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GOOLAWAH COOPERATIVE
VOLUNTARY EVACUATION AND SHELTER ONSITE PLAN

LIVE DOCUMENT

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Project Goolawah Cooperative Voluntary Evacuation and Shelter Onsite Plan	**Project Number** 113003
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GOOLAWAH COOPERATIVE
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1. INTRODUCTION

1.1. Purpose of Plan

The purpose of this Voluntary Evacuation and Shelter Onsite Plan is to demonstrate how the Goolawah Cooperative community will manage flood events for a full range of events up to the Probable Maximum Flood (PMF).

It sets out how flood warnings will be spread amongst the community, makes recommendations for voluntary evacuation, details on what do so if sheltering on site during a flood and how the community should prepare for flooding.

Whilst specialist Flood Management consultants have been involved in the production of this Plan, the Plan will need to be made useful and useable to the landowners at Goolawah Cooperative to be effective. Therefore this Plan has been prepared in such a way that members of the Goolawah Cooperative can adopt and continue to update the plan when necessary.

There are several common misconceptions with regard to flooding and the following should be considered by any flood prone community:

- Because a 10 year ARI event has occurred it does not mean that another flood of the same or greater magnitude will not occur for another 10 years;
- The behaviour of small floods, such as the timing of isolation for the community, can be very different to the behaviour of large floods – the next flood may not occur in the same way as previous floods;
- Emergency evacuation may not always be available – in many flood events a wide area could be affected and therefore the SES and emergency services may be engaged elsewhere during flooding, the number of helicopters is limited and in addition they will not always fly in bad weather likely to accompany flooding;
- Communications may not always be available to call for assistance – bad weather and emergencies can cause infrastructure to be damaged and networks to be overloaded;
- Flood water can be dangerous to wade through even if shallow – there may be uneven ground or other obstacles beneath the water that cannot be seen.

1.2. Frequency of Plan Review

This plan should be reviewed by the board of members of the Goolawah Cooperative. At a minimum reviews should take place:

- On an annual basis, suggested at the AGM or nominated quarterly meeting;
- Following a flood event;
- If there are changes to the site layout and community areas which could affect flood access and onsite shelter; and
- If new Flood Studies (and therefore flood levels and mapping) become available for the area.

Following a flood event the Plan should be reviewed and amended to ensure it remains effective for future flood events. The effectiveness of the plan will be reviewed including assessment of the following:

- Sufficient flood warning;
- Sufficient preparedness;
- Sufficient supplies including food, potable water, medical equipment, fuel; and
- Sufficient services including power, sanitation and communications links.

These issues should be considered in relation to the magnitude of the flood event. Details in Appendix A will be maintained up to date with each review.

1.3. Terminology

The likelihood of flooding is expressed as an Average Recurrence Interval (ARI) or Annual Exceedance Probability (AEP). The ARI is defined as the "long term average number of years between the occurrence of a flood as big as or larger than the selected event" (Floodplain Development Manual, 2005). For example a 100-year ARI flood is a flood of a magnitude likely to occur on average once every 100 years. However it is important to note that a 100-year ARI flood will not necessarily occur only once every 100 years; it may occur for three years in a row and then not again for over 200 years. Therefore it is often better to describe the likelihood of flooding by AEP; "the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage" (Floodplain Development Manual, 2005). For example if a flood has a 1 in 20 chance of occurring in any one year (a 20-year ARI) then there is a 5% chance of it occurring each year and thus is described as a 5% AEP flood.

The Probable Maximum Flood, or PMF, is the largest flood that could conceivable occur at a location, usually estimated from the probable maximum precipitation.

Ground and flood levels are given in metres above Australian Height Datum (mAHD) which is based on mean sea level around Australia. This means that both ground and flood levels can be directly comparable.

1.4. Ownership of Plan

The Plan is under ownership of members of Goolawah Cooperative. A nominee, as noted in Appendix A, will be responsible for ensuring the Plan is kept up to date and that requirements of the Plan are met as well as being the responsible person in event of a flood.

1.5. Nominated Person (Flood Warden)

Two Flood Wardens should be appointed to be responsible for maintenance and action of the Plan. The Primary Flood Warden will be responsible in all instances with Second Flood Warden providing back up, or taking the primary responsibility if necessary. The Primary Flood Warden

should stay on site during flooding if other members of the community remain. If they need to leave the site then a Second Flood Warden should be identified.

The responsibilities of the Flood Warden are listed below. More details on each responsibility are included in the relevant sections of this Plan. Upon nomination as Flood Warden this person should make sure that they have read and understood this plan. The Flood Warden should;

- Be familiar with the Plan and know how to take action upon flood warnings or during flood events;
- Be aware of bad weather situations arising, keep updated on weather forecasts and BOM flood warnings especially flood warnings for the Hastings and Macleay Rivers;
- Ensure all members of the community, on or off site are aware of flood warnings;
- Ensure that community supplies are sufficiently stocked including fuel, food, water and medical supplies;
- Encourage members of the community to stockpile for emergencies;
- Keep register of all residents who have decided to voluntary evacuate and those who have made the decision to shelter onsite including contact details;
- Ensure that during flooding all residents have sufficient power supply, sufficient food, potable water supply and access to safe sanitation; and
- Ensure that the Plan is reviewed on an annual basis, following flooding or any changes to the site layout or other circumstances which may affect to effectiveness of the plan.

1.6. Actioning The Plan

This document describes the Plan in detail. A summary of the Plan, from preparation, flood warning and through to once the flood has subsided, in flow chart form is included in Section 8.

2. SITE DETAILS

The purpose of this section is to identify where dwelling lots, roads and community areas are in relation to each other on the site. Should there be any significant changes on the site such as new dwellings, roads, community areas, drainage or cleared areas then a new site plan will need to be appended to this Plan. A plan of the current site is included in Appendix B.

2.1. Site Layout

The site comprises 78 lots spread over three main living zones; Red Hill, Cockatoo Ridge and Burrendon including The Bowl and Outback. The total area owned by the Cooperative covers approximately 1600 acres (approx. 6.5 km^2) and includes swamp, grasslands and several types of forest. Approximately 200 acres (0.8 km^2) has been cleared for the 78 housing lots and community areas.

Red Hill is located in the east of the site and connected to the rest of the living areas by a low road. The other living zones are located at the west of the site by the Illa Langi Road entrance.

2.1.1. Topography

Information provided by the Goolawah Cooperative suggests the property has height variation between approximately 2mAHD and 10mAHD. All home lots are above 4mAHD as a minimum, rising to over 10mAHD. Observation of aerial topography data shows that significant areas of the property between home lots are generally below 4mAHD.

2.1.2. Access

The main property access is from Illa Langi Road which runs east-west from Maria River Road to the western boundary of the property. Nevertire Road, which connects the property back to Maria River Road from the north western corner, is a designated safety access only and is not encouraged to be used on a regular basis. Both these roads are gravel and in good condition for two wheel-drive vehicles.

Internal roads are of a higher grade, formed of gravel but suitable for 2 wheel-drives and raised and cleared by culverts in sections. Passing bays, turning circles wide enough for Rural Fire Service trucks and high overhead clearance are all maintained feature of the road formation.

2.1.3. Onsite Shelter Locations

Community buildings comprise one primative campground campers kitchen hut and a machinery shed. Two assembly areas are also identified on the site; the western one being near the Burrendong living zone and the eastern one being on Red Hill. Both are over 4mAHD.

3. FLOOD ISSUES

3.1. Sources of Flooding

The Maria River is the main source of riverine flooding in the area. Located approximately 1.3km to the north-west of the closest home site, it flows southwards towards its confluence with the Hastings River about 10km upstream of the ocean entrance. The Maria River is a tidal tributary and largely influenced by flood levels within the Hastings River whereby floodwaters backup the river from the confluence with the Hastings River. The flood water gradient is typically very flat, in the order of 1 meter over 200 kilometres, for the 1% AEP event, due to the storage afforded by the floodplain of the Maria River (Hastings River Flood Study, 2006). Major flooding in the lower Hastings River valley typically occurs as a response to rainfall over a two or three day period.

Connection Creek flows to the Upper Maria River approximately 2km north of the site. This Creek takes flows from Killick Creek, in the Macleay River catchment to the north, and provides a two-way flow path between the Macleay and Hastings catchments depending on which system is in flood.

Flooding in the vicinity of the site is usually caused by either high flood waters in the Hastings River system backing up the Maria River or the Macleay River system through flows from Connection Creek, although flooding from the Hastings system is likely to be more common. The direction of flow can depend on which system is flooding as Connection Creek will take flood water from both systems. When both the Hastings and Macleay River systems are under flood conditions flooding around the site will be at its worst.

3.2. Flood Levels

The flood levels and AEP for a range of design events has not been established specifically for the site. Instead discussion is given on historic flooding and hydraulic modelling undertaken for the Hastings River (Hastings River Flood Study, 2006).

It is of interest to note historic flooding on both the main catchments and what the probability of each of the events occurring was. Although some current site residents are aware of flood events affecting the site in the past, these events have generally been considered to be small. For example, the 2009 event had an AEP of no more than a 10% (10-years ARI) on the Macleay River and caused the site to be isolated for over a week. An event of bigger magnitude will cause higher flood levels and longer periods of isolation.

Although the ARI of floods occurring on the Macleay and Hastings Rivers are not necessarily the same as those at the site, detailing historic floods can give a good indication that floods people may think are rare are not rare in reality. Some significant historic events are shown in Table 1 for reference with approximate ARIs given at Kempsey on the Macleay. For the Hastings the 2006 Flood Study gives ARIs for historic events based at Ellenborough from flood frequency

analysis at the gauge there. However, these are considered to be too far upstream to be relevant to Goolwah so have not been noted in this report. ARIs given are from stage-frequency analysis at Wauchope.

Table 1: Historic Flooding

Event	Catchment	Approx. Probability
February 1929	Hastings	8.3 mAHD @ Wauchope
August 1949	Macleay	90 year ARI
February 1950	Hastings	8.45mAHD @ Wauchope
June 1950	Hastings	8.1mAHD @ Wauchope
June 1950	Macleay	60 year ARI
February 1954	Macleay	5 year ARI
May 1963	Macleay	15 year ARI
April 1963	Hastings	100 year ARI
June 1967	Macleay	6 year ARI
January 1968	Macleay	5 year ARI
1968	Hastings	110 year ARI
January 1974	Macleay	4 year ARI
March 1974	Macleay	4.5 year ARI
February 1976	Macleay	4 year ARI
May 1977	Macleay	4 year ARI
1978	Hastings	10 year ARI
May 1980	Macleay	5 year ARI
April 1989	Macleay	5 year ARI
1995	Hastings	7 year ARI
March 2001	Macleay	13 year ARI
May 2009	Macleay	10 year ARI
June 2011	Macleay	6 year ARI

No recent studies have been undertaken which give flood levels at the site itself. The nearest and most recent study is the Hastings River Flood Study (2006) which identifies predicted peak flood levels for a range of design events for the Maria River. Although the site itself is outside the extents of the study as the study only extends as far as the Port Macquarie Hastings LGA, the nearest flood level is provided at the confluence of the Maria River and Torrens Anabranch about 6.5 km downstream. The 2006 study identifies a relatively flat surface water gradient in the Maria River and, although these flood levels are not site specific, it is not thought that flood levels will increase substantially at the site itself. Therefore the levels detailed in Table 2 below are considered to be appropriate to use as ***indicative flood levels*** at the site.

Table 2: Design Event Flood Levels at the Maria River and Torrens Annabranch Confluence

Design Event	Predicted Flood Level (mAHD)
20-year ARI (5% AEP)	2.9
50-year ARI (2% AEP)	3.3
100-year ARI (1% AEP)	3.7
200-year ARI (0.5% AEP)	4.1
PMF (Probable Maximum Flood)	6.9

It should be noted that the levels above do not include the potential increase in flood levels and / or sea level rise due to climate change and assume a peak tide of 2.2mADH (a 20-year ARI tide). **Therefore Kempsey Shire Council have adopted a 1% AEP flood level of 4.21mAHD and approximately 7.4 mAHD for the PMF, for the area to allow for climate change and sea level rises.** These levels have been marked on the topographic plans of the site and are shown in Appendix B.

3.3. Site Inundation

Observation of aerial ground survey shows ground levels across the site vary from 2mAHD to over 10mAHD in places however all of the 78 plots are located above 4mAHD. Therefore, although parts of the site can become inundated in events as small at the 5% AEP, the dwelling plots will remain dry until the 0.5% AEP event, not allowing for climate change increases. Using Council's adopted levels, as all of the living lots are above 4m they are generally flood free in the 1% AEP event, with some lower portions of the lots becoming inundated. However dry land remains above the 4.21mAHD level on all lots. During the PMF event 56 of the lots become flood affected to varying degrees although ground higher than the PMF level is available on all lots. Furthermore safe access is available to immediately adjacent higher ground from all lots.

Lower lying areas of the site between Red Hill living zone and the other living zones have ground levels as low as roughly 2.5 to 3mAHD and become inundated in even small magnitude events. By the 1% AEP event flood depths between Red Hill and the other living zones could easily exceed 1m cutting access within the site between Red Hill and the other living zones. The isolation of this area of the site from the other areas should be considered in flood planning.

Some current site residents are aware of several flood events affecting the site in the past, the largest of which being the 2009 event. This event had an AEP of 10% (10-years ARI) on the Macleay River and is not considered to be a large flood.

4. FLOOD PLANNING

4.1. Flood Warning

Weather and flood warning information is available from the Bureau of Meteorology (BOM). As well as considering weather conditions, flood warnings for the Hastings and Macleay Rivers should be noted. Other sources of flood warnings should also be monitored such as local radio or council and advice from the SES.

4.1.1. Flood Warning Availability

Severe weather warnings and flood warnings are made available by the BoM. There are several types of warnings which should be understood by the community. These include:

Severe Thunderstorm Warnings
Issued by the BoM when severe thunderstorms are occurring in and area or are expected to develop or move into the area in the next few hours. The warning may also note the hazards associated with the storm including damaging wind gusts, large hail and flash flooding.

Severe Weather Warnings
Severe weather warnings are issued with varying lead times from an hour to about 24 hours depending on the weather situation. They are provided for potentially hazardous or dangerous weather that is not directly related to severe thunderstorms, tropical cyclones or bushfires and, with relevance to the Goolawah Cooperative property, are typically issued for:

- Sustained winds of gale force (63 km/h) or more;
- Wind gusts of 90 km/h or more;
- Very heavy rain that may lead to flash flooding; or
- Abnormally high tides (or storm tides) expected to exceed highest astronomical tide.

Flood Watch
Flood watches cover a river basin or catchment area and are issued when flood producing rain is expected to happen in the near future and flooding is expected to be above a Minor level. General weather forecasts can also refer to flood producing rain. Flood watches for the Hastings/Maria and Macleay catchments are most useful to the site.

Flood Warning
Issued when flooding is expected to occur or is already happening and are issued in relation to a flood gauge on the river. For the Macleay River this gauge is typically Kempsey and for the Hastings the gauges at Maria River and Settlement Point (Port Macquarie) are used, although warnings for other gauges on either catchment should not be ignored. The warning will usually include a predicted flood level at time at which a river will reach that level. In some instances warnings will also include observed peak or predicted river heights. Flood Warnings will note the scale of flooding expected or occurring from Minor, Moderate or Major.

Minor Flooding - Flooding which causes inconvenience such as closing of minor roads and the submergence of low-level bridges. The lower limit of this class of flooding is the initial flood level at which landholders and/or townspeople begin to be affected in a significant manner that requires the issuing of a public flood warning by the Australian Government Bureau of Meteorology.

Moderate Flooding - Flooding which inundates low-lying areas, requiring removal of stock and/or evacuation of some houses. Main traffic routes may be flooded.

Major Flooding - Flooding which causes inundation of extensive rural areas, with properties, villages and towns isolated and/or appreciable urban areas flooded.

The descriptions of minor, moderate and major above are the general definitions given by the BoM. These are not necessarily reflective of what may happen at the site, due to the more unique nature of the site and the need for generalised warning definitions. It may be that a minor flood could isolate the site for several days.

Evacuation Warning – prepare to evacuate
These are issued by the SES when flooding is likely to cut evacuation routes or inundate property to indicate that people should prepare for the instance that an Evacuation Order may be issued.

Evacuation Order
Issued by the SES to advise people of the requirement to evacuate, what to do and where to go. Evacuation orders may be issued through door knock, radio, automated telephone and/or SMS and other forms of media.

All Clear
The SES issue an All Clear when it is safe for properties to return to a flood affected area.

4.1.2. Other signs of Flooding

Floods will not always occur with warning. Residents should also be aware of other signs of flood warning such as natural weather conditions. If bad weather is noticed then the Plan should begin to be acted upon. Likewise if water in the lower areas of the site begins to rise the Plan should also be actioned.

4.1.3. Responsibility upon Flood Warning

The Flood Warden should be responsible for understanding weather and flood warnings and ensuring that all members of the community are sufficiently warned. They should regularly check

for warnings, especially in times of bad weather. However, to avoid reliance on one person, all members should be made aware of flood risk and the purpose of this Plan upon joining the community.

Upon flood warnings, or noticing heavy rains and/or water encroaching on or ponding on the site the Flood Warden should ensure that all members both on and off the site are aware of the situation. This can be done by telephone calls and simply walking around the site to inform all residents. It is equally important to notify members off site so that they do not return to the site through unsafe flood waters.

In the event of flooding residents have two options; evacuation if time and safety allows or to remain on high ground on the site. The choice to evacuate or shelter is down to the individual. However it is strongly advised that those with children, the elderly, and those who need regular medication evacuate, providing that flood waters around the site are not too high to prevent them doing so safely. Before the onset of flooding the community resources should be checked on. Although emergency resources should be sufficient if this plan is adhered to, if there is not sufficient resources for the number of members staying then evacuation should be encouraged.

4.2. Contacts

The contact details of all members should be kept on file available to the Flood Warden. This contact list should also include, where possible, contact details for a nominated family member or friend who live off site and act as emergency contacts as these people may need to be called upon to help with evacuation or accommodate people who have taken voluntary evacuation.

A current list of emergency contacts for the SES, emergency services, etc, should be kept in communal areas of the site and in each review of the Plan should be confirmed that contacts are still current and any more added as necessary.

4.3. Resources

Sufficient resources should be maintained on site for use in case of flooding. The Flood Warden should be responsible for ensuring that appropriate resources are maintained at all times (see Section 6.2).

5. VOLUNTARY EVACUATION

5.1. Who Should Evacuate

Evacuation should be encouraged for all those families with children, the elderly, and anyone who needs medical care. These people are particularly vulnerable to limited supplies of food, water and medical provisions. In some instances the site could be cut for several weeks.

The SES and emergency services should not be relied on to provide emergency evacuation. Usually under flood conditions their resources become stretched and they have to prioritise emergency evacuations and other issues. Additional pressure should not be put onto these services where sensible planning, preparation and actions could reduce pressure on these services and save lives elsewhere.

5.2. When To Evacuate

Evacuation should take place based on the warnings provided by BOM or when it is noticed that flood waters are rising and the site is likely to be cut. It is the decision of the individual as to when they should evacuate if at all. However, if evacuation is left too late then access to the site will become dangerous or cut entirely. If evacuation becomes dangerous people should remain on the site on high ground.

It is difficult to link evacuation with a gauge height on either river systems due to the complexities of the catchments and the distance of the site from the main rivers, rather evacuation is left to best judgement of residents. The larger the flood event the longer the site will be isolated and to greater depths. Residents should take this into account when making their decision on evacuation or shelter onsite.

When considering whether to evacuate or to stay on site, residents should consider the severity of warning from the BOM. Major floods are likely to have higher flood levels and cause the site to be isolated for significant periods of time. Smaller floods, such as that which occurred in 2009 can still cause the site to be isolated for several days.

5.3. Evacuation Procedure

The Flood Warden should take a register of all those who have chosen to evacuate the site including contact details of where they intend to go if known. The Flood Warden should also note if those evacuating are taking any vehicles or other resources that the remaining community will no longer have available.

Evacuation should be via Illa Langi Road if possible and Nevertire Road if necessary. It should be remembered that both roads head toward Maria River Road and therefore flooding could be worse when leaving the site, hence the need for timely evacuation. If evacuation becomes too dangerous people should return to the site.

5.4. Returning to the Site

For residents who have evacuated the site the Flood Warden should be contactable to advise when it is reasonable to return.

6. SHELTER ONSITE

6.1. Community Shelters

Residents who stay on site may choose to stay in their homes, or the homes of others if necessary. If community shelters are to be built, these should be built to be above ground and above the 4.21mAHD level plus a freeboard (0.5m is recommended) so in the event that houses may flood in more extreme events people can still shelter in the community areas.

The identified Western and Eastern Assembly Areas (see site plan in Appendix A) are on ground above 4mAHD and 9mAHD respectably. The campers kitchen building is adjacent to the Western Assembly Area. A proposed shelter shed will be positioned on the Eastern Assembly Area of Red Hill.

6.2. Resources

Certain resources will become vital during flooding and when the community is isolated for several days. Sufficient resources should be stockpiled on site, or a register kept of their whereabouts if items such as generators are owned by individuals rather than the community as a whole. A resources list should be prepared, and appended to this Plan, based on the assumption of full capacity on site (no one opts for voluntary evacuation) and that the site is isolated for up to 10 days. An example of a resources list is included in Appendix C. This should be regularly reviewed and amended in relation to the number of members in the community.

6.2.1. Power

Power on site is important in particular for refrigeration of food to ensure supplies last longer and to reduce risk of health issues from bad food. Power is also important for charging communication devices such as phones and radios to enable weather and flood updates to be obtained or emergency services to be contacted. Lighting is also important in flood situations so people moving around the site can see to avoid hazardous situations.

The campers kitchen currently has an additional solar power battery backed up system installed. Furthermore, each lot on the site is to be powered from standalone solar power systems with battery back-up able to accept a generator boost if required. Nonetheless storm damages can occur to such systems and battery life will be limited. Therefore it is necessary to have generators on site to top up battery life if needed. Sufficient fuel will also be needed. It is recommended that two communal generators be stored on site at all times; one in the Red Hill area and a second in the other areas so that if the areas become isolated from each other both still have access to power. Where members have their own personal generators these should be registered so that in the case of sheltering on site they may be shared with other residents when needed. Any community fuel should be regularly cycled to ensure it is effective when needed and should be stored in compliance with legal requirements.

In the event of low sunlight for more than five days at a time all the solar systems will be able to accept an integrated generator boost if required. The generators will be required to run for several hours at which point the battery packs will be recharged.

Batteries should also be stored on site; a range of types and sizes appropriate to their intended uses. Residents should be encouraged to have their own spare batteries but it is recommended that communal supplies are made available for emergency use. Batteries have expiry dates and should be regularly checked to ensure that supplies are still in date.

6.2.2. Water

Water supplies are vital to the health of an isolated community. People can survive without food for several weeks in some cases, but without water people may only survive a couple of days. Water supplies could become contaminated by floodwater or rain water.

All water on site is harvested rainwater with individuals collecting from their roofs into tanks. It is recommended that 4 litres of potable water per person per day is stockpiled for emergency use. An additional 4 litres per person a day should be stored for cooking, washing and cleaning purposes. This water does not need to be potable but should be treated if used in cooking (boiling or chemical methods). Rather than storing significant volumes of bottled water on site, individual water supplies can be used. The Flood Warden should check, on the issue of a flood warning or if they believe flooding may occur, that the community will have at least a 10 day supply of water assuming no rainfall. If supplies may not be sufficient then additional supplies should be purchased before the onset of flooding.

6.2.3. Sanitation

Poor sanitation can lead to heath concerns and can often occur during flooding when the systems are inundated with flood water. Therefore care should be taken to protect all sanitation systems.

Toilet systems on the site are to be dry composting toilets and located above the 4mAHD level.

6.2.4. Food

Food supplies are vital to any isolated community. Lack of food can cause irrational thinking and health concerns.

Although most residents will have personal supplies of food it is recommended that communal supplies are also maintained including dry goods such as pasta and rice and tinned goods. These should be included on the resources list (Appendix C) and regularly checked for expiry dates.

Food storage should be in areas of the site above 4mAHD to remain dry during a flood event.

Some residents also grow food on site and house chickens. This should take place on home lots above 4mAHD. Although these resources can be used as needed in flood events, they should not be relied on and additional stockpiles will be needed.

6.2.5. Medical

Those with medical issues should have been encouraged to take voluntary evacuation rather than remain on site so as not to put increased pressure on emergency services in case they need to be evacuated from the site at a later date and so that they can have better access to medical supplies. In some instances it will not be known for how long the community will be isolated.

However, if people with health concerns do stay on site, they should be encouraged to always have a stockpile of any medication for at least 1 month. This is the responsibility of the individual rather than the community.

It is recommend that at least two qualified first aiders are present on site at all times during flooding. These people should also be responsible for ensuring that there is a sufficient medical kit on site. Medical supplies should be stored in community areas in both Red Hill and the other site areas in case of total separation of the two areas of the site in larger floods.

6.2.6. Other

Although in small events it may be possible to move between Red Hill and the other areas of the site by 4WD, in events such as the 1% AEP, flood depths could easily exceed 1m and traversing through this water is not recommended. All resources should be split proportionality between stores on the Red Hill living zones and the other zones so that Red Hill does not become cut from resources in the more extreme floods where the access road between the two areas of the site could become impassable.

It is also useful to keep a register of individual owned items that could be shared if needed for example 4WD vehicles which may be required to get round lower areas of the site to move people and supplies. This register can be incorporated into the resources list as one document. It should be also noted though of the possibility of these items being removed from site of that individual chooses to evacuate rather than remain on site.

6.3. Welfare

6.3.1. Community Checks

During flooding residents may choose to stay in their homes. The Flood Warden is responsible for taking at least two checks a day, either personally or by nominating another person, to ensure that all residents are safe and well and have access to ample resources for eating and

sanitation as well as the heath care they need. If residents are suffering, they should be attended to on site where possible. Only in life threatening situations the emergency services should be called. Ideally any person likely to be affected by sheltering on site should have been encouraged to evacuate prior to the onset of flooding.

6.3.2. First Aid

If residents have chosen to shelter on site during flooding there should be at least two trained first-aiders with current certificates on site at all times. The names of these people should be made available to all members of the community.

6.3.3. Emergencies

In the event of any unforeseen emergencies where evacuation is no longer possible or the person is unable to evacuate then the emergency services should be contacted. The telephone numbers of emergency services, the SES, Council and useful contacts should be kept on display in the communal areas so that all residents will have access.

For medical emergencies there should be a trained first aider on the site at all times during flooding. This person should be identified to all residents.

For extreme instances when a person cannot get off site and needs immediate attention the eastern assembly area can be used for helicopter landing. However, it cannot be relied upon that emergency evacuation transport will be available when needed.

6.3.4. Red Hill Living Zone

As Red Hill can become isolated from the rest of the site, this area should have a proportion of the total emergency supplies. In instances where it is noticed that flood waters are rising and it is likely the access will be cut, residents of Red Hill could move temporarily move to the other areas of the site, before flood waters rise too deep to traverse.

6.3.5. Safety

Most flood related deaths occur when people drive, walk, swim or play in floodwaters. Depth and velocities can be easily misjudged. Therefore residents should not drive or walk into floodwater even if it appears to be shallow.

Food or water contaminated with floodwater can be a health issue. Food or drinking water which has been in contact with floodwater should not be consumed.

6.4. Communications

6.4.1. Methods of Communication

During flood events communications can fail due to the flooding directly affecting infrastructure, effects of the storm or simply by overloading of the network. This can cause significant problems especially for those communities who may be cut off by flood waters. Residents on the site have a number of methods of communication including mobile phones, land line phones, fax machine, wireless internet, satellite internet, satellite phone and UHF radio.

There should be at least two UHF radios and/or satellite phones on site at all times and members, in particular the Flood Warden, should know how to use them.

6.4.2. Flood Updates

The residents should not rely purely on internet connection for flooding advice during an event as this may fail due to infrastructure failure or by high usage across the network. Telephone communications should also be used to call for updates. This can be either to friends or family who do have access to the internet and can provide updates or directly to the relevant authorities. It should be noted that information services are likely to be busy during a flooding event.

6.4.3. Contacts

A list of emergency contacts should be made available in community areas. This should include SES, emergency services as well as instructions on how to call emergency services using satellite phones as some satellite phones do not use the 000 or 112 number.

7. AFTER A FLOOD EVENT

7.1. Restocking

Following a flood event the community resources should be counted with reference to this Plan and more purchased if needed or if the Plan review finds that resources were low.

7.2. Review the Plan

After any flood event the Plan should be reviewed to assess how effective it was and where any improvements can be made. The Plan should never be downscaled following a small, for example 5% AEP flood, as it is designed for all flood events up to and including the 1% AEP.

A key consideration of the Plan review is to note any lessons learnt; both in terms of positive and negative issues, and an indication of how severe any consequences were. For example if residents were isolated on the site during flooding and a medical emergency meant a resident had to be airlifted from the site, this could be considered a severe consequence. Consideration needs to be given in the review of the Plan to reduce the risk of this happening again in the future. For example, questions should be considered such as, was the resident ill when the flood warning was issued and therefore should they have evacuated the site rather than stayed, were there enough medical supplies on the site, were medical supplies suitable and accessible and was there anyone on site who could administer aid? On the other hand, it may be that there is a medical emergency on the site but as suitable medical supplies were available and the community was sufficiently prepared significant consequences were avoided.

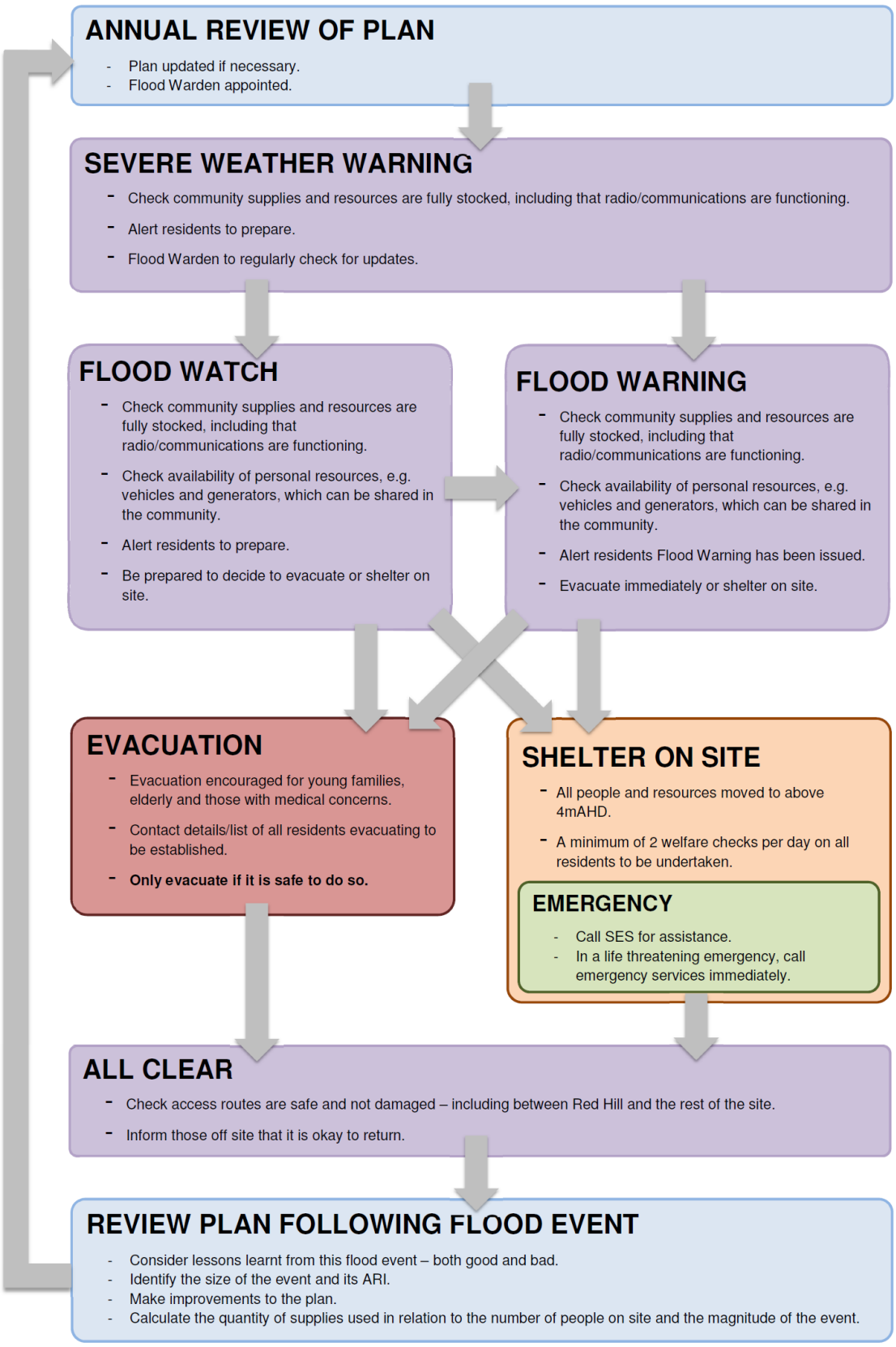
It is also advisable, that when reviewing the Plan the flood level gauge height at Kempsey and/or Port Macquarie is noted and any information on the magnitude of the flood; what ARI or AEP. Where flood watches or warnings were issued it would be useful to note if these were for minor, moderate or major flooding. The purpose of this data collection is to ensure that in the long term the community remains aware of the flood risk and does not begin to get complacent as people leave or join the community.

It is important that the lessons learnt are put into context of the size of the flood. Small floods can mislead on how larger floods may occur in the future. For example, the amount of food supplies needed in an event where the property is isolated for 2 days will be significantly less that in a larger magnitude event. So where the lessons learnt may suggest that there was surplus supply to requirements during a flood this may have only been a relatively short duration event and therefore the lessons learnt are better documented by how much supplies were used, by how many people and for what time period of inundation.

The Flood Warden will speak with residents to find out where the Plan was successful or failed to be effective, including consideration of the amount of resources on site, the number of people sheltering on the site and for how long the site was cut off. The review in Appendix A should be completed.

8. ACTIONING THE PLAN

The flow chart below shows the process for actioning and maintaining the Plan.



REFERENCES

DIPNR (now OEH), **Floodplain Development Manual,** NSW Government, April 2005

Patterson Britton & Partners, **Hastings River Flood Study**, Issue 3, Port Macquarie-Hastings Council, 2006.

Appendix A

GOOLAWAH COOPERATIVE
VOLUNTARY EVACUATION AND SHELTER ONSITE PLAN
PLAN REVIEW AND UPDATE

Date of plan:	February 2013
Version:	1
Date of next review:	February 2014 or on Determination of DA (whichever is sooner)
Flood Warden:	Kristy Steer
Second Flood Warden:	David Launt

Comments / Amendments to Plan:

First Plan prepared by WMAwater, floodplain engineering consultants, to provide additional details required by Kempsey Shire Council (KSC) for determination of Development Application T6-02-109. Plan prepared after detailed discussions with KSC and Kirsty Steer of Goolawah Cooperative. Flood information based on the Hastings River Flood Study (Patterson Britton & Partners, August 2006), WMAwater's knowledge of the area and discussions with KSC. Site plans in Appendix B were supplied by Goolawah Cooperative (January 2013). Once this Voluntary Evacuation and Onsite Shelter Plan has been made available to Goolawah Cooperative it becomes their responsibility to maintain and action as necessary. WMAwater will take no responsibility for any amendments of the plan following February 2013 or for persons not adhering to the Plan.

Actions for Goolwah Cooperative, if not already in place, to be appended to this Plan after the DA and members are official residents:

- Identify the person, Flood Warden, responsible for the plan.
- Prepare register of all community members including contact details, and emergency contact details.
- List all current community resources on site and if necessary purchase additional supplies;
- List all members resources on site including generators, vehicles (4x4s), etc

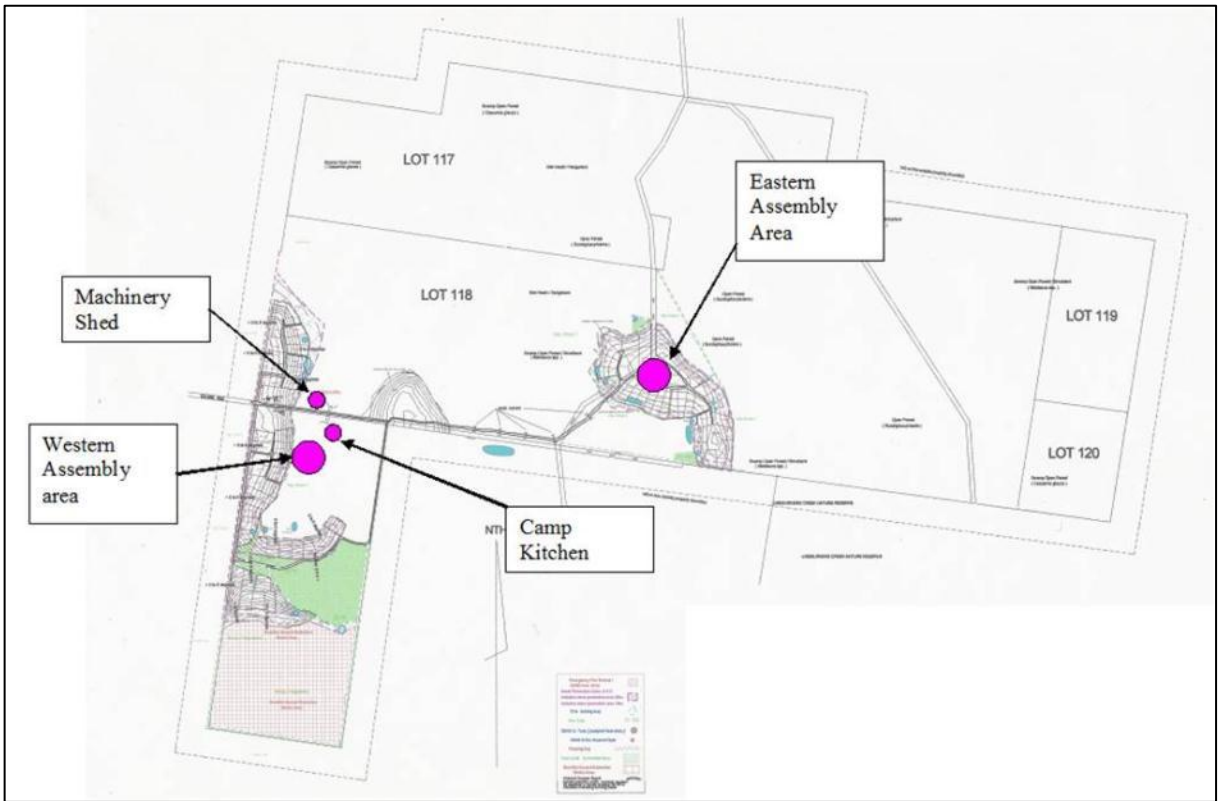
Laura Wallis, WMAwater, February 2013

GOOLAWAH COOPERATIVE
VOLUNTARY EVACUATION AND SHELTER ONSITE PLAN
PLAN REVIEW AND UPDATE

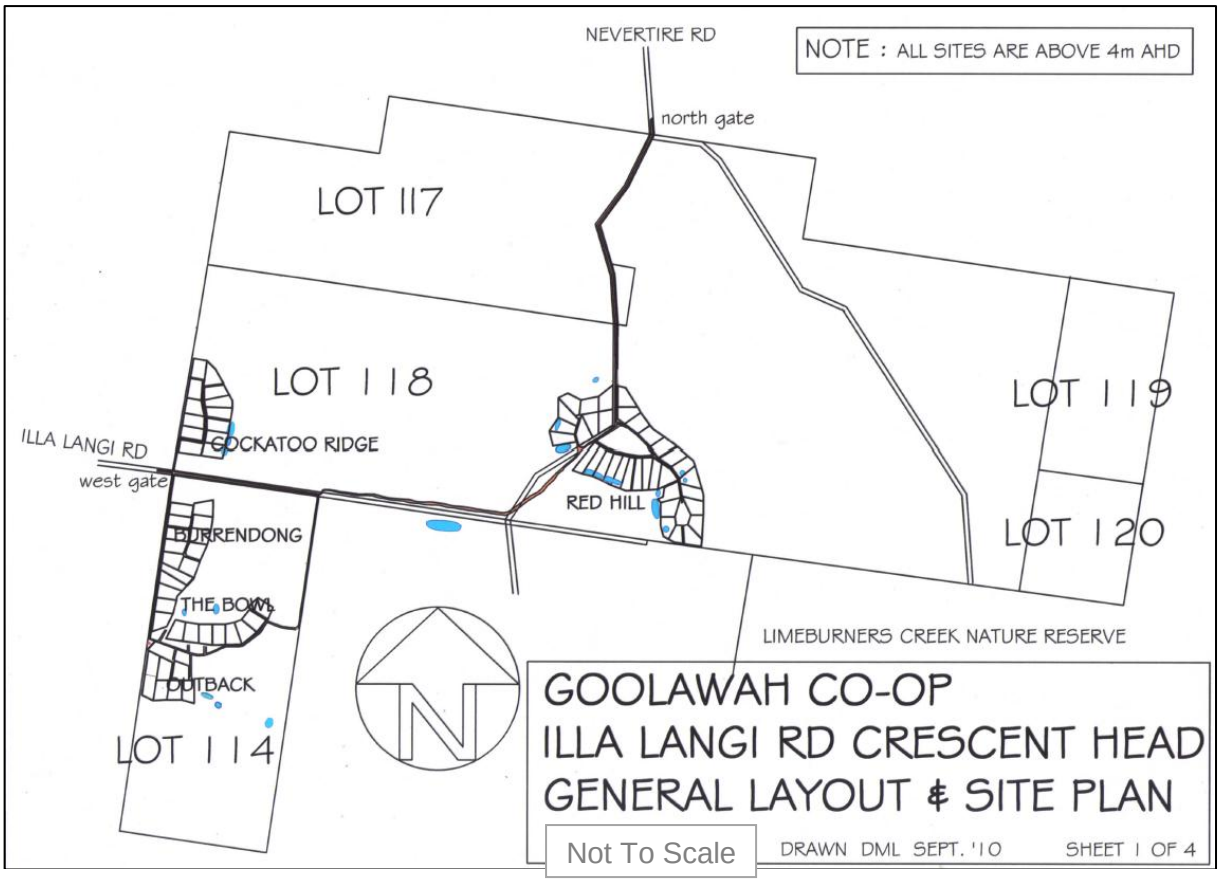
Date of plan:	
Version:	
Date of next review:	
Flood Warden:	
Second Flood Warden:	
Following a flood event:	
Peak flood level:	
Minor / moderate / major:	
Location:	
Date/Time:	
Flood warning details given:	
Lessons Learnt:	
For all reviews:	
Comments / Amendments to Plan:	

Appendix B

Community Areas



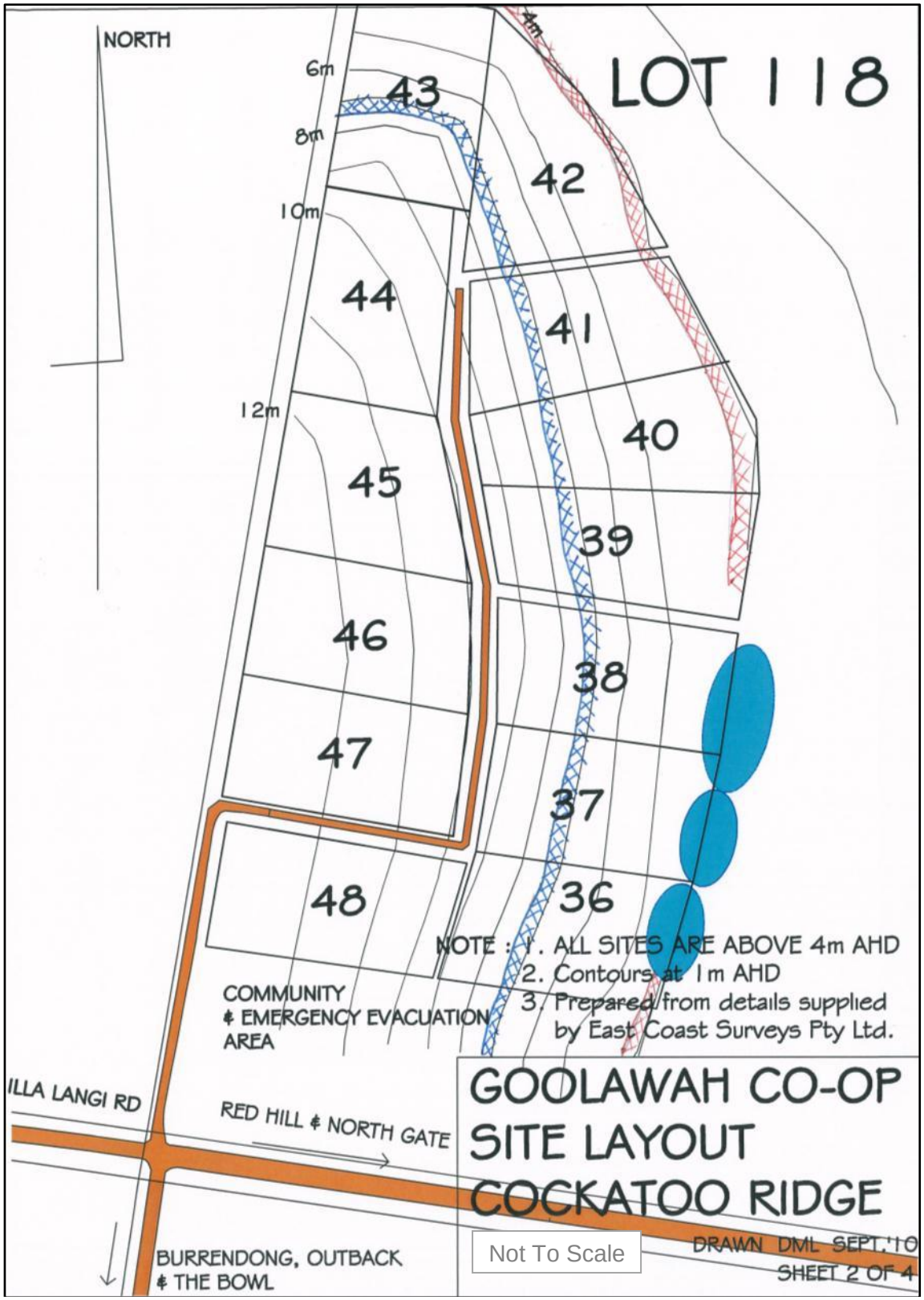
Living Zones



Indicative Flood Outlines

100-year = 4.21mAHD

PMF = 7.4mAHD



Indicative Flood Outlines

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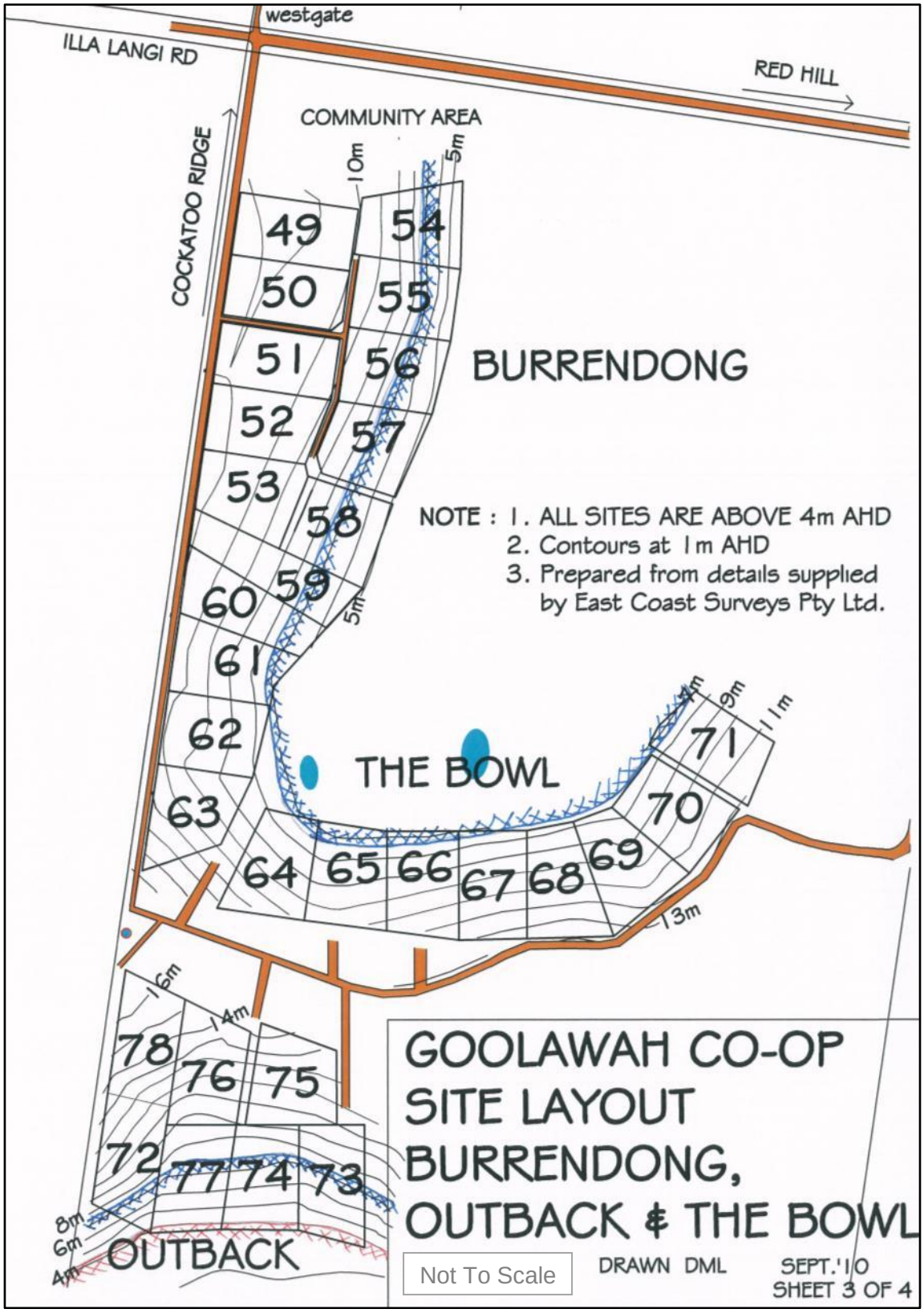
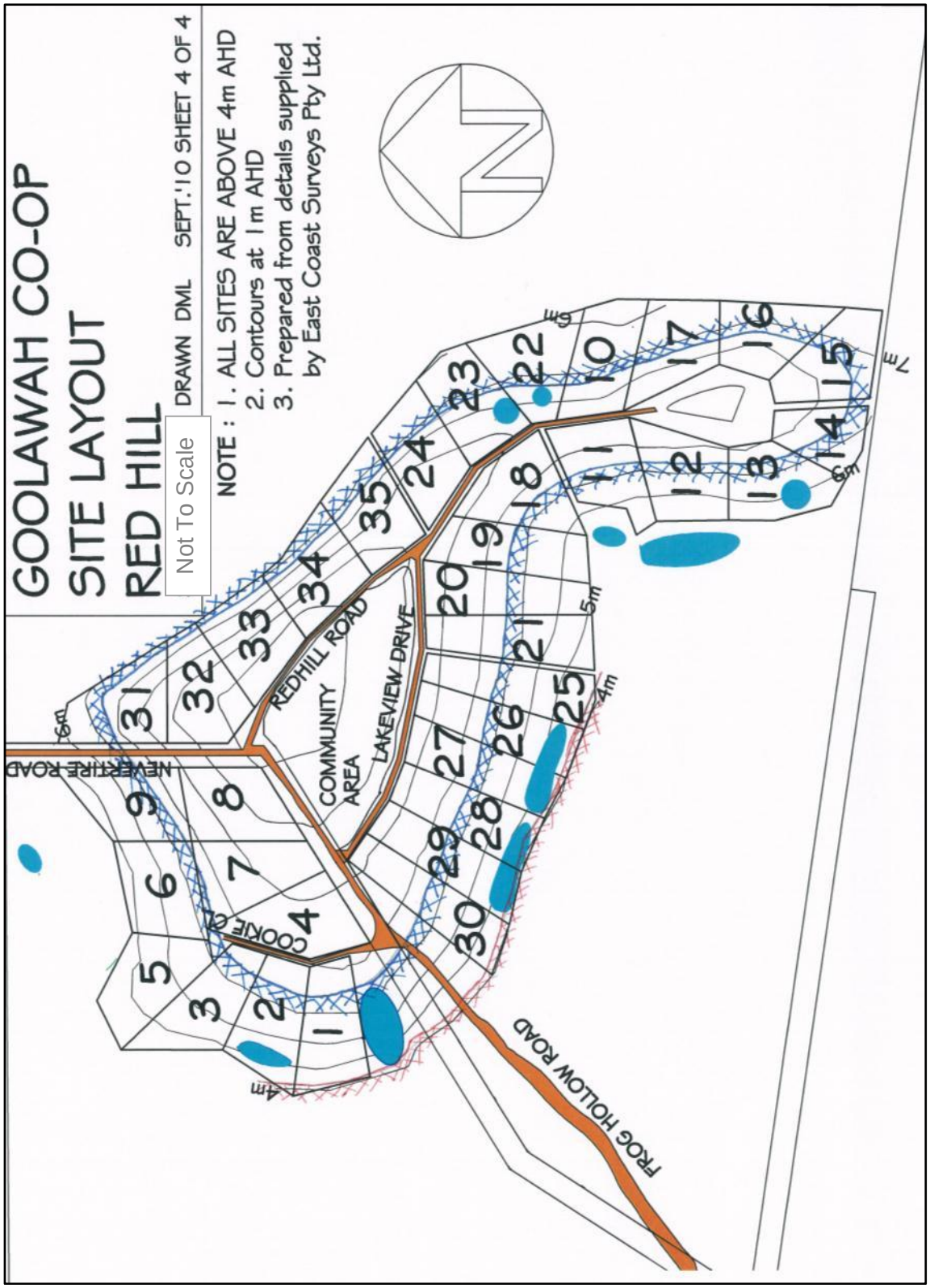
PMF = 7.4mAHD



Indicative Flood Outlines

100-year = 4.21mAHD

PMF = 7.4mAHD




Appendix C

EMERGENCY RESOURCES LIST

It is recommended that the following is maintained on site at all times to provide sufficient resources during a flood event assuming the site is at maximum occupancy (78 lots) and isolated for 10 days. A list of site resources based on the current number of occupants should be maintained and reviewed each time the Plan is reviewed. In preparing the list it should be noted that the Red Hill living zone can be isolated from the rest of the site.

Recommended Community Resources Required for Full Site Capacity for 10 Days Isolation

Resource	Minimum Amount Required	Notes Community / Individual owned
POWER / WATER / SANITATION		
Generators	2	A minimum of one required in Red Hill and one for other parts of the site.
Fuel	Sufficient to run 2 generators for the time required to top up solar power battery backup systems	Should be stored in accordance with legal requirements and consideration for fire safety, fuel also needs cycling to ensure it is always good for use.
Batteries	Spares for any communal equipment	Should be checked for expiry dates when Plan is reviewed
Bulking Agent (if required)	Sufficient to maintain community toilets	Extra can be stockpiled by the individual.
Water	4 litres per person per day for drinking 4 litres per person per day for other use	Can use usual individual rainwater supplies. Additional bottles supplies may be purchased before onset of flooding.
FOOD		
Dry goods	200g per person per day	Pasta, rice
Tinned goods	1 tin per person per day	Tinned fruit, beans, etc
MEDICAL		
Advanced first aid kit	2	A minimum of one required in Red Hill and one for other parts of the site.
Individual Medications	Responsibility of individuals	Individuals should be encouraged to stockpile medications
OTHER		
UHF radio and/or satellite phones	2	A minimum of one required in Red Hill and one for other parts of the site.
4 WD vehicles	n/a	Individuals – records should be kept of how many on site if they need to be borrowed by other residents and noted if removed from site by residents taking voluntary evacuation.

EMERGENCY RESOURCES LIST – 10 DAYS

Date of list:	
Version:	1
Date of next review:	
Current Number of Residents (assume all on site):	
It is to be assumed that all residents will opt for shelter on site over voluntary evacuation and the site is isolated for up to 10 days.	

Resource	Minimum Amount Required	Notes Community / Individual owned	Cycling check due
EXAMPLE ONLY: Generators	*2*	*Individuals. Mr A Blogs Lot 10 and Mrs B Person Lot 58.*	
EXAMPLE ONLY: Satellite Phone	*1*	*Community. Stored in camp kitchen at Cockatoo Ridge. Instructions for use stored in same location.*	