> Provide clear direction with regards to safe zone locations and evacuation routes
		NZ Police	<ul style="list-style-type: none"> Direct people to evacuate from areas at risk of inundation Support traffic management where safe to do so
		Fire and Emergency NZ	<ul style="list-style-type: none"> Coordinate USAR activities in impacted areas as the situation allows
		St John Ambulance	<ul style="list-style-type: none"> Provide medical assistance to those impacted by the event as the situation allows Support FENZ with USAR activities by providing medical assistance Transport injured persons to healthcare facilities
		Mid Central / Whanganui DHB	<ul style="list-style-type: none"> Ensure capability to meet the medical needs of the impacted population
Response Activation and Mobilisation	<i>To activate appropriate response facilities to enable coordination of the response at all levels</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the GECC Support key staff to access the GECC facility as required
		Local EOC's	<ul style="list-style-type: none"> Utilise all systems available to mobilise response staff and activate the EOC

			<ul style="list-style-type: none"> Support key staff to access the EOC facility as required
		Emergency Services	<ul style="list-style-type: none"> Activate response facilities, mobilise resources to respond and provide liaison to the GECC
Establishing communications	<i>To establish appropriate communication to enable coordination of the response and information sharing between key agencies</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> Ensure the operability of the Manawatu Whanganui CDEM Group VHF Network to support communication between responding agencies Deploy satellite communications to enable communication with the NCMC and the Emergency Services
		All other agencies	<ul style="list-style-type: none"> Ensure operability of VHF equipment to enable communication between the GECC and all responding agencies and internally with key response staff

Activity	Core objective	Agency responsibilities	
Phase two – initiating sustained response activities			
Providing Rapid Relief	<i>To ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> Establish a coordinated structure to support the provision of rapid relief both through formal and informal structures (community led responses)
		Local EOC's	<ul style="list-style-type: none"> Establish emergency shelters and CDC's to provide for the basic needs of people impacted by the event
		Welfare Providers	<ul style="list-style-type: none"> Ensure provision of rapid relief services in support of the GECC
Developing Situational Awareness	<i>Develop a clear understanding of the impacts of the event as soon as possible to support decision making</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts across all responding agencies Lead the welfare impact assessment process Conduct building damage assessments Conduct utility damage assessments
		Local EOC's	<ul style="list-style-type: none"> Lead the welfare impact assessment process Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city
		Fire and Emergency NZ	<ul style="list-style-type: none"> Lead the rapid impact assessment process and coordinate the collection of information by other emergency services Provide regular status reports to the Manawatu Whanganui CDEM GECC
		NZ Police	<ul style="list-style-type: none"> Support the rapid impact assessment process

			<ul style="list-style-type: none"> • Provide regular status reports to the Manawatu Whanganui CDEM GECC
		St. John Ambulance	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Manawatu Whanganui CDEM GECC
		Mid Central / Whanganui DHB	<ul style="list-style-type: none"> • Support the rapid impact assessment process • Provide regular status reports to the Manawatu Whanganui CDEM GECC
		Welfare agencies	<ul style="list-style-type: none"> • Support the welfare impact assessment process • Provide regular status reports to the Manawatu Whanganui CDEM GECC
		Lifeline Utilities	<ul style="list-style-type: none"> • Conduct utility damage assessments • Provide regular status reports to the Manawatu Whanganui CDEM GECC
Managed evacuation and exclusion	<i>To ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so</i>	Manawatū Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Identify areas for evacuation / exclusion and coordinate resources to support NZ Police
		NZ Police	<ul style="list-style-type: none"> • Conduct evacuations as requested by Manawatu Whanganui CDEM Group • Establish cordons and exclusion zones
Operational Planning	<i>To ensure a coordinated response through a consolidate planning process across all responding agencies</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> • Coordinate the development of the Manawatu Whanganui CDEM Group Action Plan
		Local EOC's	<ul style="list-style-type: none"> • Coordinate the development of local action plans to ensure the delivery of the Manawatu Whanganui CDEM Group action plan
		All other agencies	<ul style="list-style-type: none"> • Contribute to the development of regional and local action plans by identifying key tasks, issues and resource requirements
Management of resources	<i>To ensure the most effective use of all available resources in response activities</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise available response resources • Identify any critical resource needs and request from the NCMC if not available within the region
		Local EOC's	<ul style="list-style-type: none"> • Coordinate and prioritise the deployment of resources locally
		All other agencies	<ul style="list-style-type: none"> • Identify all available and critical response resources and provide to the Manawatu Whanganui GECC

Activity	Core objective	Agency responsibilities	
Phase three – sustained response activities			
Coordinated welfare delivery	<i>To provide for the on-going needs of the impacted population through the coordinated delivery of welfare services</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> • Coordinate the provision of welfare services to meet the on-going needs of those impacted by the event • Ensure critical resources required to provide for on-going needs are prioritised
		Local EOC's	<ul style="list-style-type: none"> • Ensure and coordinate the delivery of welfare services locally
		Welfare agencies	<ul style="list-style-type: none"> • Support the provision of on-going needs as requested by the Manawatu Whanganui CDEM Group • Identify any critical resource needs to enable the delivery of key welfare services
Restoration of essential lifeline services	<i>Restore basic services to the community to the maximum possible extent</i>	Manawatū Whanganui CDEM GECC	<ul style="list-style-type: none"> • Coordinate and prioritise the restoration of lifeline services
		Local EOC's	<ul style="list-style-type: none"> • Undertake the restoration of basic services to the community where possible to do so
		Lifeline Utilities	<ul style="list-style-type: none"> • Undertake the restoration of basic services to the community where possible to do so
Supporting community response and engagement	<i>Enable the community to lead response where appropriate through the provision of resources and advice</i>	Manawatū Whanganui CDEM GECC & Local EOC's	<ul style="list-style-type: none"> • Lead community engagement and provide supplies and resources to sustain community response efforts
		All other agencies	<ul style="list-style-type: none"> • Support community response efforts through provision of information, advice and resources
Debris management	<i>Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.</i>	Local EOC's	<ul style="list-style-type: none"> • Coordinate the collection, removal and disposal of debris

Appendix 3 – Hikurangi subduction draft event action plan

Event name:	AP Number:
Hikurangi Subduction earthquake and Tsunami	1
Operational period from:	Coordination facility:
	Manawatu Whanganui Group Emergency Coordination Centre
Operational period to:	Controller:

Summary of Incident / Event: (A summary of the hazard impacts, environment and response actions to date, including the most dangerous and most likely hazard scenarios. This is based on reconnaissance and status reports.)

- Mw 8.9 earthquake occurred on the Hikurangi subduction zone **at enter time and date here**. The earthquake was centred on the **central** portion of the Hikurangi subduction zone.
- A large tsunami was generated by the earthquake; the first wave arrived at Castlepoint **Enter time of arrival here**; waves will continue for up to 24 hours. Large numbers of people have self-evacuated inland and to higher ground on both coasts. An 'all clear' to return into the tsunami evacuation zone will not be issued until the risk of further inundation has abated.
- Impacts are not limited to Manawatū Whanganui, with damaging shaking experienced, and associated tsunami impacts across the North Island and top of South Island limiting the capacity of other CDEM Groups to support response in the worst hit areas.
- Ongoing aftershocks and associated tsunami continue-limiting the ability of emergency services to assist the trapped and injured within impacted areas.
- There is a large amount of isolation due to physical barriers and unavailable comms. This isolation applies to communities, resources and emergency services.
- The impact to engineering lifelines and transport nodes/links has been severe. There is limited communication, electricity and potable water.
- Many persons are displaced overwhelming the capacity of welfare systems to cope. These people have urgent and unmet needs such as food, water, shelter and clothing.
- The DHB's are overwhelmed with the amount of injuries presenting at primary and secondary health centres. Medical supplies are limited, and generators will be required to continue operating.
- This event is unprecedented, provision of life safety advice and reassurance is paramount to maintaining public order and saving lives as secondary hazards continue.

Mission: (Mission Statement.)

To ensure a coordinated and timely response to minimise loss of life and prevent escalation of suffering.

Intent: (Give the intent, best stated as a concept, key tasks and end-state. It is a broad statement of what must happen and when.)

To provide reassurance and information to our communities and meet their immediate and short term needs as soon as possible. Risks from, or created by, the event, will be mitigated as far as possible and response personnel will not be put into any situations that present additional danger beyond accepted levels to conduct their roles. This will be achieved by ensuring:

- The safety and wellbeing of people is kept at the centre of all response decisions
- The public are protected from entering dangerous areas
- People's basic and immediate needs are met as quickly as possible
- People can access adequate medical assistance
- A CIMS coordinating structure is established with a clear chain of command from the CDEM Group to responding organisations
- Information is readily shared between response organisations to improve situational awareness and decision making

The key priorities for the response are:

- Conduct life safety activities
- Identify and source key resources needed for response
- Establish response coordination arrangements
- Ensure immediate needs of the population are met
- Provide the public with appropriate response information
- Gain situational awareness
- Prioritise and manage resources

Designated Tasks: (Specific tasks and timings for each agency under the plan.)

Manawatū Whanganui CDEM GECC

- Ensure that responding agencies are kept alerted and informed with regards to the event and its impacts
- Coordinate the provision of emergency information to the community to reassure and support response activities
- Establish the GECC and communications to support the sharing of information between responding agencies
- Coordinate the provision of rapid relief across the region
- Coordinate the collection and analysis of information to inform situational awareness across all responding agencies
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons
- Coordinate the Group-wide response planning process
- Coordinate and manage the acquisition and prioritisation of response resources and emergency welfare resources

Local Authorities / EOC's

- Coordinate the provision of emergency information to the community to reassure and support response activities
- Establish communications to support the sharing of information between responding agencies
- Support the displaced population through the coordination of rapid relief and emergency shelter

- Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city Coordinate the collection of welfare needs information
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons
- Coordinate the local response planning process
- Coordinate and manage the delivery of local response resources and emergency welfare resources
- Conduct lifeline utility damage assessments and establish temporary arrangements for water distribution
- Clear key routes within district to enable response activities to occur
- Respond to public health issues as situation allows

New Zealand Police

- Establish response coordination facilities
- Carry out evacuations of identified areas as requested by the Manawatu Whanganui CDEM GECC
- Establish and maintain access control measures into evacuated areas
- Maintain law and order
- Support rapid impact assessment process
- Support Fire and Emergency New Zealand USAR activities
- Establish Inquiry and Disaster Victim Identification (DVI) process

Fire and Emergency New Zealand

- Establish response coordination facilities
- Coordinate USAR activities in impacted areas as situation allows
- Establish rapid impact assessment process where safe to do so

St. John Ambulance and Mid Central / Whanganui DHB

- Attend to urgent medical needs as situation allows
- Support Fire and Emergency New Zealand USAR activities
- Activate all operable medical facilities to support management of casualties
- Establish temporary morgue facilities
- Support on-going medical needs of population

Welfare Agencies

- Support the provision of rapid relief to the impacted population
- Support the rapid impact assessment process and the collection of welfare and community impact information

Te Puni Kōkiri (national and regional offices)

- To work with other government agencies and CDEM Groups to facilitate and co-ordinate support to Māori who require assistance, and to engage with iwi, hapū, whānau, and Māori communities to ensure their needs are met.
- To coordinate links with Iwi organisations to Māori communities to provide key emergency information and status reports

Lifeline Utilities Agencies

- Ensure key routes are cleared and alternate routes established where access is no longer possible to support response activities
- Ensure re-establishment of Palmerston North and Whanganui Airports to support deployment of resources
- Establish access to emergency power supplies and re-establish electricity network where possible to do so
- Establish temporary access to communications

Limiting Factors: (Matters that may or will limit options, timeframes, or outcomes.)

Matters that may or will limit options, timeframes and/or outcomes:

- Emergency services and USAR resources are limited
- Emergency Services are limited in their ability to carry out initial action plans in tsunami evacuation zones by the ongoing threat of tsunami
- Food and potable water supplies are limited within the Group
- Damage to the medical supply chain combined with a stretched health service (low staff numbers and high community demand) is leading to worsening health outcomes,
- Damage to power and telecommunication infrastructure is limiting the effectiveness of multi-agency coordination,
- Damage to transport infrastructure, e.g. from liquefaction or lateral spreading, is limiting the mobility of responding agencies around the region,
- Significant numbers of displaced people,
- The ability to sustain the immediate and basic needs of affected populations,
- Availability and ability of critical personnel to get to key areas e.g. engineers to certify use of assets & key medical staff to get to key medical facilities.

Coordination Measures: (Times, locations, boundaries, and other measures designed to coordinate the response.)

- The Group Emergency Coordination Centre is established at [REDACTED] and is operating 24/7
- Local EOC's are established at [REDACTED] and are operating 24/7
- ESCC meetings are occurring via satellite phone [REDACTED]
- GECC IMT meetings are at [REDACTED]
- Group Sitreps are released at [REDACTED]
- Status Reports are required from all agencies by [REDACTED]

Resource Needs: (Who will provide what and when they will do it – including: information, supply, personnel, equipment and transport.)

The Manawatū Whanganui CDEM Group requires assistance as soon as possible in the form of:

- Food, water, medical supplies and emergency shelter
- Fuel and generators

- NZDF and International Defence Forces support for logistics and operations (ships, helicopters, terminal operations teams, fuel delivery systems, water purification etc.)
- CDEM staff for GECC and local EOC's
- Surge support from the emergency services (incl. USAR and DVI specialists)
- Surge support from other responding agencies and organisations
- Medical staff and facilities
- Building and transport infrastructure assessors including technical experts for the detailed inspection of
- buildings and structures
- Assets to enable reconnaissance

Information Flow: (Who needs to know and who has information we need? May include key information requirements, or they may be attached.)

Information inputs:

- Warnings and alerts from NEMA / GNS
- Local Sitreps and action plans
- Situational awareness information gathered from rapid impact assessments, community and status reports
- NCMC Action Plan and situation reports
- Resource requests

All status reports to be sent to: [REDACTED]

Information outputs:

- Public information and alerts / warnings to responding agencies and public
- Situation reports
- Action Plan
- Resource requests to NCMC
-

Public Information Plan: (Outline of intended public information processes and outputs. This may be attached.)

Establish a regular schedule for the provision of warnings, life safety advice, information regarding the situation and reassurance regarding the response. Public communications will use consistent messaging guides where possible.

If standard telecommunications are not working, alternate means of communicating will need to be utilised.

Communications Plan: (Frequencies / purpose / coverage, role cell phone numbers communications schedule, etc..)

The Group ECC will utilise [REDACTED] **VHF Channels** to conduct communications with responding agencies

Where possible, this will be supplemented by satellite communications as available. The Group satellite phone numbers are as follows:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Appendix 4: Supporting diagrams

The following diagrams are based on the credible planning scenario and support the response concepts included this paper and in Volume II of the Hikurangi Response Planning toolbox. Please note the following diagrams are ‘examples’ only and are based on the credible planning scenario. They do not reflect planned response arrangements between the five CDEM Groups (Bay of Plenty, Tairāwhiti, Hawke’s Bay, Manawatū-Whanganui and Wellington) and estimated lifeline impacts require further refinement as part of regional response planning.

Figure 1: Inter-regional support (overleaf)

Following a large Hikurangi event it is likely some CDEM Groups may not have the capacity or capability to coordinate the response in one or more of their communities, requiring another CDEM Group with the capability and capacity to help by coordinating beyond its boundaries, for example, where a physical barrier, such as a landslide, may be isolating a community. Coordination across boundaries may also be necessary to achieve an effect, e.g. reconnaissance of an asset.

The decision for a CDEM Group to coordinate the response in a community beyond its boundaries would be a joint decision between the two CDEM Groups involved and would be in consultation with the National Controller and appropriate stakeholders.

Additionally, it is important to note some agency boundaries, such as NZ Police and Fire and Emergency NZ (FENZ) regions, do not align to regional council boundaries. Engagement and response planning with these agencies therefore requires a coordinated approach between the CDEM Groups and the agencies involved.

The requirement for national CDEM support and coordination should be identified and planned for where regions do not have the capability or capacity to meet response requirements themselves, or with direct coordination with adjacent regions.

Figure 2: Response Islands (overleaf)

This figure demonstrates the ‘response island’ concept at a regional scale, adapted from the Wellington Region Earthquake Plan (WREP). Please refer to the WREP for further information about response islands specifically in a Wellington context.

Following the credible scenario, landslides and/or damage to roading infrastructure is anticipated to isolate Tairāwhiti, Hawke’s Bay and Wellington regions, effectively creating ‘response islands’.

Until inter-regional road connections are restored, these regions will need to use alternate means (e.g. ships/planes) to fly people and resources into and out of the region.

Figure 3: Lifeline impacts – utilities (overleaf)

The figure below shows the estimated availability of lifeline utilities within the first seven days following the credible scenario. In the worst affected CDEM Groups, it is likely there will be no power, telecommunications, wastewater or potable water available within the first seven days following the credible scenario. It is important regional response planning plans for a response where these services are not available for a prolonged period of time.

Figure 4: Lifeline impacts – transport infrastructure (overleaf)

The figure overleaf shows the estimated damage and restoration times for transport infrastructure following the credible scenario. As shown in the figure, a large Hikurangi event could significantly affect inter-regional road connections, regional airports and ports. Significant damage or loss of this critical infrastructure would affect the way CDEM Groups respond to a large Hikurangi event and should therefore be considered as part of regional response planning.

Figure 1: Inter-regional support

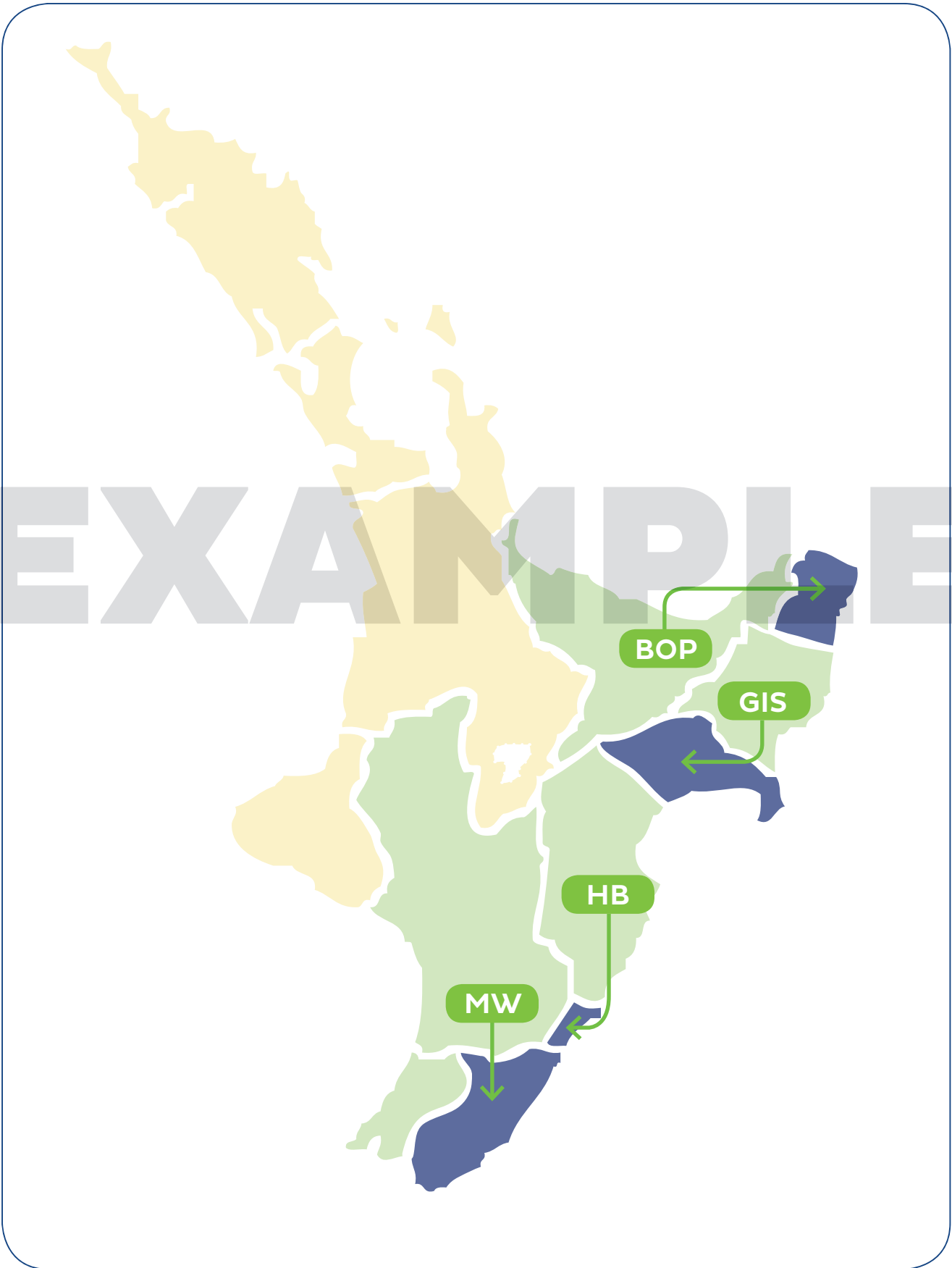
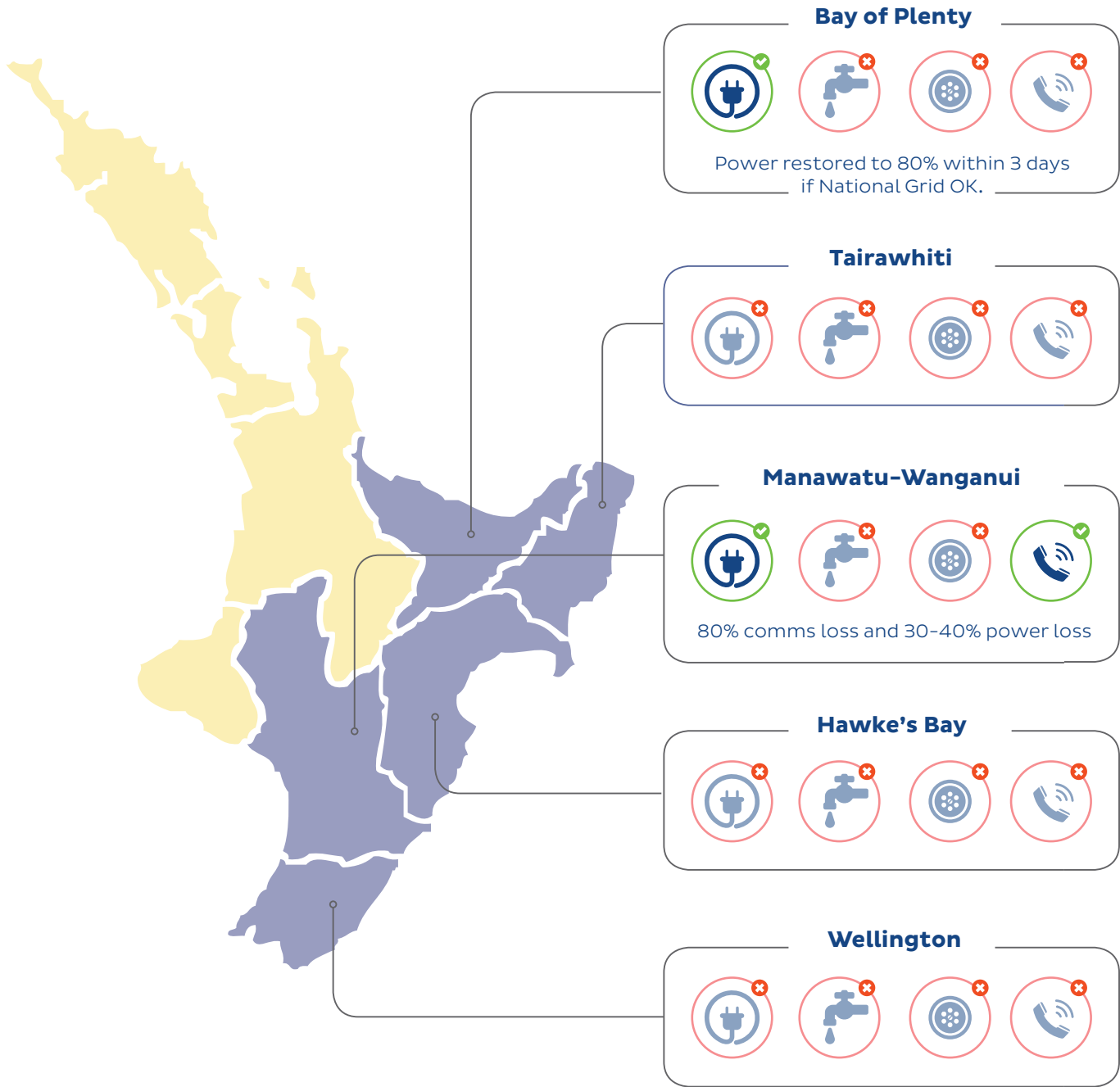


Figure 2: The 'island' concept



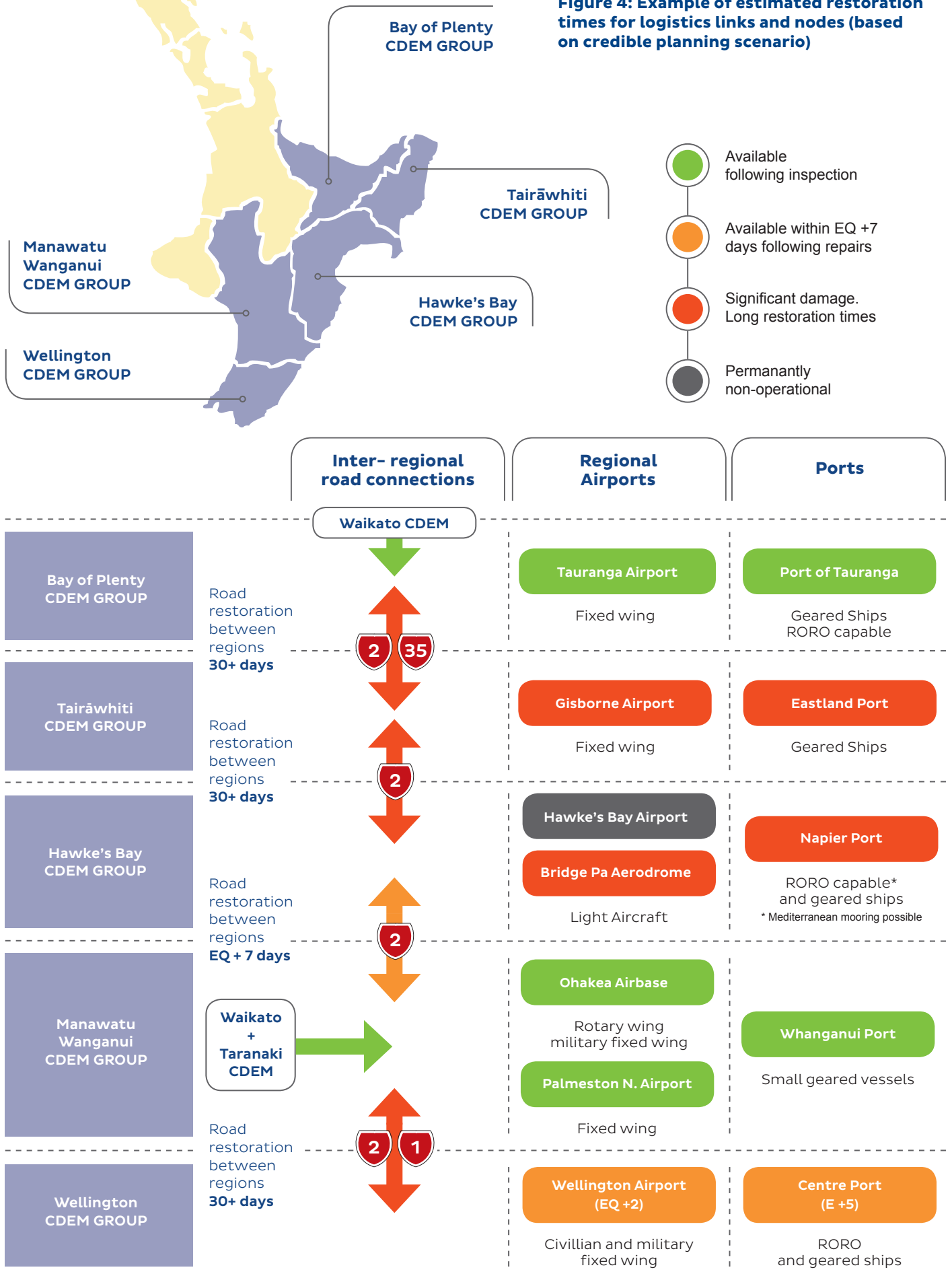
Figure 3: Example of lifeline utility availability in first seven days following credible scenario



KEY

- Power
- Potable water
- Waste water
- Telecommunications

Figure 4: Example of estimated restoration times for logistics links and nodes (based on credible planning scenario)





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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

WELLINGTON REGION CDEM GROUP

Hikurangi Subduction Zone Response Concept Paper 2020

Prepared by
East Coast Life at the Boundary (ECLAB)

Approved by:

Control Copy no:



WELLINGTON REGION
EMERGENCY MANAGEMENT

GROUP

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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 1

CONTEXT



WELLINGTON REGION
EMERGENCY MANAGEMENT

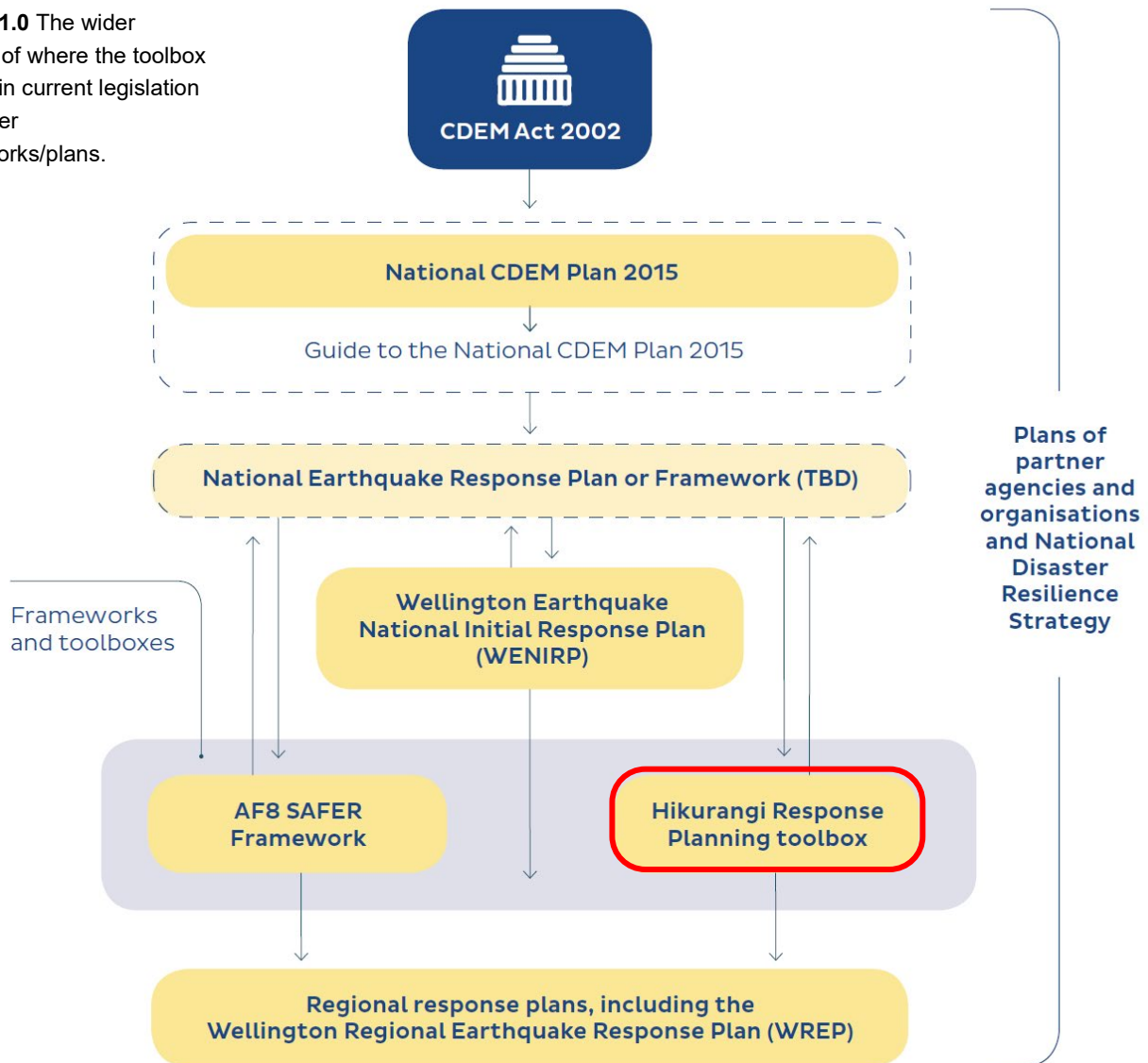
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1.0

Purpose of the document

The purpose of this annex is to outline the proposed response arrangements within the Wellington region to guide the response to a large tsunami generated from the Hikurangi subduction zone in support of the Wellington Region Earthquake Plan (WREP) and in advance of any planning under a national earthquake and tsunami framework (TBD). This Regional Response Concept paper fits within the Hikurangi Response Planning toolbox as pictured below.

Figure 1.0 The wider context of where the toolbox fits within current legislation and other frameworks/plans.



1.1

Scope

This annex is designed to be a guide for the Wellington CDEM response to a large tsunami, in addition to the arrangements outlined within the WREP. This annex does not supersede the arrangements detailed in the WREP.

The annex is based on a credible magnitude 8.9 earthquake and tsunami planning scenario as a tool to aid planning. While many of the arrangements in this annex may be applicable to a range of events, there may be some requirement to modify or develop new arrangements for some events.

1.2

Legislative arrangements

The initiation of any response will be supported by several key pieces of New Zealand legislation:

- Civil Defence and Emergency Management Act 2002
- Health and Safety in the Workplace Act 2017
- Fire and Emergencies Act 2017
- Police Act 2008

1.3

Supporting plans and documents

This annex is reliant upon other plans to be enacted in support. This includes arrangements for coordination, evacuation, welfare provision and lifeline utilities. The following plans should be used to support the implementation of this response plan:

- Wellington Region CDEM Group Plan
- Wellington Region Earthquake Plan (WREP)
- Wellington Region Earthquake Plan Implementation Guide
- Wellington Orange Zone Tsunami Plan

1.4

Audience

This annex is intended to provide response guidance to the audience outlined in the WREP.

1.5

Review

This annex will inform the proposed National Emergency Management Agency National Earthquake and Tsunami Response Framework. Nevertheless, depending on national framework progress this annex may be reviewed every five years, or as necessary, should any information regarding the implementation of any aspects of the response contained within change.

1.6

Exercising

This document will be exercised as part of the review process to ensure that the arrangements contained can be effectively implemented as required.

1.7

Response assumptions

In order to enable effective planning several assumptions have been made within the WREP regarding coordination of the event at a national level, availability of resources, the ability to respond and the activities of the community. Several assumptions within the WREP would be affected by a tsunami event, and therefore require the following modifications:

- Centre Port would be more moderately damaged than in the scenario used for the WREP, and therefore unable to be re-instated within the timeframes previously outlined.
- Wellington Airport is likely to sustain moderate damage from inundation at the southern end, including debris build up on the runway which may affect restoration timeframes outlined in the WREP. The road to/from the airport (Cobham Drive) would be more heavily impacted by an earthquake and tsunami, leading to longer times (potentially an additional 3 days to restore access to/from the airport (according to the work done by the Wellington Lifelines Group with NZTA and Wellington City Council in 2016).
- This event is likely to have a significant impact on regions along the East Coast of both islands. The WREP outlines the use of other seaports as logistics hubs for re-supply into the region. Although Auckland and Tauranga may still be useable in this scenario, the ports of Napier and Lyttleton are highly likely to have sustained damage from the tsunami that will make them inoperable for an extended period.
- Movement between the North and South Island will be severely compromised with Picton likely to have sustained a large amount of damage from both the earthquake and the tsunami.
- The neighbouring CDEM Groups (Manawatu-Whanganui, Hawke's Bay, Nelson-Tasman, Marlborough) are likely to have also sustained high levels of damage during the event and will be unable to support the Wellington Region response.

The Hikurangi Subduction Zone scenario used for the purposes of planning is based on a series of assumptions, as outlined below. A number of these assumptions are also shown within the WREP. A more detailed description of these assumptions is shown in Appendix 1 of this annex.

- The process of declaring local states of emergency will be initiated immediately.
- A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.
- CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.
- The National Crisis Management Centre will be activated (in Wellington or Auckland) but will initially be operating at a reduced level.
- Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.
- Local Government within the North and South Island will continue to operate but with reduced capacity and capability.
- Responding agencies will be functional but operating with reduced capacity and capability.
- Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.
- Standard communications will be limited, and so where available and appropriate, alternate communications will be used.
- Lifeline utilities will be limited or unavailable in the five CDEM Groups. Please refer to outage timeframes within the WREP Appendix A1, noting that lifeline outage timeframes will increase in areas affected by tsunami inundation.
- Movement corridors will be affected, and many roads will be unusable.
- Rail will be inoperable within the five CDEM Groups.
- Airports may suffer earthquake and tsunami damage.
- Ports will be impacted by the earthquake and tsunami.
- Health and welfare services will be overwhelmed.
- Communities will be isolated.

- Spontaneous self-evacuation to avoid tsunami inundation will occur, encouraged through the ‘Long or Strong, Get Gone’ messaging.
- Depending on the time of day significant numbers will be displaced from their home locations.
- The community led and Tangata Whenua response will work to meet communities immediate and basic needs where possible.
- Ordered mass-evacuation will not automatically occur.
- There will be significant and long-term environmental impacts.
- National and regional assembly areas will be established in accordance with national and regional plans.
- Offers of international assistance will be made and coordinated through the NCMC.

1.8 Planning scenario overview

This annex has used a credible planning scenario, developed by GNS Science (**Power et al., 2018**), as a tool to develop the HRP Toolbox and this annex. A high-level overview of the scenario is provided in the sections below. For further detail, refer to Volume I of the HRP Toolbox for the full scenario.

The earthquake

The planning scenario starts with a magnitude 8.9 earthquake on the southern portion of the Hikurangi Subduction zone. This is a realistic, large earthquake that would impact most of the subduction zone and is slightly lower than the maximum plausible magnitude of Mw 9.0. Shaking in the Wellington Region would be extremely severe, between 8 and 10 on the modified Mercalli scale and lasting for between 20 – 40 seconds. Landslides across the region would also be severe as a result of the shaking, cutting off the region from the rest of the country.

Offshore the earthquake would cause widespread uplift of the seafloor right out the trench of around 2 – 2.5m. This uplift would result in the creation of a series of tsunami.

It is likely that significant aftershocks would continue for many weeks and months after the initial event, with some aftershocks exceeding Mw 7.0 and possibly requiring sustainment of exclusion zones or further evacuations of the population.

The tsunami

The earthquake would create a series of tsunami waves with average heights of 7 – 8 metres at the coast. Inundation along the Wellington Region coast would be extensive, with flow depths of over 3 metres in some low-lying areas but averaging 1 – 2.5 metres across most of the region. In this scenario, inundation is slightly mitigated by the uplift of land that has occurred as a result of the

earthquake; however, inundation would still occur up to 2km inland in Petone (4km up the Hutt River).

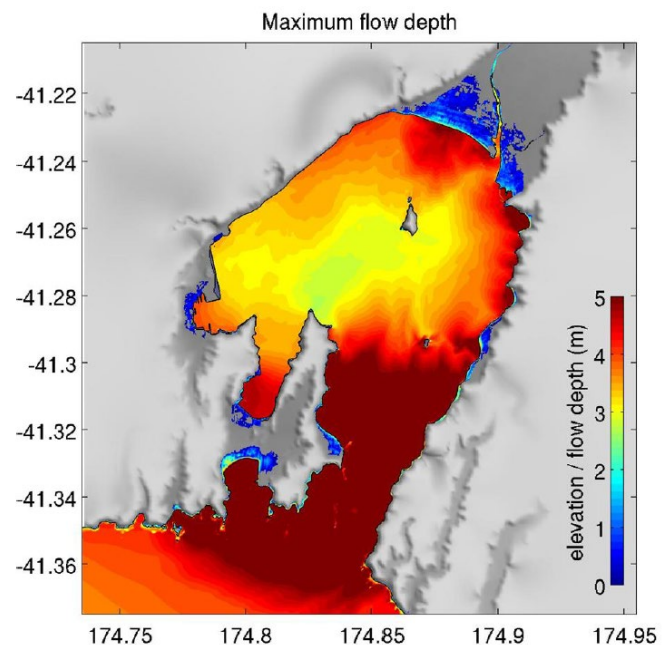


Figure 2.0: Modelled inundation flow depths for Napier and Hastings (Power et al., 2018).

The first wave would be expected to impact the south coast of the region within 10 minutes of the earthquake occurring and within 30 minutes for areas around the inner harbour, such as the CBD and Petone. Wave heights would peak around 40 minutes after the initial earthquake along the south coast and around 60 minutes after the earthquake in the inner harbour. Significant wave activity would be expected for several hours after the initial earthquake and a marine threat would persist for over a day.

Alternative Scenarios

Several other scenarios were modelled to show the potential impacts to the region. These are shown in the GNS Science report. They included modelling a rupture of the fault further north from the above scenario, varying the

slip distribution and a scenario focussing on a rupture in the area of strong coupling to the south of the Hikurangi zone.

In Scenario E (a rupture in the southern 'locked' portion of the subduction zone) Wellington Region is significantly impacted by both the earthquake and the tsunami. The other scenarios within the report pose a lesser risk to the region. Therefore, the measures contained within this plan should be suitable for a range of events that could potentially occur from a Hikurangi Subduction Zone event.

Vulnerabilities

In *addition* to the vulnerabilities shown in the WREP, the following would also apply to a Hikurangi earthquake and tsunami event:

• **Additional deaths and injuries will occur**

Additional people will be killed or injured as a result of the tsunami inundation, particularly in coastal areas already impacted by the earthquake, such as Lyall Bay, the CBD and Petone.

• **A larger number of people will be displaced by the event**

Areas such as Lyall Bay, Eastbourne and Petone will be heavily impacted by inundation from the tsunami, further damaging housing stock and lifeline utilities, making the areas uninhabitable.

Approximately 60,000 people live within the tsunami evacuations zones in the Wellington region. An approximate breakdown of population numbers per zone and by age is shown below:

Zone	Population within tsunami evacuation zones (approximate estimation)
Red	230
Orange	21,150
Yellow	30,8100

Age	Population within tsunami evacuation zones (approximate estimation)
0 – 15ys	10,880
15 – 65yrs	39,360
>65yrs	9,250

• **Critical response assets will be impacted**

It is likely that the response will be significantly impacted by the impact of the inundation. Key response resources located in inundation zones may be severely impacted, including emergency services facilities and resources, heavy plant and machinery and response personnel.

• **Neighbouring regions will be heavily impacted**

The event will have a huge impact across the entire of New Zealand, including neighbouring regions such as Manawatu-Whanganui, Hawke's Bay, Nelson-Tasman and Marlborough. This will cause complications with re-supply into the region.

• **Parts of the region could be isolated**

Additional areas within the region could become cut-off due to the inundation and damage caused by the tsunami

• **There will be extended restoration timeframes for lifelines and transport infrastructure**

Overall, tsunami inundation of lifeline and transport infrastructure will extend restoration timeframes detailed in the WREP. Specifically, this will affect:

- Additional parts of already impacted transport routes
- Lifeline utilities in areas where inundation has occurred
- CentrePort
- Wellington Airport.

• **Building damage will be widespread**

In addition to the damage caused by the earthquake, where buildings will potentially collapse or become severely compromised, the inundation from the tsunami will cause further damage to already impacted buildings and to buildings that were not damaged by the quake.

• **Larger amounts of debris will require disposal**

The tsunami is likely to result in additional debris in many areas, including silt, vegetation, vehicles and building materials. This debris may impede the movement of emergency services within the region.



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 2

RESPONSE IMPLEMENTATION



WELLINGTON REGION
EMERGENCY MANAGEMENT

GROUP

2.0

Response arrangements

Initiation of response

The initiation of a response will be the result of a long or strong earthquake occurring. Initially it will be unknown if the earthquake is associated with the Hikurangi subduction zone and therefore if a tsunami has been created.

Mission

The Wellington CDEM Group initial regional response for a major earthquake and tsunami generated by the Hikurangi subduction zone will be mobilised in an appropriate and timely manner to coordinate essential support to Wellington's regional population in order to:

- Minimise loss of life,
- Provide for the immediate needs of the affected people,
- Mitigate hazards, and,
- Retain public confidence.

Intent

The intent of the WREP and this annex is to provide sufficient guidance to the Wellington CDEM Group to enable achievement of the mission identified above. The risks presented by a major earthquake and tsunami affecting Wellington cannot be eliminated, but they can be reduced through comprehensive planning and preparation beforehand, and by prompt, proactive and coordinated response actions. The Wellington CDEM Group will automatically activate their usual or alternate response coordination and emergency centres in accordance with the WREP without waiting for central direction. The immediate response objectives are to:

- Gain timely situational awareness of the earthquake's impact
- Make appropriate decisions that will preserve life and care for the injured, sick and vulnerable people
- Provide immediate humanitarian needs (shelter, water, food and healthcare) to people in the affected areas
- Maintain law and order
- Coordinate multi-agencies responses
- Provide responder access into and evacuee egress from affected areas
- Prevent further casualties through reduction of hazards/risks
- Enable ongoing communication with all affected communities

- Minimise escalation of the consequences of the emergency; and
- Provide public information services to the community and the media, by all means available.

Limiting factors

1. Estimated time of arrival for first wave

The first waves from a major Hikurangi event would be expected to arrive around 10 minutes after the earthquake occurs. This will leave minimal time for self-evacuation activities and no time for more formal evacuation arrangements to be implemented.

2. Resource availability

The impacts of the earthquake and tsunami may make resources scarce until supply lines can be established from outside the region. Lack of resources (perceived or real) may result in panic buying or looting.

3. Lifeline utility damage

Lifeline utilities will be extensively damaged as a result of the event adding complexity to the ability to carry out response activities and establish a coordinated response. Please refer to outage timeframes within the WREP Appendix A1, noting that lifeline outage timeframes will increase in areas affected by tsunami inundation. Note many of the Lifeline agencies rely on the availability of contractors to enable response activities.

4. Continued risk of tsunami

The risk of tsunami will continue for up to 24hrs after the initial wave has impacted. There will also be risk of further tsunami with any significant aftershocks. This will prevent some response activities from occurring until safe access to an impacted area can be established.

5. Number of displaced persons

This event will result in many thousands of people becoming displaced in Wellington and the surrounding area including response staff, which will significantly impact the ability to respond. Quick reconnaissance of where people have been displaced to will be required to ensure aid reaches all those in need.

In addition, a number of areas surrounding the Wellington CBD (Lyall Bay, Petone) and other coastal settlements will no longer be inhabitable, and their populations displaced into the surrounding area.

6. Response coordination facilities and resources may not be available

Some response coordination facilities and resources may become unusable due to damage from the earthquake and tsunami. Isolation of some parts of the region, both by transport routes and communication, may mean some response coordination facilities have to operate for a sustained period without connectivity to the rest of the response and with very limited resourcing.

Response Agencies Roles and Responsibilities

The roles and responsibilities of the Wellington Region CDEM Group members are outlined in **Section 2.5** of the WREP.

Response Functions and Lead Agencies

The response functions and lead Agencies remain as stated in **Section 2.6** of the WREP.

Wellington CDEM Group governance requirements

The arrangements outline in **Section 2.11** of the WREP will still be applicable to this scenario. However, due to the extensive impacts of the event it would be unlikely that formal governance arrangements could be established within the first few days of the response.

Wellington CDEM Group specified response tasks

The specified response tasks outlined within the WREP remain relevant to this scenario. In some circumstances these may require modification due to the additional implications of the tsunami.

2.1

Response Phases

This annex uses a condition-based (rather than timebound) response phase concept to describe response activities from the immediate response (Phase I), through to the sustained response (Phase III). The concept is based on qualitative criteria and does not include timeframes or deadlines due to the complex nature of catastrophic disasters.

- **Phase 1 (Immediate response)**

The immediate response, where emergency services are reacting to the earthquake and tsunami which has just occurred - it is dominated by activities which enable lifesaving and life preservation.

- **Phase 2 (Initiation of sustained response)**

The gap between the immediate, uncoordinated response and one that starts to become self-sustaining. During this phase, response agencies have interim operating capability.

- **Phase 3 (Sustained response)**

A self-sustaining response bolstered by domestic and/or international resources where required. All responding entities are at full operating capacity and capability

Event timeline

	Event	Outcomes/Actions	Core response activities
Phase 1	Earthquake occurs	<ul style="list-style-type: none"> • Mainshock causes extreme damage across the Wellington region and wider East Coast of New Zealand including severe building damage and collapse in the CBD. • Coastal populations begin self-evacuating inland and to higher ground in an un-coordinated fashion. • Some evacuation routes are severely damaged, and people are unable to easily move to safety. • Emergency Services direct people to evacuate whilst moving key assets to safe locations and inland. • Electronic national and regional warnings issued for tsunami, however due to lifeline damage from the mainshock, are not able to reach most of the Wellington region population. 	<ul style="list-style-type: none"> • Alerts and notifications • Warning and informing (Public) • Self-evacuation and life safety activities • Response activation and mobilisation • Establishing communications
	First tsunami reaches shore	<ul style="list-style-type: none"> • Severe landslides have occurred across the region. • First tsunami wave has reached shore and inundation of low-lying areas including Lyall Bay, Petone and the CBD has begun. • Population continuing to self-evacuate • Aftershocks are ongoing. 	
	Major inundation from first wave	<ul style="list-style-type: none"> • Major inundation from tsunami now occurring along coast of Wellington region. • Some of the population has been unable to move to safety, others are still in the process of evacuating. • Major damage occurring to key infrastructure such as the port, state highways and airport as a result of inundation across the region. 	
	Displaced population arriving in safe areas	<ul style="list-style-type: none"> • Community unsure of what to do. Spontaneous first aid and assistance provided to evacuees by locals with resources at hand. • Emergency Services carry out initial actions plans, responding to immediate needs of those in safe areas and triaging medical assistance. • USAR and general rescue operations activities begin with in situ regional resources. • Evacuation of status 1 casualties begins. • Rapid impact assessments carried out in safe areas. • Response staff in affected areas check on their families. • Community-led response begins. 	
	Wellington Region CDEM Group activate response (possibly at	<ul style="list-style-type: none"> • Key staff alerted and begin travelling to the GECC where able. • Emergency Services activate response coordination facilities. 	

	alternate location)	<ul style="list-style-type: none"> • Identification of 'response islands' begins, using those pre-identified in Figure 20 (WREP) as a starting point. 	
	Basic communications established	<ul style="list-style-type: none"> • Basic VHF and satellite communications is established between key agencies. • Information gathering begins, however, there is limited situational awareness. 	
Phase 2	Delivery of rapid relief	<ul style="list-style-type: none"> • Community efforts to provide rapid relief to displaced and impacted persons bolstered. • <u>Community emergency hubs</u> to coordinate community-led efforts are established. 	<ul style="list-style-type: none"> • Displaced persons & Rapid Relief • Situational awareness to inform decision making • Managed evacuation and Control of movement • Operational planning • Management of resources
	Tsunami activity subsides, aftershocks on-going	<ul style="list-style-type: none"> • Coordinated rapid impact assessment undertaken in areas where inundation has occurred. • Emergency Services begin responding to immediate needs of those within the areas impacted by tsunami who have survived. • Ongoing aftershocks have the effect of pausing response activities, recommencing when risk of further tsunami assessed. 	
	Basic situational awareness gained	<ul style="list-style-type: none"> • CDEM Initial action plan developed. • Resources coordinated and deployed to priority areas. • Evacuation of other casualties as required begins, and as transport is available. • Identification of additional resource shortfalls and requests for support to NCMC begins. • Coordinated impact assessment begins. 	
	Surge support arrives	<ul style="list-style-type: none"> • Some international and domestic assistance starts to arrive but it is limited because of wide spread damage especially in North Island. • Preparation of Regional Assembly Areas begin. • USAR operations increase, with deployment of additional international teams into affected areas. 	
Phase 3	Welfare coordination established	<ul style="list-style-type: none"> • Community Emergency Hubs activated to meet basic needs of population. • Basic needs assessment process is conducted. 	<ul style="list-style-type: none"> • Coordinated welfare delivery, • Building Assessment • Restoration of essential lifeline services, • Supporting community response and engagement, • Debris and Environmental Management • Spontaneous Volunteers
	Supply chains established	<ul style="list-style-type: none"> • Supply of essential goods into the region occurs via WREP Emergency Supply Chain model (WREP Annex G) where possible. • Supermarkets and spontaneous 'hubs' (e.g. general stores with household items such as clothes) controlled by CDEM to ensure supplies are managed. 	
	Basic lifeline utilities re-established in inland areas	<ul style="list-style-type: none"> • Electricity is available to some parts of the region. • Basic mobile phone connections are re-established inland. • Temporary water supply is restored to some areas. 	
	Community response supported	<ul style="list-style-type: none"> • Community initiatives supported with resources. 	

	<p>Sustained response activities occurring</p>	<ul style="list-style-type: none"> • On-going welfare needs of the population are met including food supply and medium-term accommodation for displaced persons. • Lifelines are continuing to be restored in impacted areas. • Communication is improving. • Supply chains are improving, and increased resources are arriving to support the response. • Environmental clean-up occurring. 	
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2.2

Phase one- immediate response activities

Phase 1 response priorities

The following priorities exist for Phase 1 of the response:

- Conduct life safety activities
- Protect key resources needed for response
- Establish response coordination arrangements

Alerts and notifications

The natural warning signs (A long OR strong earthquake) will be the main alert to a major event occurring for all agencies. Given the nature of the event it may not be possible for the Wellington Region CDEM Group to issue a regional warning via the regional warning system, however, they should still endeavour to do this from a safe location, as it may still be received by some.

In addition to this alert it is assumed that a national warning will have been issued via the Emergency Mobile Alerting system and that this has been received where there is still capability in the communications networks.

As the event progresses alerts may need to be issued via other methods such as VHF and satellite communications.

Core activity outcome:

To ensure that responding agencies within the region are alerted to issues relating to the event

Warning and informing (Public)

Due to the nature of the event warning and informing the public may not be possible across many platforms.

In the early stages of the event (Immediately after the initial earthquake has occurred) there would be a reliance upon the population acting based on the long or strong messaging that is used to promote natural warning signs.

There may be limited phone signal as a result of the earthquake, but it must be assumed that a national warning would be put out using the Emergency Mobile

Alerting platform and where the capability was still operational this could be received by anyone with a mobile phone.

As the event progresses other platforms for communicating with the public may start to become available with the restoration of communications, however, during Phase 1 and 2 of the response communicating will be restricted

Core activity outcome:

To ensure the timely provision of key emergency information to people impacted by the event

Activation and mobilisation

The process of activation and mobilisation is outlined in the WREP **Sections 1.3 and 1.6**. In the initial phase of the event responding organisations will be utilising existing SOPs to respond accordingly. However, in order to ensure coordination across all agencies there will be a need to establish response coordination facilities and mobilise personnel and resources to carry out key response activities.

This process may be made extremely difficult by the lack of communications and accessibility of facilities. It is also highly likely that some staff and resources will have been lost due to their location at the onset of the event. In addition, severely damaged coordination facilities will require structural assessment by a suitably qualified building inspector before re-occupation.

Focus should be placed on ensuring the Group ECC and Local EOC's are activated as soon as possible to provide a base for the coordination of the response. In addition, the emergency services should focus on establishing response coordination facilities to manage the on-going life safety activities.

Self-evacuation and life safety activities

Tsunami evacuation

It is assumed that there will be mass self-evacuation from coastal areas following the earthquake and this will be strongly encouraged in any warnings that are issued. However, it is extremely likely that there will be severe

congestion, and some may be unable to evacuate to safety in time due to damage as a result of the earthquake, or their distance from a safe area. All efforts should be made by responding agencies to assist people to evacuate while ensuring that critical staff and resources are evacuated to safety to support the response.

Section 2.16 (Tsunami Evacuation) of the WREP outlines the actions to be taken regarding activation of the Wellington Orange Zone Tsunami Evacuation Response Plans.

Urban search and rescue

The preceding earthquake is likely to cause considerable damage within the region resulting in injuries and deaths. Initial focus for life safety activities should be directed towards those who have evacuated to a safe area or have been impacted by the event in areas away from the coast. The ongoing risk of tsunami will be a key consideration for USAR teams.

Urban Search and Rescue (USAR) provides a specialist technical rescue and response capability for the location and rescue of people following structural collapse events resulting from a major earthquake. USAR teams that deploy must be totally self-sufficient, to ensure they are not a burden on already overwhelmed communities and emergency responders. They are a resource available to the Group Controller, through Fire Emergency New Zealand (FENZ). In order to be effective USAR teams will need to be mobilised into the impacted areas as fast as possible, as the first 72 hours immediately following a major earthquake are considered the most critical to provide lifesaving assistance and treatment.

Urban Search and Rescue operations are outlined in **Section 2.14** of the WREP and these apply to this scenario.

Other response agencies (Response Teams)

Response resources will be limited within the first week of the response to this event. Wellington CDEM Group has a number of volunteer response teams as outlined in **Section 2.27** of the WREP and these should be utilised to support the life safety activities as requested by the Group Controller.

Health and disability

Section 2.26 of the WREP outlines the health and disability arrangements within the region and these should be applied to this scenario.

Core activity outcome:

Provide life safety activities where safe to do so and support self-evacuation through the provision of clear information and direction

Establishing communications

The ability to communicate between responding agencies and on the ground between responders is critical to enabling a coordinated and effective response to the impacts of the event. It is highly likely that the standard form of communication normally used will either be severely compromised or completely inoperable (e.g. landline and mobile phone networks, internet) and therefore other methods will need to be utilised.

The establishing of communications is outlined further in the **WREP Section 4.5** and in section 4 of this plan.

Core activity outcome:

To establish appropriate communication to enable coordination of the response and information sharing between key agencies

2.3

Phase two- initiating sustained response activities

Phase two response priorities.

The following priorities exist for Phase 2 of the response:

- Ensure immediate needs of the population are met
- Gain situational awareness
- Prioritise and manage resources

Situational awareness to inform decision making

Gaining a clear understanding of the event and ensuring that all responding agencies have a shared understanding of what has happened is vital to enabling clear and effective decision making. In the early phase of the response developing situational awareness will be made difficult due to the lack of communications, restriction on movement due to road damage, potential loss of personnel and ability to establish response coordination facilities.

Section 2.8 of the WREP outlines how developing situational awareness will occur following a major earthquake and this also applies to this scenario.

Core activity outcome:

Develop a clear understanding of the impacts of the event as soon as possible to support decision making.

Managed evacuation & control of movement

As situational awareness increases and there is more ability to respond in impacted areas, evacuations and exclusions may need to be implemented to prevent further risk to the population. This may be as a result of additional risk from the impacts (e.g. landslide risk, health risks etc) or to enable response activities to occur without risk to people in the area. Tsunami inundation is likely to make areas of coastline unsafe for the general public, requiring cordons and movement control to be in place to minimise the hazard.

Section 2.19 and 2.20 of the WREP outline evacuation and movement control arrangements and these are applicable to this scenario, noting that some elements may be difficult to implement due to resource availability and accessibility.

Core activity outcome:

Ensure impacted population is evacuated from at risk areas and are prevented from returning until safe to do so.

Displaced people & rapid relief

An event of this scale is likely to result in significant numbers of displaced people, numbering in the many tens of thousands. The WREP estimates a potential for up to 105,000 displaced across the region as a result of an earthquake alone. It would be highly likely that many thousands more would be displaced as a result of the tsunami.

Providing rapid relief in the early stages of the event is critical to ensuring that people can get through the initial impacts. Rapid relief includes food, water, shelter, and urgent medical needs.

This event is likely to require rapid relief provision to many thousands of people. The provision of rapid relief is likely to be hampered by the dispersed population and the access to resources. In the initial phase of the response the rapid relief provided may be extremely basic and rely heavily upon the community to support the effort until more coordination can be established and appropriate resources deployed.

Sections 2.17 and 2.23 of the WREP identify the requirements for dealing with displaced persons and providing rapid relief, noting that some of the tasks identified may be severely affected by the additional impacts of the tsunami.

Core activity outcome:

Ensure the provision of coordinated rapid relief to impacted persons as soon as practicable following the event.

Operational planning

In the initial phase of the response most activities will occur based on existing SOPs and plans of each agency. While some of the activities will have a level of coordination on the ground, there is likely to be some duplication of effort and confusion in exactly what needs to happen and a higher level of planning required to enable coordination across the entire response.

Initial action plans for the event are likely to be very basic and lack detail due to the limited information and scale of

the event. An example Action Plan is provided in the Appendix 2 of this annex. Consolidated planning can only begin to occur once clear communication has been established between agencies and there is a reasonable level of situational awareness regarding the impacts of the event and the issues that require response.

Operational planning for maritime, aviation and roading and re-supply has been conducted as part of the WREP and these are contained in **Annex D – G of the WREP**. It should be noted that some of the actions and timeframes contained within these plans may be unachievable as a result of the additional impacts from the tsunami.

Core activity outcome:

Ensure a coordinated response through a consolidated planning process across all responding agencies.

Aviation and maritime emergency response operations

Sections 2.12 and 2.13 of the WREP provide an overview of the re-establishment of aviation and maritime operations within the region. In addition, **Annex E & G of the WREP** provide operational plans to assist re-establishment.

It should be noted that a number of these resources may require larger timeframes to re-establish operations than stated within the WREP as a result of the additional damage that will be caused by inundation from the tsunami.

Core activity outcome:

Re-establish aviation and maritime operations within the region to support re-supply.

Management of resources

Due to the extent of the impacts, resources to respond are likely to be severely impacted. Careful management of these will be required at an early stage to ensure that priority issues can be responded to effectively.

The WREP outlines the management of resources in **Sections 3.1 to 3.3**. The actions outline would still apply in this scenario.

Core activity outcome:

Ensure the most effective acquisition and use of all available resources in response activities.

2.4

Phase three- sustained response activities

Phase three response priorities

The following priorities exist for Phase 3 of the response:

- Ensure on-going needs of the population are met
- Restore key lifeline services
- Support community response activities

Coordinated welfare delivery

The provision of welfare services to those impacted by the event will require coordination across multiple agencies and the community and will require significant resources to ensure people are able to manage through the event.

The region is likely to have significant numbers of displaced persons who have evacuated from the coast and cannot return to their homes. Potentially there could be many thousands of people displaced long term as a result of the event, with many more only able to shelter in their homes and having limited access to utilities. While some of these people may be able to stay with friends and family in areas not as heavily impacted, a large majority will be reliant upon help to find accommodation and meet their basic needs for an extended period of time. The provision of long-term accommodation, financial assistance and household goods and services will be a critical element of providing for the immediate and on-going needs of the population.

In addition, several areas of Hawke’s Bay will be cut-off from support due to infrastructure damage and may have to provide for their own welfare for extended periods of time until supplies can be taken in. The Wairarapa is likely to be separated from the rest of the region and critical supplies and support may need to be brought in from Manawatu-Whanganui in order to meet the immediate and basic needs of the population there.

The WREP outlines welfare arrangements for the region in **Sections 2.23 to 2.25**.

Core activity outcome:

Provide for the on-going needs of the impacted population through the coordinated delivery of welfare services.

Building assessment

Building assessments will enable some emergency operations to occur safely where there is a risk of collapse and appropriate action to be taken to make them safe. It may also enable some of the population to return and shelter in place, lessening the burden for emergency accommodation.

The process for building assessment is outlined in the WREP, **Section 2.18**.

Core activity outcome:

Ensure the safety of buildings to protect life and enable habitation where possible.

Restoration of essential lifeline services

The restoration of Lifeline services is essential to enable some aspects of the response to occur and for the population to return to their homes where possible.

Sections 3.4 to 3.11 of the WREP outlines the lifeline response within the region following a major quake. It should be noted that some of these actions may not be achievable or may take considerably longer as a result of

the tsunami inundation. Section 3 of this annex outlines the likely additional lifeline impacts of this scenario.

Core activity outcome:

Restore basic services to the community to the maximum possible extent.

Clearance of debris and environmental management

The clearance of debris is outlined in **Section 2.21** of the WREP and these actions are still applicable to this scenario, noting that there may be additional debris as a result of the tsunami inundation.

Core activity outcome:

Manage debris to enable access and restoration of services while protecting the population from harmful substances and waste.

Supporting community response and engagement

The community will play an integral part in the response and will be vital in ensuring that the wider community is able to manage through the impacts of the response.

In the early phases of the response it is highly likely the community will provide for the immediate medical and welfare of those impacted by the event. While this may be sustainable in the short term, it will require support from the Wellington CDEM Group as supplies become limited, or more expertise is required.

Communities are also likely to lead the response efforts in their area in terms of debris clearance and this will need to be supported by the Wellington CDEM Group to ensure it occurs in a coordinated fashion and does not put anyone at risk.

Where possible, existing community groups should be utilised to provide information to the wider community and coordinate response efforts in their area.

The WREP outlines the use of spontaneous volunteers, establishing of community hubs and working with Iwi in **Sections 2.22, 2.25 and 2.28.**

Core activity outcome:

Enable the community to lead the response effort where appropriate through the provision of resources and advice.

2.5 Inter-regional response requirements

Working with neighbouring regions

The event will impact most regions in New Zealand, given the scale of the earthquake and generated tsunami. As a result, support from neighbouring regions may need to be sought to assist parts of the Wellington region. This is most likely to be the case for the Wairarapa, which will likely be cut-off from the remainder of the region, requiring the Hawke’s Bay region to provide assistance.

Requesting support

Requesting support from a neighbouring region will require discussion between the National Controller and the two Regional Controllers. Memorandums of Understanding (MOU’s) created in readiness may facilitate this occurring more quickly in response.

The requirements for inter-regional support are discussed in Volume II of the HRP Toolbox.

Priority inter-regional information requirements

The following diagram shows the initial Wellington CDEM priority inter-regional information requirements to enable the emergency response.

In addition to the status of these assets, the status of neighbouring CDEM Groups also represents a priority information requirement.



Figure 2.0: Wellington CDEM Priority inter-regional information requirements



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 3

LIFELINES



WELLINGTON REGION
EMERGENCY MANAGEMENT

GROUP

3.0

Lifeline utilities

The WREP outlines the response to lifeline utilities and the likely impacts of a major earthquake on each of these in **Section 3.4 to 3.11**. With the added impact of the tsunami inundation, the following additional impacts may be seen across the lifeline utilities.

Roading

Roading will be heavily impacted by the mainshock and aftershocks, however, there may be additional damage caused to coastal roads around the region, further isolating parts of the community. State Highway 1/2 from Wellington to Petone and State Highway 1 from the Airport to the Wellington tunnel are likely to sustain significant damage from inundation.

Several other significant coastal roads around the inner harbour are also likely to be severely impacted by the inundation including;

- Marine Drive (Point Howard to Muritai)
- Port Road
- The Esplanade and Waione St & Bridge
- Aotea / Waterloo / Jervois Quays
- Cable Street in the CBD
- Oriental Parade and Evans Bay Parade.

Coastal roads on the Southern Coast around Lyall Bay, Miramar and Island Bay are also likely to sustain significant inundation damage (Shelley Bay Rd/Massey Rd/Karaka Bay Rd/Marine Parade, Breaker Bay Rd/Moa Point Rd/Lyall Parade/Queens Drive/The Esplanade)

Air and maritime

It is highly likely that the southern portion of the Wellington Airport will be impacted by inundation, resulting in damage to infrastructure and requiring additional debris clearance to re-establish operations.

CentrePort and other wharves around the inner harbour are also likely to have suffered significant damage from the tsunami.

There is likely to be significant debris left floating in the harbour after the event including large items like containers, boats, logs and other items. These will pose significant

maritime hazards as long as they remain floating in the harbour. In addition, tidal actions are likely to see debris float out to the harbour and into the Cook Strait posing further issues.

Navigation hazards are likely to significantly impact the ability of any maritime response, for example operations may only occur during daylight hours or vessel escort is required. Ports may become operational before vessels/ferries can access them.

Rail

Rail links into (and within) the capital will have sustained severe damage from the earthquake and may sustain additional damage in some areas due to inundation, particularly between Wellington and Petone.

3 Waters

The water supply sewage and stormwater infrastructure in areas of inundation is likely to have been significantly damaged by both the earthquake and the tsunami and will be beyond repair in some areas. However, due to the likely damage to housing stock as a result of inundation these will not be a priority for restoration in these areas.

The WREP outlines the location of emergency water supplies in **Section 3.6**. While the majority of the emergency water supplies still remain applicable, the location of desalination plants will need to be revised as a result of the potential damage from the tsunami and the accessibility into those areas.

Electricity supply

Electricity supply resources in areas of inundation are likely to have suffered severe damage. Given the likely damage to housing stock there will be a lower priority for restoration, unless support is required for a significant resource e.g. Wellington Airport.

Telecommunications

Telecommunications infrastructure in tsunami inundation zones will be heavily impacted as a result of the tsunami

resulting in wider scale communications outages in some areas, particularly around the Wellington and Petone areas.

Fuel supply

Fuel storage facilities in Seaview are very likely to be impacted from tsunami inundation and debris. In addition, roads to and from the fuel depots are also likely to also suffer damage from liquefaction and tsunami debris.

Other smaller fuel storage sites located in inundation zones may also be impacted as a result of the inundation. This will result in widespread fuel shortages requiring re-supply from outside the region.

Aside from fuel shortages, fuel spills across the region will pose a hazard to the response as flammable material and as an environmental contaminant. The environmental clean-up from a large Hikurangi event will need to be prioritised appropriately within the response as a potential ignition source and to minimise damage to the environment.

Major hazard storage facilities'

A number of the major hazard storage facilities listed in **Section 3.10** of the WREP are likely to be severely damaged, or potentially destroyed by the inundation from the tsunami.

Loss of fuel and gas facilities will further restrict the amount of fuel available for regional emergency response operations, until the region can be re-supplied. Spillage and contamination from damaged hazardous facilities would also represent an additional hazard and potential threat to life safety.

Generator supply

Generator supply is outlined in **Section 3.11 of the WREP**, however, some of these suppliers are located in tsunami inundation zones and so it is likely the resources will not be available.



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 4

CONTROL & COMMUNICATIONS



WELLINGTON REGION
EMERGENCY MANAGEMENT

GROUP

4.0

Emergency management locations and contacts

The WREP outlines the location of key response coordination facilities in **Section 4.1**.

It is highly likely that some key response coordination facilities of core agencies will be heavily impacted by the event and may become unusable. Response coordination facilities within tsunami evacuation zones will be unable to operate until the risk of further tsunami has abated.

Establishment of these facilities will be dependent upon accessibility, structural safety and access to key equipment, resources, and lifeline services such as emergency power.

4.1

Priority Wellington CDEM Group sites

The WREP outlines priority sites to be established in **Section 4.4**. The following may not be able to be established due to the risk of tsunami, or as a direct result of tsunami inundation:

- Seaview Marina Regional assembly area
- Fuel depot sites in Seaview
- CentrePort wharves

4.2

Communication arrangements

Section 4.5 of the WREP outlines the communications arrangements for the Wellington region. It should be noted that in some areas all communications methods may be further damaged as a result of the inundation.

Telecommunications response

The telecommunications response is outlined in **Section 4.6** of the WREP. As above, some elements of the activities outlined in this section of the WREP may not be possible or delayed as a result of the additional damage caused by inundation in some coastal areas.

Public Information Management

Public information management will be extremely difficult during this event, with the majority of means of communication unavailable in the early stages. **Section 4.8** of the WREP outlines how public information management will be coordinated.



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HIKURANGI RESPONSE PLANNING

LIFE AT THE BOUNDARY

SECTION 5

APPENDICES



WELLINGTON REGION
EMERGENCY MANAGEMENT

GROUP

Appendix 1: Response assumptions

Following a large Hikurangi event, it is assumed:

- **The process of declaring local states of emergency will be initiated immediately.**

A large Hikurangi event will have significant impacts on all five CDEM Groups. It is assumed local authorities and CDEM Groups affected will immediately initiate the process of declaring states of local emergency.

- **A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact.**

A state of national emergency is likely to be made by the Minister of Civil Defence within the first 24 hours of the response; however, this will depend on the scale of the impact. Ultimately, this is the decision of the Minister of Civil Defence, on advice of the National Controller and/or Director of Civil Defence Emergency Management.

Following declaration, the National Crisis Management Centre (NCMC) will direct the overall response. The NCMC will be situated in Wellington or at its secondary location in Auckland.

- **CDEM Coordination of local responses will be initially reduced due to the immediate impact of the event.**

A large Hikurangi event will significantly impact the five CDEM Groups. This will lead to a reduced level of operations immediately following the initial earthquake and subsequent tsunami impacts. It is not expected that the five CDEM Groups will be able to immediately activate and lead a coordinated response.

Each of the five CDEM Groups on the North Island East Coast have primary and secondary or mobile Emergency Coordination Centres (ECCs). Most Emergency Operations Centres (EOCs) have primary and secondary locations in each of the five Groups. The community, local, regional and multi-agency response will be led and coordinated from these centres including communication and coordination with other CDEM Groups and the NCMC.

- **The National Crisis Management Centre will be activated (in Wellington or Auckland) but is initially operating at a reduced level.**

The NCMC will be functional but will initially be operating at reduced level. The NCMC will be able to coordinate the national response in Wellington or from its alternative site in Auckland.

- **Initial tsunami threat maps are estimated to be produced by the National Geohazards Monitoring Centre (NGMC) within 20-30 minutes**

Following a large Hikurangi event it is estimated it could take approximately 20-30 minutes for the National Geohazards Monitoring Centre (NGMC) to make an initial assessment and relay initial threat maps to the NEMA duty team using alternate communications, e.g. satellite phone and BGAN, if necessary. The NEMA Duty Team would then pass this information onto CDEM Groups to inform decision making.

- **Neighbouring CDEM Groups may not be able to immediately assist CDEM Groups most affected.**

A large Hikurangi event will impact Groups wider than those scoped by this framework. This framework does not assume the five CDEM Groups will receive any assistance from near or neighbouring CDEM Groups as it is likely they will be dealing with their own impacts. Depending on their capacity, CDEM Groups in lower South Island and upper North Island (e.g. Northland CDEM) may be available to assist those most affected. Offers and requests for inter-Group assistance will be coordinated by the NCMC.

- **Local Government within the North and South Island will continue to operate but with reduced capacity and capability**

North and South Island authorities (local and territorial councils), will continue to operate but with reduced capacity and capability. Local government authorities, with regulatory oversight responsibility, will continue their same roles and responsibilities during the response, most likely at an initial reduced capacity.

- **Responding agencies will be functional but operating with reduced capacity and capability**

Responding local, regional and national agencies (such as emergency services, health services and welfare services) will self-activate within affected areas where those agencies have a presence. Like local authorities, national and regional responding agencies will initially be operating at reduced capacity.

- **Secondary hazards, including tsunami, will occur throughout the response affecting response and recovery.**

Triggered by a large Hikurangi earthquake, secondary hazards such as tsunamis, aftershocks, land subsidence and uplift/lateral spreading, liquefaction, landslides, rockfall, fire, flooding, dam collapse, building collapse, fire and seiching of large water bodies will pose an additional risk to life and will significantly impair the response and recovery processes.

- **Standard communications will be limited, where available, alternate communications will be used**

A large Hikurangi event will affect standard communications (including phones and internet) (See Section 3.1.5 for further detail). Responding Groups will need to rely on alternate methods to communicate. In some cases, alternate communication methods may be also be impacted by the event (e.g. loss of radio systems due to tower collapse or loss of power to a tower). Communication may be hampered by the incompatibility of systems used by CDEM Groups and responding agencies.

- **Lifeline utilities will be limited or unavailable in the five CDEM Groups.**

Lifeline utilities, including the three waters, power and telecommunications, will be limited or unavailable in the five CDEM Groups for at least 7 days following the initial earthquake and tsunami impacts. Secondary hazards, such as landslides and aftershocks will impact the ability to restore these networks.

- **Movement corridors will be affected, and many roads will be unusable**

Landslides, lateral spreading and liquefaction will lead to many roads becoming unpassable, isolating some communities and CDEM Groups. This will significantly impact the supply chain and the mobility of responding agencies within and between regions.

- **Rail will be inoperable within the five CDEM Groups**

Rail networks in and between the five CDEM Groups, including the Wellington Regional network, Main Trunk Line and the Palmerston North - Gisborne Line (PNGL), will be unusable during response.

- **Airports may suffer earthquake and tsunami damage. Hawke's Bay airport will be permanently non-operational.**

All airports within the five CDEM Groups will experience severe shaking and will require assessment before being able to be declared operational. Even opened most will have operational restrictions due to the wider impacts, such as loss of power and standard communications.

It is assumed that Hawke's Bay airport will be permanently non-operational due to forecasted subsidence reclaiming the land to sea. Wellington airport is likely to be impacted by tsunami debris and not expected to be available until E +3 days. Gisborne and Palmerston North Airport are anticipated to be operational following assessment.

Additional assessments will be required following any substantial aftershock or tsunami.

- **Ports will be impacted by the earthquake and tsunami.**

Tauranga, Gisborne, Napier and Wellington Ports will be affected by earthquake and tsunami. Tsunami debris will likely damage critical assets such as piers and wharves, limiting their use until repaired. Liquefaction may also compromise foundations, destabilising port infrastructure. Assessments and harbour surveys will be required before the ports can be opened.

Additional assessments will be required following any substantial tsunami.

- **Health and welfare services will be overwhelmed.**

The large number of injuries and fatalities expected will overwhelm health services within the five CDEM Groups (See Appendix A.2: 'SitRep') Welfare services will be overwhelmed, especially due to the persons displaced, and possibly separated, during the immediate mass evacuation.

There will be significant international concern over family and friends who are unable to be contacted in the immediate aftermath of the response.

- **Communities will be isolated.**

Many communities will become isolated due to transport infrastructure damage or physical barriers, e.g. lateral spreading, wash outs, tsunami debris, liquefaction and/ or landslides. Depending on the scale of damage, it may take days to weeks to reach some isolated communities

- **Spontaneous self-evacuation will occur, encouraged through the 'Long or Strong, Get Gone' messaging.**

Many members of the public will self-evacuate (as encouraged through the 'long or strong, get gone' messaging) inland or to higher ground following the earthquake shaking.

A large proportion of those who self-evacuate will require assistance after reaching higher ground, inland areas or buildings if vertical evacuation has taken place. They may only have the items they evacuated with and will therefore have immediate needs - delays meeting these needs are likely to worsen health outcomes.

- **Depending on the time of day significant numbers will be displaced from their home locations.**

A large Hikurangi event could occur at any time. A daytime event in the working week will result in many people unable to return home in the initial response phase. These displaced people will need their immediate needs met. These displaced people will want to return to their families and home as soon as possible.

- **The community-led and tangata whenua response will work to meet communities immediate and basic needs where possible.**

Spontaneous community volunteer groups are to be expected to activate, and marae manaaki (hosting) is very likely where buildings are safe. Iwi/Taiwhenua and Haurora Providers will very likely activate their own response to the crisis.

Community halls, facilities and homes may also be opened to vulnerable people. It is likely the spontaneous community-led and tangata whenua response forms to address the immediate needs of the community before official assistance from responding agencies can arrive.

- **Ordered mass-evacuation will not automatically occur.**

There will not be an automatic ordered evacuation of a large part of the general population from affected areas (excluding Emergency Mobile Alerts encouraging the public to evacuate tsunami evacuation zones). Any ordered evacuation that does occur will be covered by the National Action Plan and will be planned for and facilitated in partnership with affected CDEM Groups.

Note: Ordered mass-evacuation is independent of immediate self-evacuation for life safety (e.g. responding to a long or strong earthquake) which may be informed by Emergency Mobile Alerts (where power and telecommunication networks allow).

- **There will be significant and long-term environmental impacts.**

Fuel, chemicals and hazardous materials (e.g. human waste, milk waste) may be leaked during the earthquake and/or tsunami, leading to environmental damage but also health and safety risks for responding agencies.

A large amount of debris, e.g. building facades, harmful materials-asbestos, soil and rock, will be generated by this event, altering and in some cases harming the environment. This debris may block transport routes reduce the mobility of responding agencies.

- **National and regional assembly areas will be established in accordance with national and regional plans.**

The NCMC will direct Regional Assembly and Staging Areas (Air and Sea) to be established to enable the storage, organisation and mobilisation of resources required by the response. The locations to be used will be assessed for damage following initial and follow-on impacts

- **Offers of international assistance will be made and coordinated through the NCMC.**

Offers of or requests for international assistance will result from this event. These will be managed by MCDEM and considered by the National Security Committee of Cabinet (NSC), via the Officials Committee for Domestic and External Security Coordination (ODESC) system

Appendix 3 – Hikurangi subduction earthquake and tsunami event action plan

Event name:	AP Number:
Hikurangi Subduction earthquake and Tsunami	1
Operational period from:	Coordination facility:
	Wellington Region Group Emergency Coordination Centre
Operational period to:	Controller:

Summary of Incident / Event: (A summary of the hazard impacts, environment and response actions to date, including the most dangerous and most likely hazard scenarios. This is based on reconnaissance and status reports.)

- Mw 8.9 earthquake occurred on the Hikurangi subduction zone **at enter time and date here**. The earthquake was centred on **the central** portion of the Hikurangi subduction zone.
- A large tsunami was generated by the earthquake; the first wave arrived on the Wellington southern coast at **Enter time of arrival here** and Wellington inner harbour at **Enter time of arrival here**; waves will continue for up to 24 hours. Large numbers of people have self-evacuated inland and to higher ground. An 'all clear' to return into the tsunami evacuation zone will not be issued until the risk of further inundation has abated.
- Impacts are not limited to Wellington Region, with damaging shaking experienced, and associated tsunami impacts across the North Island and top of South Island limiting the capacity of other CDEM Groups to support response in the worst hit areas.
- Ongoing aftershocks and associated tsunami continue-limiting the ability of emergency services to assist the trapped and injured within the tsunami evacuation zones.
- There is a large amount of isolation due to physical barriers and unavailable comms. This isolation applies to communities, resources and emergency services.
- The impact to engineering lifelines and transport nodes/links has been severe. There is limited communication, electricity and potable water.
- Many persons are displaced overwhelming the capacity of welfare systems to cope. These people have urgent and unmet needs such as food, water, shelter and clothing.
- The DHB is overwhelmed with the amount of injuries presenting at primary and secondary health centres. Medical supplies are limited, and generators will be required to continue operating.
- This event is unprecedented, provision of life safety advice and reassurance is paramount to maintaining public order and saving lives as secondary hazards continue.

Mission: (Mission Statement.)

The Wellington CDEM Group initial regional response for a major earthquake and tsunami generated by the Hikurangi subduction zone will be mobilised in an appropriate and timely manner to coordinate essential support to Wellington's regional population in order to minimise loss of life, provide for the immediate needs of the affected people, mitigate hazards and retain public confidence.

Intent: (Give the intent, best stated as a concept, key tasks and end-state. It is a broad statement of what must happen and when.)

The intent of the WREP and this appendices is to provide sufficient guidance to the Wellington CDEM Group to enable achievement of the mission identified above. The risks presented by a major earthquake and tsunami affecting Wellington cannot be eliminated, but they can be reduced through comprehensive planning and preparation beforehand, and by prompt, proactive and coordinated response actions. The Wellington CDEM Group will automatically activate their usual or alternate response coordination and emergency centres in accordance with the WREP without waiting for central direction. The immediate response objectives are to:

- Gain timely situational awareness of the earthquake's impact
- Make appropriate decisions that will preserve life and care for the injured, sick and vulnerable people
- Provide immediate humanitarian needs (shelter, water, food and healthcare) to people in the affected areas
- Maintain law and order
- Coordinate multi-agencies responses
- Provide responder access into and evacuee egress from affected areas
- Prevent further casualties through reduction of hazards/risks
- Enable ongoing communication with all affected communities
- Minimise escalation of the consequences of the emergency; and
- Provide public information services to the community and the media, by all means available.

Designated Tasks: (Specific tasks and timings for each agency under the plan.)

Wellington Region CDEM GECC

- Ensure that responding agencies are kept alerted and informed with regards to the event and its impacts
- Coordinate the provision of emergency information to the community to reassure and support response activities
- Establish the GECC and communications to support the sharing of information between responding agencies
- Support the displaced population through the coordination of rapid relief and emergency shelter
- Coordinate the collection and analysis of information to inform situational awareness across all responding agencies
- Coordinate the collection of welfare needs information
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons
- Coordinate the Group-wide response planning process
- Coordinate and manage the acquisition and prioritisation of response resources and emergency welfare resources

Local Authorities / EOC's

- Coordinate the provision of emergency information to the community to reassure and support response activities
- Establish communications to support the sharing of information between responding agencies
- Support the displaced population through the coordination of rapid relief and emergency shelter
- Gather, analyse and disseminate information to develop a clear understanding of the event and its impacts within the district / city
- Coordinate the collection of welfare needs information
- Identify areas for managed evacuation and exclusion and coordinate the implementation and management of cordons
- Coordinate the local response planning process
- Coordinate and manage the delivery of local response resources and emergency welfare resources

- Conduct lifeline utility damage assessments and establish temporary arrangements for water distribution
- Clear key routes within district to enable response activities to occur
- Respond to public health issues as situation allows

New Zealand Police

- Establish NZ Police response coordination facilities
- Carry out evacuations of identified areas as requested by the Wellington Region CDEM GECC
- Establish and maintain access control measures into evacuated areas
- Maintain law and order
- Support rapid impact assessment process
- Support Fire and Emergency New Zealand USAR activities
- Establish Inquiry and Disaster Victim Identification (DVI) process

Fire and Emergency New Zealand

- Activate and establish FENZ response coordination centres
- Coordinate USAR operations in impacted areas as situation allows
- Establish rapid impact assessment process where safe to do so
- Continue to respond to fire and hazardous substance events as per BAU responsibilities

Wellington Free Ambulance, Capital and Coast DHB, Hutt Valley DHB and Wairarapa DHB

- Attend to urgent medical needs as situation allows
- Support Fire and Emergency New Zealand USAR activities
- Activate all operable medical facilities to support management of casualties
- Establish temporary morgue facilities
- Support on-going medical needs of population

Welfare Agencies

- Support the provision of rapid relief to the impacted population
- Support the rapid impact assessment process and the collection of community impact information

Te Puni Kōkiri (national and regional offices)

- To work with other government agencies and CDEM Groups to facilitate and co-ordinate support to Māori who require assistance, and to engage with iwi, hapū, whānau, and Māori communities to ensure their needs are met.
- To coordinate links with Iwi organisations to Māori communities to provide key emergency information and status reports

Lifeline Utilities Agencies

- Ensure key routes are cleared and alternate routes established where access is no longer possible to support response activities
- Establish access to emergency power supplies and re-establish electricity network where possible to do so
- Establish temporary access to communications

Limiting Factors: (Matters that may or will limit options, timeframes, or outcomes.)

Matters that may or will limit options, timeframes and/or outcomes:

- Emergency services and USAR resources are limited
- Emergency Services are limited in their ability to carry out initial action plans in tsunami evacuation zones by the ongoing threat of tsunami
- Food and potable water supplies are limited within the Group
- Damage to the medical supply chain combined with a stretched health service (low staff numbers and high community demand) is leading to worsening health outcomes,
- Damage to power and telecommunication infrastructure is limiting the effectiveness of multi-agency coordination,
- Damage to transport infrastructure, e.g. from liquefaction or lateral spreading, is limiting the mobility of responding agencies around the region,
- Significant numbers of displaced people,
- The ability to sustain the immediate and basic needs of affected populations,
- Availability and ability of critical personnel to get to key areas e.g. engineers to certify use of assets & key medical staff to get to key medical facilities.
-

Coordination Measures: (Times, locations, boundaries, and other measures designed to coordinate the response.)

- The Group Emergency Coordination Centre is established at [REDACTED] and is operating 24/7
- The following local EOC's are established and operating 24/7:
[REDACTED]
- ESCC meetings are occurring via satellite phone at [REDACTED] daily
- GECC IMT meetings are [REDACTED] daily
- Sitreps are released [REDACTED] daily
- Status Reports are required from all agencies by 1400hrs daily

Resource Needs: (Who will provide what and when they will do it – including: information, supply, personnel, equipment and transport.)

The Wellington Region CDEM Group requires assistance as soon as possible in the form of:

- Food, water, medical supplies and emergency shelter
- Fuel and generators
- NZDF and International Defence Forces support for logistics and operations (ships, helicopters, terminal operations teams, fuel delivery systems, water purification etc.)
- CDEM staff for GECC
- Surge support from the emergency services (incl. USAR and DVI specialists)
- Surge support from other responding agencies and organisations
- Medical staff and facilities

- Building and transport infrastructure assessors including technical experts for the detailed inspection of buildings and structures
- Assets to enable reconnaissance
- Assets to enable reconnaissance

Information Flow: (Who needs to know and who has information we need? May include key information requirements, or they may be attached.)

Information inputs:

- Warnings and alerts from NEMA / GNS
- Situational awareness information gathered from rapid impact assessments, community and status reports
- NCMC Action Plan and situation reports
- Resource requests

All status reports to be sent to: [REDACTED]

Information outputs:

- Public information and alerts / warnings to responding agencies and public
- Situation reports
- Action Plan
- Resource requests to NCMC
-

Public Information Plan: (Outline of intended public information processes and outputs. This may be attached.)

Establish a regular schedule for the provision of warnings, life safety advice, information regarding the situation and reassurance regarding the response. Public communications will use consistent messaging guides where possible.

If standard telecommunications are not working, alternate means of communicating will need to be utilised.

Communications Plan: (Frequencies / purpose / coverage, role cell phone numbers communications schedule, etc..)

The Group ECC will utilise UHF/VHF channels [REDACTED] conduct communications with responding agencies

Where possible, this will be supplemented by satellite communications (voice and IPStar [data]) as available. The Group satellite phone numbers are as follows:

Facility	Address	Landline	Mobile	Sat. Phone
Wellington Region Emergency Coordination Centre	2 Turnbull Street, Wellington	[REDACTED]	[REDACTED]	[REDACTED]
Wellington EOC	2 Turnbull Street	[REDACTED]	[REDACTED]	[REDACTED]
Hutt City EOC	25 Laings Rd, Lower Hutt	[REDACTED]	[REDACTED]	[REDACTED]
Upper Hutt EOC	838–842 Fergusson Drive, Upper Hutt	[REDACTED]	[REDACTED]	[REDACTED]
Porirua EOC	2B Raiha Street, Porirua City	[REDACTED]	[REDACTED]	[REDACTED]
Kapiti EOC	Fytfield Place, Paraparaumu	[REDACTED]	[REDACTED]	[REDACTED]
Wairarapa EOC	64 Chapel Street, Masterton	[REDACTED]	[REDACTED]	[REDACTED]

Appendix 4: Supporting diagrams

The following diagrams are based on the credible planning scenario and support the response concepts included this paper and in Volume II of the Hikurangi Response Planning toolbox. Please note the following diagrams are ‘examples’ only and are based on the credible planning scenario. They do not reflect planned response arrangements between the five CDEM Groups (Bay of Plenty, Tairāwhiti, Hawke’s Bay, Manawatū-Whanganui and Wellington) and estimated lifeline impacts require further refinement as part of regional response planning.

Figure 1: Inter-regional support (overleaf)

Following a large Hikurangi event it is likely some CDEM Groups may not have the capacity or capability to coordinate the response in one or more of their communities, requiring another CDEM Group with the capability and capacity to help by coordinating beyond its boundaries, for example, where a physical barrier, such as a landslide, may be isolating a community. Coordination across boundaries may also be necessary to achieve an effect, e.g. reconnaissance of an asset.

The decision for a CDEM Group to coordinate the response in a community beyond its boundaries would be a joint decision between the two CDEM Groups involved and would be in consultation with the National Controller and appropriate stakeholders.

Additionally, it is important to note some agency boundaries, such as NZ Police and Fire and Emergency NZ (FENZ) regions, do not align to regional council boundaries. Engagement and response planning with these agencies therefore requires a coordinated approach between the CDEM Groups and the agencies involved.

The requirement for national CDEM support and coordination should be identified and planned for where regions do not have the capability or capacity to meet response requirements themselves, or with direct coordination with adjacent regions.

Figure 2: Response Islands (overleaf)

This figure demonstrates the ‘response island’ concept at a regional scale, adapted from the Wellington Region Earthquake Plan (WREP). Please refer to the WREP for further information about response islands specifically in a Wellington context.

Following the credible scenario, landslides and/or damage to roading infrastructure is anticipated to isolate Tairāwhiti, Hawke’s Bay and Wellington regions, effectively creating ‘response islands’.

Until inter-regional road connections are restored, these regions will need to use alternate means (e.g. ships/planes) to fly people and resources into and out of the region.

Figure 3: Lifeline impacts – utilities (overleaf)

The figure below shows the estimated availability of lifeline utilities within the first seven days following the credible scenario. In the worst affected CDEM Groups, it is likely there will be no power, telecommunications, wastewater or potable water available within the first seven days following the credible scenario. It is important regional response planning plans for a response where these services are not available for a prolonged period of time.

Figure 4: Lifeline impacts – transport infrastructure (overleaf)

The figure overleaf shows the estimated damage and restoration times for transport infrastructure following the credible scenario. As shown in the figure, a large Hikurangi event could significantly affect inter-regional road connections, regional airports and ports. Significant damage or loss of this critical infrastructure would affect the way CDEM Groups respond to a large Hikurangi event and should therefore be considered as part of regional response planning.

Figure 1: Inter-regional support

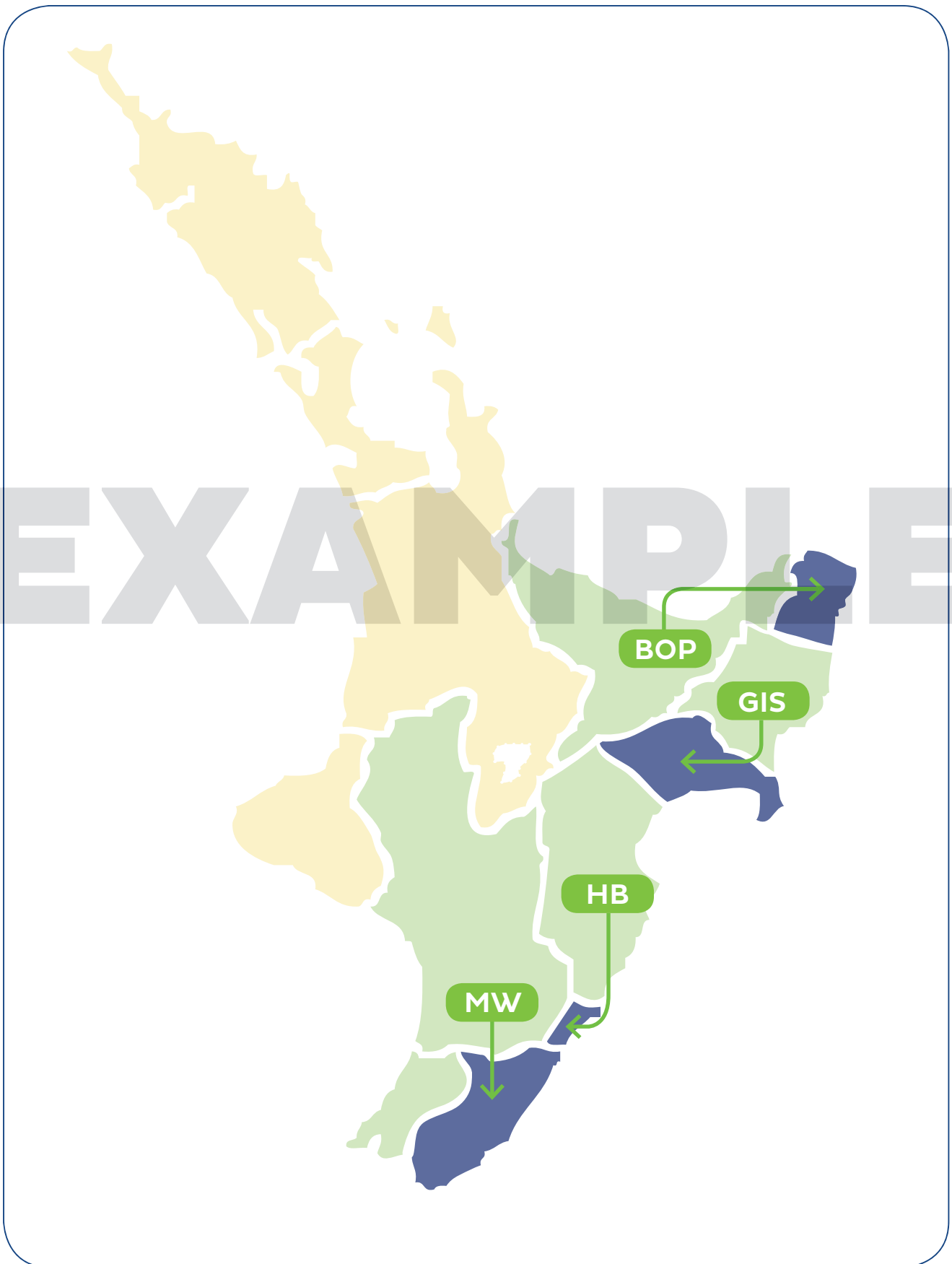
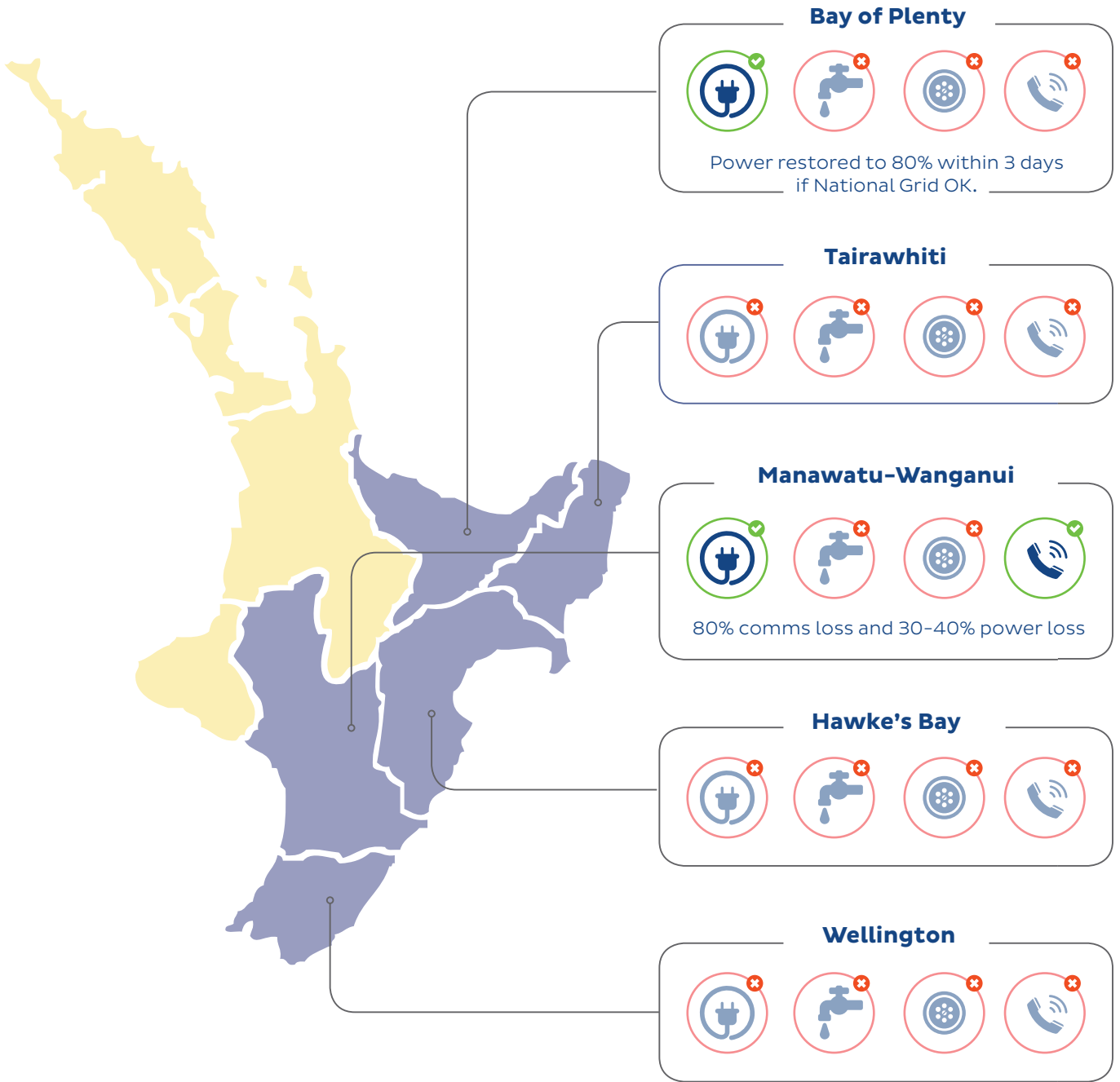


Figure 2: The 'island' concept



Figure 3: Example of lifeline utility availability in the first seven days following credible scenario



KEY

- Power
- Potable water
- Waste water
- Telecommunications

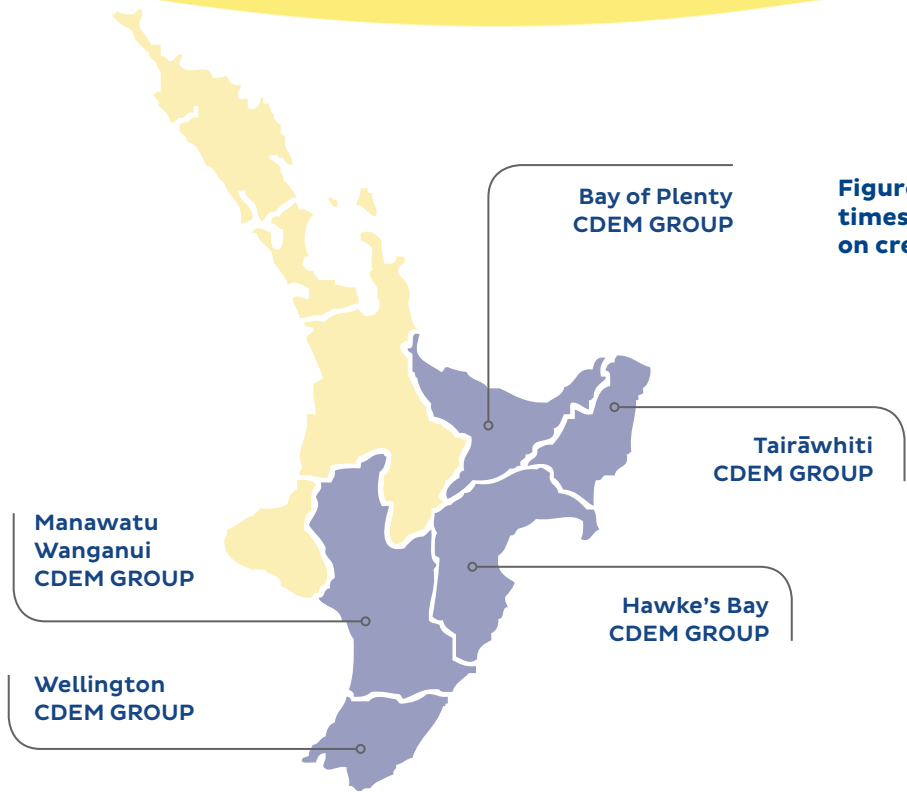


Figure 4: Example of estimated restoration times for logistics links and nodes (based on credible planning scenario).

- Available following inspection
- Available within EQ +7 days following repairs
- Significant damage. Long restoration times
- Permanently non-operational

	Inter- regional road connections	Regional Airports	Ports
	Waikato CDEM		
Bay of Plenty CDEM GROUP	Road restoration between regions 30+ days	Tauranga Airport Fixed wing	Port of Tauranga Geared Ships RORO capable
Tairāwhiti CDEM GROUP	Road restoration between regions 30+ days	Gisborne Airport Fixed wing	Eastland Port Geared Ships
Hawke's Bay CDEM GROUP	Road restoration between regions EQ + 7 days	Hawke's Bay Airport Bridge Pa Aerodrome Light Aircraft	Napier Port RORO capable* and geared ships <small>* Mediterranean mooring possible</small>
Manawatu Wanganui CDEM GROUP	Waikato + Taranaki CDEM	Ohakea Airbase Rotary wing military fixed wing Palmeston N. Airport Fixed wing	Whanganui Port Small geared vessels
Wellington CDEM GROUP	Road restoration between regions 30+ days	Wellington Airport (EQ +2) Civillian and military fixed wing	Centre Port (E +5) RORO and geared ships