

MAYOR'S FOREWORD

I commend to you **THE GISBORNE CDEM GROUP TSUNAMI CONTINGENCY PLAN**. Planning is the most crucial tool in the success of any activity even more so in those that happen infrequently.

I take this opportunity to thank the 'team' for putting this plan together for all of us. It has been achieved with minimal resources but is still able to provide a valuable resource for planning, dealing with and recovering from emergencies.

I can say that the Plan should give us more confidence that the Group will be able to cope with an emergency BUT the overall success still depends on the majority of the public being prepared and able to cope without assistance.

I have every confidence in our staff and our trained civil defence coordinators in our region, that all our planning and training will lessen the trauma in case of an emergency.

Our team has experience with Cyclone Bola and the close calls we have had since. This has meant that the team that developed the Plan has reality based knowledge and experience behind them.

But even so we should still not be complacent as the impact of any event can still provide the unknown and in reality Bola was a small emergency.

We have a good group of civil defence volunteers (community link) ready to provide leadership in an emergency, a good communication infrastructure ready to communicate with the remote parts of our region and our Council will continue to provide funds to ensure that a reasonable level of preparedness is maintained and a response structure is in place.

As long as communities prepare to a credible level and 'organisational' support is maintained we should be able to cope with the majority of disasters that the region can expect.

Meng Foon
Mayor
GISBORNE DISTRICT COUNCIL

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1.0 INTRODUCTION

The purpose of this plan is to provide procedures, to be used as a guide, when the Gisborne District has warning of a distantly generated tsunami or for a timely response to a locally generated tsunami.

To achieve this, the following factors are considered as the priorities to achieve a successful outcome and minimal casualties

- pre-event public education
- co-ordinated response and use of resources
- warning procedures
- dissemination of information to the public
- communication systems

This plan only recognises 2 threats that will require a significant level of co-ordination – one generated off the West Coast of South America, Peru and Chile, and a local event generated off our coast.

There is not considered to be a regional threat to the Gisborne District, but it is likely that a small scale activation may be required to manage information going to the media.

This plan is also supported by the National Tsunami Plan and the Adverse Events Plan.

2.0 RESPONSIBILITIES

Individual emergency services are responsible for maintaining their own action plans required to mitigate, prepare for, respond to and recover from a Tsunami event. These action plans will need to consider the overall co-ordination requirements of this plan.

This Contingency Plan will be maintained by the Emergency Management Office.

Event Management Team the following are the basic management team for any tsunami event, (others may be co-opted as necessary) and will have overall responsibility to develop the CDEM Co-ordination Plan.

- Controller,
- Manager Emergency Management,
- Police,
- Fire,
- Medical Officer of Health,
- St John,
- PRFO,
- EIL/Port Company,
- Transit/Opus, and council roading
- Media Team Leader,
- Lifelines Co-ordinator,
- District Welfare Manager and
- GDC CEO and Mayor if required

2.1 Warning System Responsibilities

MCDEM – The Ministry of Civil Defence & Emergency Management is responsible for receiving the information from the Pacific Warning Centre and passing it to the Gisborne EMO for further action.

MCDEM receives PTWC information to New Zealand and assess the risk before issuing an Advisory or a Warning.

- National Tsunami Advisory – heads-up message that there is no threat or there is a potential threat
- National Tsunami Warning – Tsunami threat imminent and likely significant - more details to follow.

MCDEM is responsible for alerting the national and international media.

On receipt of the national information the EMO is responsible for ensuring all partners and the public are aware of the threat.

2.2 Emergency Management Office (EMO)

The EMO has the responsibility of implement/initiating the provisions of this plan either for a distant or local event. This includes,

- the establishment of an appropriate GEOC,
- warnings,
- briefings,
- media releases,
- updating MCDEM,
- establishment of welfare centres and
- overall event co-ordination whether it is declared or not.

The EMO is responsible for analysing the extent of the threat to the district and initiating the appropriate response. This action must be conveyed to the public as the only 'official' information they should be acting on.

2.3 New Zealand Police

Statutory responsibility for the enforcement of law and order remains with the NZ Police at all times. Requirements for specific police functions prior to, and during, an emergency are stated within the Civil Defence Emergency Management Act 2002 (Sec 63), and detailed in the National CDEM Plan 2005 (clause 22) and the Gisborne CDEM Group Plan. Some of the major roles that Police are expected to plan for, and undertake, during a Tsunami emergency include the;

- protection of life,
- warning those at risk and assisting with evacuations,
- identification of casualties,
- missing person procedures,
- implementing the traffic management plan (TMP),
- security of evacuated areas.

Police will also utilise and co-ordinate Surf Life Saving and Coastguard assets if required for sea search and rescue/recovery.

2.4 Fire Service

Statutory responsibility for emergencies for the NZ Fire Service are detailed within the Fire Service Act 1975 and Civil Defence Emergency Management Act 2002 and the National CDEM Plan. In brief they relate to fire fighting, temporary water supplies and the rescue of trapped people. In a Tsunami event, assistance with warning and evacuation of the public for a potential Tsunami or assistance with the rescue and recovery of casualties after an event.

NZFS Coastal Brigades will assist with the warning process and assistance with the rescue and recovery of casualties after an event.

2.5 Tairāwhiti District Health

Statutory responsibilities for preparatory and response measures for Health Agencies during an emergency are detailed within the Civil Defence Emergency Management Act 2002, National and Civil Defence Emergency Management Group Plans. In brief they relate to public health and medical issues and to providing triage and care for trauma patients and transport of casualties.

2.6 Community Link

On the coast the Te Araroa and Waiapu Area Co-ordinators will manage the response for their respective communities and report actions to the GEOC.

Within the Gisborne Area coastal communities will take their direction from the GEOC and work with the emergency services to carry out the warnings and evacuations.

2.7 Rural Fire

The Gisborne Rural Fire Team will assist with notification to evacuees, cordons and search and rescue. This will generally be under the leadership of Police or Fire

2.8 Life Lines

Essential industries (including utility companies and the Gisborne District Council) have a statutory responsibility for the maintenance and delivery of essential services such as power, gas, roading, telecommunications, water, drainage and sewerage system though this may be at a reduced level (CDEM Act 2002 Sec 60).

As such they are responsible to prepare and maintain their own contingency plans to mitigate, prepare for, respond to, and recover from the effects of any Tsunami emergency within the Gisborne District. Main threats are to power lines along the coast from Tatapouri to Pouawa and the SH35 system and local road networks.

2.9 Government Agencies

Statutory responsibilities and functions of Government Agencies, both prior and during an emergency, are stated within Civil Defence Emergency Management Act 2002 (Sec 58) and are detailed in the National CDEM Plan 2005 (clause 18) and the Gisborne CDEM Group Plan. This generally involves the continuation of service to the public and participation in welfare centres.

MCDEM is responsible for receiving, analysing and disseminating any warnings to CDEM Groups.

2.10 Transport Management Plan (TMP)

The Controller will be responsible for deciding which tier TMP (there are 3 relating to the level of threat) will be used and this will then be implemented under direction of the Police. They will be assisted by OPUS, Council and their respective contractors. The deployment will be managed from the YMCA.

2.11 Welfare

Most care agencies and voluntary organisations already have a role in the response to local community needs during an emergency. They are recognised in the Group Civil Defence Emergency Management Plan and are responsible for preparing and maintaining their own contingency plans to ensure they fulfil their role during any

event. However central co-ordination will be required for some welfare activities, such as emergency housing and Psychological Support Mechanisms.

2.12 Media

The key function of media (both electronic and print) will be to keep the public informed and well advised during the event. News releases will be co-ordinated centrally from the GEOC. Local media representatives must be brought into the loop within an hour of receipt of confirmed warning. The Council website also becomes an important tool during an event.

2.13 Event Monitoring and Impact Reports

For a distant Tsunami, warnings and updates are passed directly to Ministry of Civil Defence & Emergency Management (MCDEM) in Wellington from the Pacific Tsunami Warning Centre. Whether the event is confirmed, information concerning it is passed to CDEM Groups, (EMO in Gisborne) the Police Communication Centres and the Media. Release of information within the Gisborne District is subject to the guidelines in this Plan and/or decisions made by the management group. The GEOC also monitors the Pacific DART buoy's, International media and the NZ tidal buoys.

After any impact the EMO or the GEOC will establish through the Coastal Rural Area Co-ordinators, civil defence community link and the emergency services, the extent and impact details of any Tsunami.

Collated information will be passed to those listed in para 3.5 plus MCDEM.

Key triggers for decision are arrival times and heights at Easter Island (8hrs to NZ, **NB** Easter island is 18 hrs behind us in time) and the Chathams (1.5hrs to NZ, **NB** the Chathams are 45 minutes ahead of us in time)

3.0 OPERATIONAL PRIORITIES/STRATEGIES

3.1 Established Priorities and Strategies

Established priorities during any Tsunami event will be:

- the safety of people and protection of people through public education, timely warnings and managed evacuations.
- the assessment of impacts and timely recovery.

Unless the size of the Tsunami event dictates otherwise, general strategies for the management of a confirmed event will be:

- To evacuate people (for up to 10hrs after first impact in a distant event) in the "at risk areas" shown on the maps or through education encourage self evacuation for local events (for about an hour). The minimum requirement if there is no evacuation map is 2km inland OR 20m's above sea level.
- To co-ordinate all matters relating to restoration after an event, so as to return the local community back to normal as quickly as possible.

3.2 Group Emergency Operations Centre (GEOC)

The risk to the GEOC from Tsunami inundation leaves some uncertainty as to its use although this has been alleviated somewhat by the results of the inundation report. If there is a confirmed significant threat to the GEOC then the Health Board Boardroom on the 2nd floor of the Morris Adair building will become the GEOC.

Local Tsunami

If an event occurs outside normal work hours, the condition of the GEOC will be assessed as to its suitability, if there is substantial damage the alternate GEOC will be used. If a large (MM8 or greater) or long duration earthquake occurs during work hours (and the office is occupied) the GEOC cannot be abandoned immediately. However preparations will be made for a quick withdrawal. If practical an observer will be sent to Kaiti Hill or an air asset used to see if a Tsunami is generated.

Distant Tsunami

The EMO will be activated as the GEOC and used for the planning and implementation of the evacuation. During this phase consideration will be given to move to the alternate site. If the reported height at the Chatham Islands is greater than 10 metres then preparations will be made to relocate the GEOC. (there is approximately 45 minutes until the Tsunami arrives in Gisborne from the Chatham's. The first surge will not pose a risk but subsequent ones may, (there will be around an hour between each). Some decisions could also be made re this relocation, after the impact on Easter Island (8hrs). Credible worst case modelling shows that the GEOC is not at risk from inundation

3.3 Initial Actions

Local Tsunami

The only warning the public will get will be a "long duration earthquake" or an earthquake of significant size. All agencies initial actions are to remain safe and protect assets from the earthquake. Those in potential impact areas may move resources to safe areas after the shaking stops.

There is a danger of individual agencies deploying 'piecemeal' to 111 calls, which may mean that resources are not available for the worst affected areas. They may also put themselves at risk if responding before the event is over. Senior staff from each agency must meet ASAP after the earthquake to set priorities of response.

Distant Tsunami

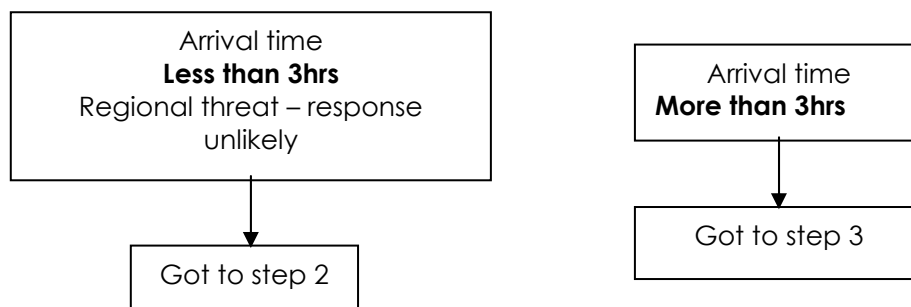
The Pacific Tsunami Warning Centre in Hawaii provides a service for the whole of the Pacific Rim and is able to forecast the potential for/confirm the presence of Tsunami.

This information is passed to the MCDEM who in turn pass it to the EMO and the Police. The EMO then has the responsibility to take the appropriate actions. Actions should be guided by the following steps;

Step 1 Whether from email, fax or phone the following information is sought; this can be copied straight on to the form at **annex f** or transferred later. This information should be preceded by an SMS – the phone call is likely to come after the electronic notification

- the date and time of call

- callers name and title (whether first or to confirm receipt of electronic message)
- expected time of wave arrival
- expected height (assess impact of current tidal status)
- location of source and event that caused it
- any further co-ordination detail



Step 2 It is not considered that the Gisborne District has a regional threat it is unlikely that any action will be taken under this scenario. If it does, the threat is likely to be significant and imminent. Formal procedures will need to be modified if any realistic action is to be taken to protect public safety. The following procedures will be followed by the Emergency Management Office if there is considered to be a threat;

- Depending on the threat contact the 2 coastal Area Co-ordinators and ask them to activate their personnel to start clearing the at risk areas. The Cities risk is not as urgent as the coastal Areas but they should be contacted and put on alert.

Area Co-ordinators	Contact	Number
Te Araroa	Hal Hovel Alt Jim Mill	06 864 4823 06 864 4853/881
Waiapu	Paul Sollitt Alt Hori Hern	06 864 8467 021 0267 6961
Gisborne Community		
Tolaga Bay	Pop Milner Nori Parata	021 359 906 027 320 9791
Whangara	Peter Gibson	862 2088
Wainui	Ray Veall	867 6017
City	Brian Shepherd	868 8940/867 3541
Manutuke	Butch Pardoe	027 262 1866
Muriwai	Dawn Pohatu	021 661 366

- Immediately contact the Event Management Team (see 2.0) and request their attendance at the Emergency Management Office.
- Contact someone able to declare an emergency and ask them to attend the Emergency Management Office.
- Ensure Port Eastland is aware of warning
- An immediate decision will need to be made on whether to declare and confirm the areas to be evacuated. This decision will be influenced by the time available and the direction the wave is coming from. The Police will need to play a major role in the evacuation of the designated areas to ensure the message is enforced with the public in the at risk areas.
- As a concurrent activity (if it is a weekday) have someone call the schools and childcare facilities in the following list

Key Schools and Childcare Facilities			
Wainui & Playcentre *Nolian Andrew *Margo	867 7160 0210277 848 0272359 612	Gisborne Child Care *Wendy *Fleur (2 I/C)	867 7565 0273306 643 021 775 737
Tolaga Bay *Nori Parata	862 6765 0273209 791	Awapuni *Principal	868 6660 027243 8152
Tokomaru Bay School Playcentre	06864 5818 06864 5816	Rangitukia *No Alternative Numbers	06864 3850
Tokomaru Bay Kura *Francis	06864 5656 021 298 513	Tokomaru Kohanga Pakirikiri 3 Waima Rd	06864 5645 06864 5756
Waipiro Bay	06864 6808	Hicks Bay	06864 4616
Rerekohu	06864 4853	Muriwai Kohanga Reo	862 8891
Victoria Child Care *Lisette	867 3853 0276007 226	Whangara School	8622 806

*Alternate phone numbers if school number is busy.

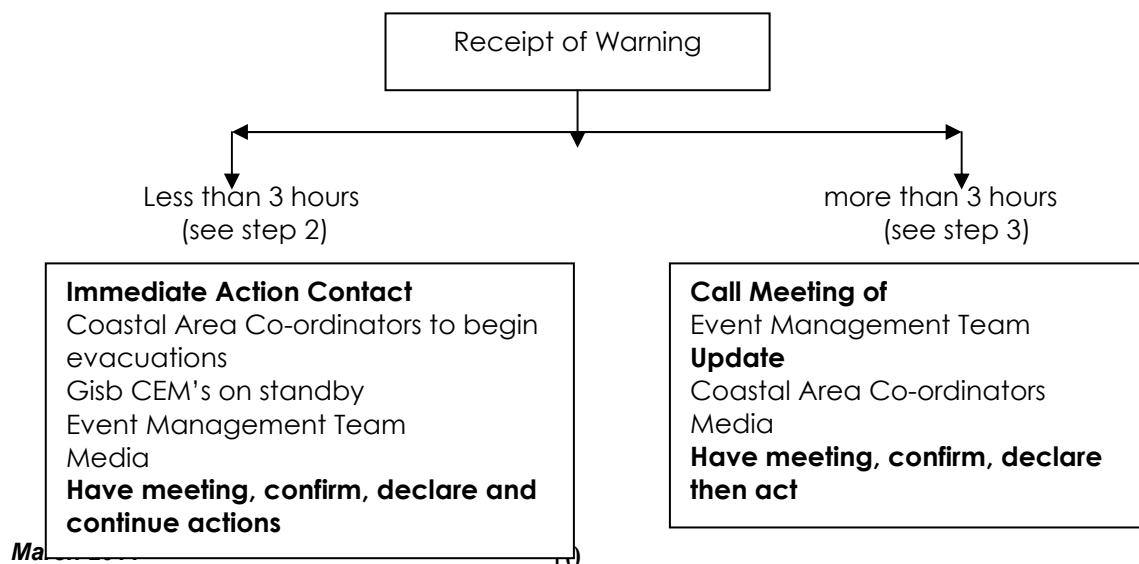
- Call Radio Network, Media Centre and RNP to give them the details and timings to broadcast or page 27 of the Media Scripts document they already have. (see media section 5.6, for phone numbers and procedures)
- Establish GEOC.

Step 3

- Contact the Event Management Team with the time and venue for a meeting. (see 2.0)
- Put coastal Area Co-ordinators on standby (they should start contacting their Community Emergency Managers) and Gisborne Community EM (see table in step 2)
- Contact local media with initial message and ask them to keep broadcasts about event to minimum and wait for instruction, they should tell public to stay put and listen to the radio for information.

Any further actions required will develop from the Emergency Management Team meeting.

3.4 Action Summary for Confirmed Event



3.5 Emergency Management Office (EMO)

The EMO is responsible for initiating the appropriate response to the level of warning received. The alerts and warnings are received by the EMO and will be passed on to those listed below as required by the threat scenario.

- Civil Defence Controller
- New Zealand Police
- New Zealand Fire Service
- PRFO
- Health
- St John
- Area Co-ordinators
- Community Link
- Chief Executive - GDC
- The Mayor
- Engineering & Works, Environment & Planning
- Eastland Infrastructure and Port
- OPUS/NZTA
- Media

A summary of the evacuation actions are shown at annex e.

4.0 EVENT MANAGEMENT

4.1 Declaration

If a locally generated Tsunami impacts anywhere on the coast of the Gisborne District and there have been obvious casualties a declaration of state of local emergency will be considered.

If it becomes apparent that a distantly generated Tsunami is going to impact on our coast and the information indicates that large scale evacuation is necessary, then there will be a declaration of state of local emergency.

4.2 Distant Event – pre impact (see annex b for action plan/check list)

The only risk is from the west coast of South America.

Three levels of evacuation for City – dependant on threat

- Level 1 – beach only – indicative earthquake less than 9
- Level 2 – Waikanae Creek – indicative earthquake 9 – 9.3
- Level 3 – Kahutia St – indicative earthquake above 9.3

On receipt of a warning the Event Management Team will meet in the GEOC to develop the CDEM Co-ordination Plan.

If the earthquake was 9 or above on the Richter scale and the generation of a tsunami is confirmed then evacuations in the city (including Muriwai) and coastal communities from Wainui to Hicks Bay will be confirmed by the planning team. The areas to be evacuated will be based on the level of threat, using the evacuation maps and Inundation report to assist the decision.

One of 3 levels will be selected for the City which will trigger the relevant TMP.

As a general rule the earthquake will need to be above 9 on the Richter scale to require more than a 'stay of the beach' message.

Once the decision is taken to evacuate, the road blocks will go in as soon as practical after the receipt of the warning (residents will be allowed in and out until 3 hours before impact.) The evacuations will begin 6 hours prior to the expected arrival time. The TMP should be timed to be in place to before the evacuations begin.

If the event does occur then it is likely the evacuation order will stay in place for at least 8 hours after 1st expected impact or until it is obvious that there is no longer a threat. A distant event will have multiple waves, the biggest in 1960 was some 8 hours after the first, the harbour was subject to seiching (prolonged period of undulating waves) for 3 days.

The key decision as to whether to evacuate could be delayed until after information is received from Easter Island which will give an 8 hour lead time. However this is only likely if the earthquake is less than 9 from the South American continent.

Emergency Management Office Role establish an appropriate GEOC to co-ordinate response requirements including authorising all CDEM Group media releases.

The relevant community link organisations will be activated to notify the public in the at risk areas on the coast and city, to evacuate and where they should go.

Any media releases concerning evacuations and information about the event will be co-ordinated and released by the GEOC.

The GEOC will be responsible for opening and staffing welfare centres where necessary. Evacuation centres for areas likely to be evacuated are shown at annex c. Registration of all those evacuated will be a priority. Self-evacuation to family and friends will be promoted as the preferred option.

Police Role

In Gisborne City and Wainui, the Police will manage the implementation of the TMP and the evacuation process. There may also be a need to provide some security patrols in the evacuated areas.

In the rural coastal areas where there are Police available, they should work with the Community Emergency Managers and Fire Service to effect the evacuations.

Gisborne Marine SAR assets and personnel be under Police control for possible deployment.

Fire Service Role

Subject to operational priorities, the NZ Fire Service will assist with the notification in Wainui and the City, to the public in the at risk areas of the need to evacuate. In an extreme event re-deployment of resources from Bright St will need to be considered.

In rural coastal areas, where there are Fire Service resources, they should assist the Police and Community Emergency Managers notifying the public in the at risk areas.

Medical/Health Role

St John provide transport assistance for any infirm or elderly and may accompany evacuation teams.

The DHB is responsible for providing health priorities to the Controller, participation in overall planning and implementing plans to remove key health resources from potential impact areas.

Gisborne Rural Fire Team Role

The rural fire team will provide those resources that are available to assist Police and Fire with the evacuation of designated areas in the City and Wainui.

4.3 Distant Event – after impact

If there is significant inundation and once the area is safe, normal recovery procedures and processes, as detailed in the Recovery Plan, will take over.

Traffic control measure will be reviewed and more permanent barriers put in around the inundated areas.

4.4 Locally Generated Event - after impact

Once it becomes apparent that a locally generated Tsunami has struck any part of the coast reconnaissance will take place to ascertain when the event has finished. Tsunami events rarely consist of only 1 wave (although local events will probably have a maximum of 3-4 waves) and often the first wave is not the largest.

Attempted rescue or evacuation before there is certainty that the event has finished may only result in more casualties.

Once there is certainty the event has finished search and rescue will commence. This could include the establishment of forward triage units once the worst impact areas have been identified.

As soon as an impact has been confirmed a helicopter will be dispatched to monitor the progress of the event.

Individual agency responsibilities

Emergency Management Office Role establish an appropriate Emergency Operations Centre to co-ordinate response requirements including authorising all media releases. The relevant community link organisations will also be activated to provide assistance and gather information on the extent of the damage and casualties. Welfare of the 'survivors' will be a priority and while registration of those affected should be done ASAP, some sensitivity will be required. Also ensure a co-ordinated response is occurring on the coast.

Police

- provide traffic control in the impacted areas
- facilitate the movement of any resources into the area.
- search and rescue co-ordination and institute missing person procedures.
- co-ordinate the deployment of Gisborne Surf life saving assets.
- Police DVI Team may also need to be deployed.

Fire Service Subject to operational priorities, any resources that are available for deployment to the impact area will assist with medical recovery and rescue.

Medical/Health Role

St John provide transport for casualties to whatever medical facility that has been established to treat the patients and to provide available paramedics/trained first aiders at triage points or for casualties before they are moved from the impact site.

The DHB is responsible for coordinating the provision/establishment of appropriate staff and facilities to treat casualties and provide health advice to the Controller where infrastructure has been affected that may impact on public health.

Gisborne Rural Fire Team Rural Fire Fighters will assist Police with cordons and the rescue team will assist Police and Fire with search and rescue in impacted areas.

4.5 Communities requiring evacuation

The following communities will require some level of evacuation. Each has an evacuation map with either 1 or 2 zones, except those in the list with a comment.

- Muriwai
- Manutuke – end of Browns Beach Rd
- Gisborne City
- Wainui
- Okitu – beach only in all scenarios
- Makarori – whole village should go
- Whangara
- Tolaga Bay
- Anaura Bay
- Tokomaru Bay
- Waipiro Bay
- Rangitukia
- Te Araroa
- Hicks Bay

4.6 All Clear Procedures

No/or insignificant inundation

If no inundation occurs, or it is insignificant, and is clear that there is no further threat an all clear message will be broadcast on all radio stations and announced at any evacuation centres.

Before the message is broadcast it must be signed off by the Group Controller and the senior Police Officer. All 'partners' (including MCDEM) should be notified as soon as possible if they are not part of the meeting that makes the decision.

The all-clear message should comprise the following information:

- issuing authority;
- date and time;
- brief description and details of event;
- area(s) now safe to return to;
- instructions to those affected (if applicable):
 - now safe to return;
 - how to return home;
 - road/traffic conditions;
 - security of area;
 - return routes; and
 - assembly areas (if applicable);
- response activities still underway in area;
- statement to follow directions of emergency service personnel;
- recovery services available; and
- direction as to where to seek further information.

Inundation Occurs

If inundation does occur then cordons and restrictions will remain in place until an impact assessment has been completed. Once this has been completed and a plan of action formed it must be communicated to the public as soon as possible.

Those affected must be given the opportunity to attend public/community meetings so that they can be given as much information as possible and assistance where appropriate.

4.7 Radio Stations

Radio stations that people should listen to are:

RNP 98.1FM 585AM

Uawa FM, 88.5FM

Classic Hits 90.9FM, Newstalk ZB 945AM,

MORE FM 98.9, Radio Live 94.8,

Turanga FM 91.7, 95.5, 98.1FM

5.0 PLAN MONITORING, TESTING AND EVALUATION

The Manager – Emergency Management is responsible for maintaining this plan, but it is important that others relay any changes to conditions that may affect the plan.

The plan will be tested as part of the tabletop exercise process which will also allow a review of the Plan.

TSUNAMI RISK

The East Coast has experienced twelve distant Tsunami confirmed events since 1868. For the distant events five originated from South America, another from the Krakatoa eruption, one from the Aleutian Islands and one from Indonesia. The largest rise in sea level recorded from any of the distantly generated events has been between two and four metres above normal high tide. The Pacific Tsunami Warning Centre in Hawaii would provide sufficient warning (eleven hours) for an event that required evacuation. It is important to **note** that potentially damaging distant Tsunami are really only possible from West Coast of South America.

The district has experienced sixteen local confirmed Tsunami since 1832 (four of these were regional from the islands), the two largest had heights of 10 metres and 5-6 metres respectively. These were generated on the Ariel Bank in 1947 approximately 70 kilometres off the coast. A small earthquake preceded both of them with the waves impacting on the coast about 30 minutes later. Scientists have described the type of earthquake involved as a 'long duration' earthquake as they release their energy over a longer period. (The shaking could continue for 90 seconds or more). It is interesting to note that some people on the coast didn't feel the earthquake.

There is the possibility that the size of the wave was increased by a mud volcanic eruption or undersea landslide. There is growing evidence to suggest that these long duration subduction earthquake occur with a frequency of around 1:70 or with an annual probability of 1.4%.

This raises the potential for a wave to be generated with no earthquake at all. Two other smaller events have been recorded in Tolaga Bay in 1926 and 1970 with no earthquake preceding them. These could have been caused either by an undersea landslide or more likely an event associated with meteorological conditions.

The whole Gisborne District coastline is at risk from locally generated Tsunami.

The risk to the City is partly mitigated by the fact that it is very difficult for it to receive a direct hit because of being protected by the Tuahine Headland and the Mahia Peninsula. Waves sometimes wrap around features and increase in size although modelling indicates that Tuahine decrease effects. They can also 'bounce' around bays and become larger.

Information about tsunami is for a short historic (post-1868 AD) period only and it would be simplistic to entirely rely on this data for Tsunami planning.

The available information relating to distant events indicates the only vulnerable assets that would be affected are ships in the port. Those that are manoeuvring could be capsized as the sea empties from the harbour and then surges back in. During the 1960 Chilean Tsunami, eyewitnesses report the harbour draining of water before it surged back up to the top of the wharf. Ships that are tied up could be damaged as they surge up and down.

For distant Tsunami this should not be a problem as sufficient warning is given to allow ships to put to sea and avoid the effects of the wave.

In emergency management planning it is always better to err on the side of caution and look towards the worst case scenario.

The most likely threat for distant events is from the west coast of South America (Peru is seen as more significant than Chile as a source because of the way they propagate across the Pacific).

The distance of the continental shelf from the shore lessens the impact of the Tsunami. The sudden transition from the depths and then the long distance to the shore means that a lot of the energy is absorbed before the wave reaches the coast.

All events have factors that will affect the size and impacts of the waves, they are:

- the amount of water available
- the amount of energy generated
- direct exposure to the wave (areas behind headlands)
- propagation direction
- the re-amplification properties of land shapes (Poverty Bay causes resonance of the wave and increases its size but not its power of penetration)
- The amount of deformation of the seafloor/the incidence of undersea landslides and/or mud volcanic eruptions

Any Tsunami event has the potential to cause a bore (a wave up the rivers) and cause considerable damage. None of the previous 'observed' events have caused the rivers to overtop.

As a worse case scenario, if a wave was big enough to come ashore into the City, either from a distant or local event, then it could damage the port, apartment development on old Heinz Wattie site, railway station, and Waikanae Camping Ground.

If it created a bore large enough to overtop the river banks then there could be damage to the central business district, the District Council buildings, St John Ambulance and the Fire Station.

Considerable work has been done and will continue to be done to convince coastal schools of the need to evacuate inland after a significant or long duration earthquake; there is also a continued need to educate the public.

One of the worst case scenarios for a locally generated Tsunami will be to the camping population along the coast from December through January/February. The potential for a significant number of casualties is real. This is likely when it is remembered that many on the coast never felt the earthquake in 1947. The largest percentage of those injured will have trauma injuries, which will severely test the health system. Outside assistance will be required.

Event Date	Source/Main impact	Source Area	Impact	Trigger
1832 to 1834	Poverty Bay	Local	Immense swell	Earthquake M7
1840	Te Araroa	Local ?	Land strewn with fish	Unknown
13 August 1868	Peru, Poverty Bay	Distant	3-5 metres. Destroyed Maori Village at Muriwai	Earthquake M8.5
11 May 1877	Chile	Distant	2-3 metres	Earthquake M9.0
8 September 1880	Poverty Bay	Local	Land strewn with fish	Earthquake
27 August 1883	Indonesia, Krakatoa	Distant	0.9 metres	Volcano - Atmospheric
2 February 1906	Ecuador	Distant	0.6-0.7 metres	Earthquake M8.5
8 October 1914	Tolaga Bay	Local	Unknown	Landslide Cooks Cove M6.7
11 November 1922	North Chile	Distant	Unknown	Earthquake M8.0
1927	Tolaga Bay	Local	4.5 metres. Smashed wharf piles at Tolaga Wharf	Unknown
2 February 1931	Poverty Bay	Local	1-3 metres at Muriwai	Hawke's Bay Earthquake M7.8
1 April 1946	Aleutian Islands	Distant	Few centimetres	Earthquake M7.4
25 March 1947	Waipiro-Mahanga Beaches	Local	4-11 metres. Run-up about 4m a.MSL at Waima, Tokomaru Bay	Tsunamigenic earthquake M5.9 plus Tsunamigenic earthquake M5.6 plus
17 May 1947	Loisels Beach	Local	6 metres	plus
5 November 1952	Kamchatka	Distant	1 metre (in Port)	Earthquake M8.2
9 March 1957	Aleutian Islands	Distant	Bore up Uawa River	Aleutian Islands M9.1
22 May 1960	Chile	Distant	Run-up about 4.5-5.5m a.MSL in North Tokomaru Bay. Surge about 4 metres in Port	Earthquake M9.5
1970	Tolaga Bay	Local	Bore up Uawa River	Unknown
1972	Anaura Bay	Local ?	0.5-1.5 metres. Calm seas, waves broke across Bay	Unknown
1978	Anaura Bay	Local ?	0.5-1.5 metres. Calm seas, waves broke across Bay	Unknown
23 June 2001	Peru	Distant	Trace	Earthquake M8.1
26 December 2004	Indonesia, Sumatra	Distant	0.4 metres	Earthquake M9.3
5 May 2006	Tonga	Regional	0.17 metres	Earthquake M7.9
3 April 2007	Solomon Islands	Regional	Few centimetres	Earthquake M8.1
20 March 2009	Tonga	Regional	0.1m	Earthquake M7.7
30 September 2009	Samoa	Regional	0.4m – 0.8 m at Te Araroa	Earthquake M8.0
28 February 2010	Peru	Distant	1.2m Poverty Bay	Earthquake M8.8

TSUNAMI ACTION PLAN/CHECKLIST

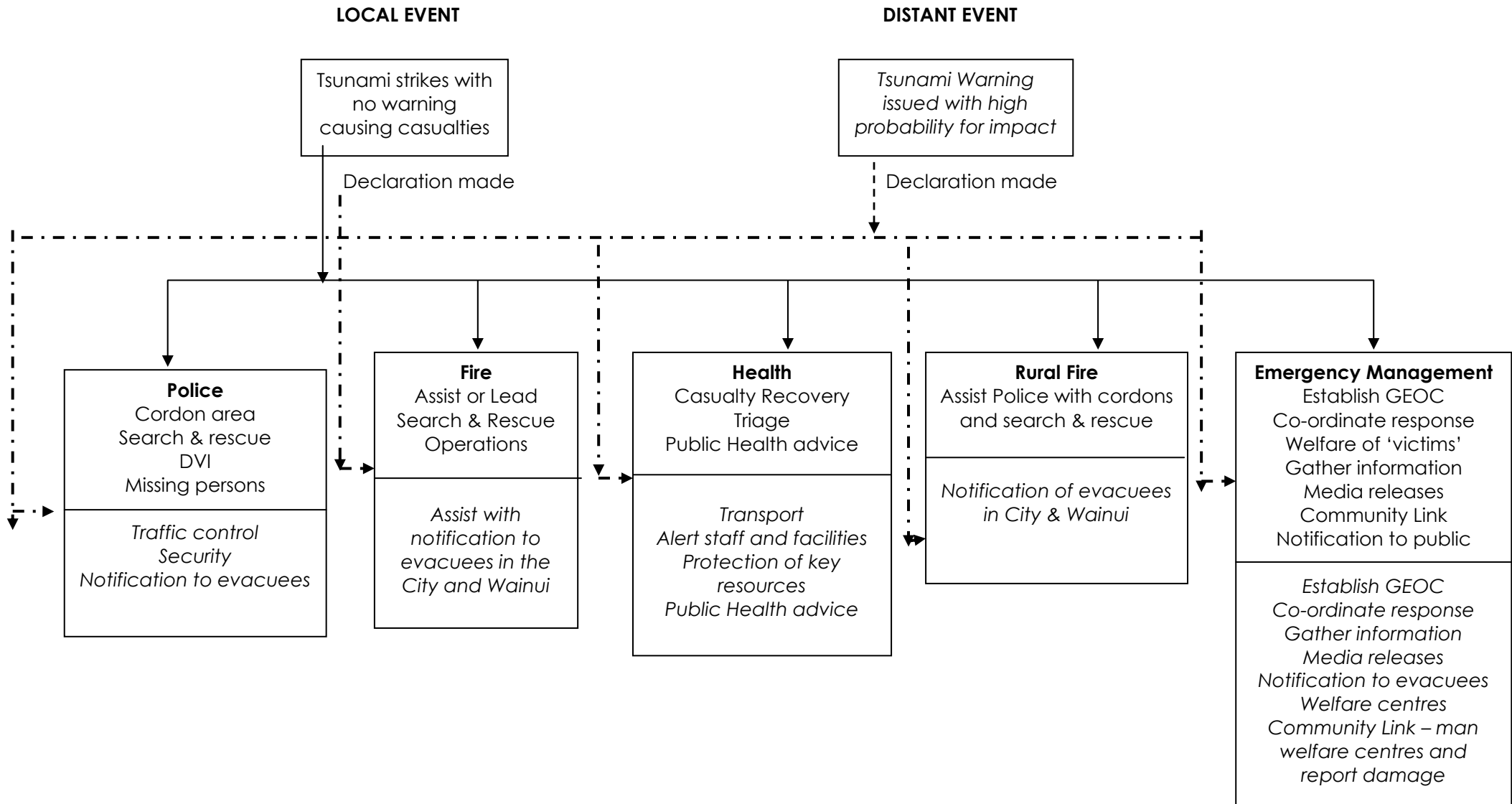
- On receipt of warning arrange meeting in GEOC (within 1 hr of receipt of warning)
 - Meeting agenda
 - Controller Conduct Briefing
 - If wave confirmed consider declaration (may wait for MCDEM's height assessment)
 - If anticipated wave 3m or less consider declaration for crowd control
 - If anticipated wave over 3m consider declaration and extent of evacuation.
 - Review responsibilities
 - Activate appropriate level of TMP
- Establish media links (within 1 hr for distant event or 15-20 minutes after earthquake)
- Establish GEOC (within 2 hrs of receipt for distant event or 20 minutes after earthquake)
- Produce SITREP every 3 hrs
- If impact time is during school hours see list on page 10
- Evacuation of City areas, including Wainui (TBC 3 hr before impact)
- Confirmation from rural coastal communities (TBC 2 hr before impact)

WELFARE CENTRES

The following are the centres that evacuees should initially report to: (these are reporting centres where evacuees can be registered, receive assistance and advice on what will happen next.) Evacuees will be encouraged to 'stay' with family and friends.

COMMUNITY	CENTRE
Muriwai	Muriwai School
Awapuni	Mangapapa Parish Church
Wainui	Te Poho Rawiri Marae
Makarori	Te Poho Rawiri Marae
Whangara	B5 Incorporation Woolshed
Tolaga Bay	Hauiti Marae
Anaura Bay	Anaura Marae
Tokomaru Bay	Tuatini Marae or Te Puia Hospital
Waipiro Bay	Waipiro School
Rangitukia	Rangitukia Rugby Club
Te Araroa	Hinerupe Marae (after event if available)
Hicks Bay	Hinemaurea Marae

EVACUATION SUMMARY OF ACTIONS



TSUNAMI INFORMATION DETAIL FORM

Date and time of call

Caller's name, title and contact information

Expected time of wave arrival

Expected height (if known at the time)

Direction wave coming from, location of earthquake that caused it, time of earthquake in GMT, size of earthquake or other source

Confirmation of Information (can be filled in later)

Note: GMT, Zulu time and UTC are all the same and are normally 12 hours behind NZ or 13 hours for daylight saving.



Handout for those being evacuated during a distant Tsunami event (**Awapuni Township**)

A Tsunami warning has been received generated from an earthquake off the coast

of..... Its expected arrival time in NZ is.....

You are expected to evacuate to the hill side of Childers Rd by.....
and go to either family or friends or to the Mangapapa Union Parish Church on the
corner of Ormond Rd and Atkinson St.

It is likely that you will be out of your home for 12 hours so you should have a look at the
back of the phone book for evacuation hints – BUT DO NOT turn off power, water and
gas.

If there appears to be a problem with traffic then you should proceed along Awapuni
Rd to the Jolly Stockman and come back into town through Makaraka.

To keep a track of the events progress you can listen to any of the following radio
stations.

Classic Hits 90.9FM, Newstalk ZB 945AM,
MORE FM 89.3, Radio Live 94.8,

The ALL CLEAR will be announced over the radio and at the evacuation centres,
please do not try to get back through the road blocks until this is given.



Handout for those being evacuated during a distant Tsunami event (**Wainui**)

A Tsunami warning has been received generated from an earthquake off the coast

of..... Its expected arrival time in NZ is.....

You are expected to evacuate to at least west of Wairere Rd by.....
go to either family or friends (if you choose this option then first go to the Marae to register) or to the Poho Rawiri Marae.

It is possible that you will be out of your home for up to 12 hours so you should have a look at the back of the phone book for evacuation hints – BUT DO NOT turn off power and water.

Okitu is safe from inundation from a distant Tsunami event BUT STAY AWAY from the beach.

To keep a track of the events progress you can listen to any of the following radio stations.

Classic Hits 90.9FM, Newstalk ZB 945AM,
MORE FM 89.3, Radio Live 94.8,

The ALL CLEAR will be announced over the radio and at the evacuation centres, please do not try to get back through the road blocks until this is given.



Tsunami Advisory – Potential Threat to New Zealand

**No: [insert e.g. 02]
Issued at [insert time __: __] hours on [insert date __/__/__]**

A tsunami potential threat advisory is in effect for [insert area at risk]:

The advisory will remain in effect until it is upgraded to a Warning or a Cancellation message is issued.

A tsunami advisory was issued by the Ministry of Civil Defence Emergency Management (MCDEM) at(time) for(areas) coastal regions of New Zealand following a large earthquake at(location). The advisory means that a tsunami is possible but not yet confirmed.

Option A

The location of the earthquake in the Pacific Island region means that there is little or no risk of a tsunami that will cause any problems on our coast line.

Option B

The size, location and magnitude of the earthquake means that there is likely to be inundation on our coast, although at this stage the extent of that inundation is unknown.

Delete this if Option A chosen

If the Tsunami is confirmed, the first waves are expected to reach the districts coast by approximately(time). All residents of coastal areas are urged to stay tuned to their radio stations for further information and to make preliminary arrangements for evacuation if they are located in low-lying areas. Please ensure that your neighbours are aware of this message.

A further bulletin will be issued at, or when the situation changes.

Contact

....., Media Team Leader



Tsunami Warning: Tsunami Confirmed

No: [insert e.g. 02]

Issued at [insert time __: __] hours on [insert date __/__/__]

A Tsunami Warning is in effect for [insert area at risk]:

A tsunami warning was issued by the Ministry of Civil Defence Emergency Management (MCDEM) at(time) for(areas) coastal regions of New Zealand following a large earthquake at(location).

This warning message confirms and updates an early Advisory message issued by MCDEM at(time). Tsunami wave heights of ...m to ...m are expected in(areas).

Option A:

All residents of coastal areas are urged to stay tuned to their radio stations for further information and to make preliminary arrangements for evacuation if they are located in low-lying areas. Please ensure that your neighbours are aware of this message. A further announcement is expected at(time).

Option B:

A civil defence emergency has/has not been declared.

The civil defence organisation will co-ordinate the evacuation of(areas). All affected residents are required to secure their properties and evacuate to safe areas with essential supplies, records and pets. At this stage, the period of evacuation is expected to last until(time) and you should be clear of the impact area by.....(time).

Please stay tuned to your radio station for further information and ensure that your neighbours are aware of this message. A further announcement is expected at(time).

A further bulletin will be issued at, or when the situation changes.

Contact

....., Media Team Leader