Disaster management planning and preparedness

Planning

planning process

'The collective and collaborative efforts by which agreements are reached and documented between people and organisations to meet their communities' emergency management needs; a sequence of steps that allow emergency management to take place.' [1]

Effective planning

Hazard identification and risk assessment are fundamental to effective disaster management and are the basis for planning and programs.[2] Identification of hazards and assessment of risks should occur regularly and build upon lessons learned, experience, training and exercises.[3] Planning must be based on the best available information and up-to-date data, including risk assessments.[4] Effective risk assessments will identify specific roles for all phases of disaster management, and consider all types of events,[5] including those hazards caused by human intervention and naturally occurring events.[6]

Disaster management planning is effective when all entities work conjointly.[7] Many different types of entities, including councils, emergency services, community groups, critical infrastructure owners, and the community need to be involved in deciding how to manage risks, and how responsibility will be shared when responding to disaster events.[8] This requires agreement about how the entities can eliminate, avoid or substitute risks, or transfer residual risk.[9] Collaborative planning supports effective response where duplication of effort or gaps in service to the community are minimised.[10]

A thorough risk-based planning approach will consider unintended consequences, inform and prioritise risk reduction activities and hazard mitigation strategies.[11] For example, land use planning is a fundamental flood mitigation strategy that must be based on risk assessments, and in particular, flood risk studies, to be effective.[12] The diagram below shows how land can be zoned based on flood risk to reduce the impact of flood on communities.[13]

Left: Land use zoning based on flood risk can reduce the community impact of flood.

Illustration courtesy of WMAWater

All entities, including the community, must be clear on their responsibilities to minimise risks, or to reduce the impact of disaster events.[14] To do this, everyone must understand the risks and options for risk reduction.[15] Communities and other stakeholders rely on risk assessments and hazard identification products to be readily accessible.[16] Plain language explanations of the risks and clear expectations of different responsibilities are necessary.[17]

The strategies used to deal with risks will inform the disaster operations of the entity, including provision of public information and warnings.[18] In order to achieve risk-informed disaster operations, effective planning must:

- communicate disaster management priorities (e.g. identify vulnerable people and mechanisms for their protection)[19]
- ensure agencies work together to develop the plan; planning must be a process and not just a product[20]
- provide linkages between the plan and the entity's core business, with clear identification as to who will complete a certain function (e.g. evacuation)[21]
- clearly articulate an entity's capability and escalation points (e.g. the plan identifies when further assistance may be required)[22]
- encompass exercises and training[23]
- identify what needs to be done and allocate responsibility to people or groups.[24]

Banana Shire Council

Local Disaster Management Plan

We found that the Banana Shire Council's (the Council) Local Disaster Management Plan (LDMP) could be improved through an integrated risk-based planning process. Increased stakeholder engagement in the planning process would reduce the likelihood of omissions and identify circumstances where the disaster response capacity of the Local Disaster Management Group (LDMG) would be exceeded.[25] Importantly, this process would allow for the identification of circumstances where a request for assistance would be generated.

While the LDMP outlines the roles and responsibilities of the agencies that are 'core members' of the LDMG, there is a need to expand the roles of 'advisory members'.[26] This includes SunWater, which has a support agency role for specific hazards in *Part II - Local Disaster Management Group* of the LDMP, but no clear responsibilities even though a number of its dams are identified as hazards in another part of the LDMP.[27] Advisory members are not involved in planning, nor do they agree to what role or responsibilities they offer.[28] Without agreement during the planning process, there is a risk that mismatched expectations will result in gaps or duplication of service to the community.

Hazard identification and risk assessment

Part III – Disaster Risk Assessment of the LDMP addresses hazard identification, risk assessment and risk treatment.[29] In 2012, the Council commissioned a *Natural Hazard Risk Assessment* report from private sector risk analysts.[30] This forms the basis of *Part III* of the LDMP.[31]

Part III – Disaster Risk Assessment of the LDMP identifies a total of 20 known hazards to the Banana Shire, including major hazards of cyclone, dam failure, East Coast Low pressure systems and flood.[32] These hazards are discussed generally, which does not contribute to a comprehensive understanding of risk. For instance, cyclones are noted to be a high risk that *'can cause flooding in any of the rivers'*.[33]

The LDMP identifies flood risk as medium to high, noting that sustained rainfall events can cause moderate to major flooding in different parts of the Banana Shire.[34] The 'flood' section of the LDMP is restricted to the Dawson and Fitzroy river systems and does not reference the numerous creek systems that also pose a flood risk to residents.[35] The LDMP also identifies risks of flooding from the Callide and Kroombit dams.[36] The generalised nature of the LDMP's descriptions of hazards may not sufficiently articulate the risks to the community.

The LDMP is readily available on the Council website.[37] The publicly available version of *Part III - Disaster Risk Assessment* does not include:

- *Annexure A – Risk Register*,[38] which details projected impacts of natural disasters to the people, environment, economy, infrastructure, the community as a whole and the governance of the Banana Shire; or
- *Annexure B – Risk Treatment Plan*,[39] which outlines treatment strategies for identified risks.

Releasing these annexures publicly could promote greater community understanding of local risks. This is because these annexures provide more detailed information about discrete areas of risk throughout the Banana Shire.

Part IV – Capacity Building of the LDMP outlines that the Council, in conjunction with the LDMG and other agencies, will provide detailed explanations of particular hazards to the community.[40] *Part IV* also indicates that the community will be provided with information about practical measures residents can take to prepare for, or mitigate effects of, a disaster.[41] We did not find evidence of either of these capacity building strategies occurring and think there is opportunity to better inform and prepare the community if these strategies are strengthened.

Flood modelling and mapping

Effective flood models and maps are an important tool to enable councils to identify, understand and mitigate risks associated with flooding.[42] The Council's efforts in respect of flood modelling and mapping have been limited.

The *Callide Valley Flood Risk Study* was completed in 2010.[43] The study includes general flood maps, but possible impacts from flooding to properties are not included. The objectives of this study were to:

- Assess flood inundation due to riverine flooding of the major creeks within the Callide Valley
- Determine flood hazards and vulnerabilities relating to infrastructure and communities
- Identify risk mitigation approaches.[44]

Improving the *Catchment Management Plan* is one of the risk treatment strategies identified in the Council's *Risk Treatment Plan*.[45] The purpose of the strategy was *'to identify and prioritise actions to reduce potential adverse impacts of flooding'*.[46] This project was identified as being beyond the Council's capacity and budget, so further study was not undertaken.[47]

The Council also attempted to undertake a flood study for the Dawson River.[48] The Council obtained state government funding for the project in 2010/2011.[49] In November 2013, the Council sought an extension of time from 31 January 2014 to 31 December 2014 to complete the project.[50] At this point, the Council had not actually put out a tender for the project.[51] An extension was granted, but only until 30 June 2014.[52] Consequently, the Council only partially completed the project.[53]

The Council has cited *'budget restraints'* as an underlying factor that affects its prioritisation of mitigation and planning activities.[54] While this is, of course, a fundamental concern for the Council, it does not explain why projects partially funded from sources external to the Council, such as state government, were not completed.

The Council has told us that a new flood study was approved in February 2015 after protracted negotiations.[55] A fit-for-purpose flood study will enable the Council to more effectively identify and prioritise actions to reduce potential adverse impacts of flooding.[56] This includes an opportunity for the Council to produce more information for the community about the risks of floods.

We suggest that the excellent materials about flood risks produced by other councils be examined and leveraged by the Banana Shire. For instance, the Southern Downs Regional Council has three *Emergency Action Guides* available for Warwick,[57] Stanthorpe[58] and Killarney.[59] These are available online and provide good information about flooding, flood history for the area, how to prepare and respond, the Bureau of Meteorology (BoM) warnings, and explanation of the flood severity classifications for the area.[60] They also include flood evacuation maps showing the flood extent linked to different river gauge heights.[61] Further, they identify which properties will have yard flooding or flooding above floor level, depending on the river gauge height.[62] These publications are a good example of how detailed flood studies can be transformed into accessible, cost-effective and easily understood public information.

Another example comes from the Bundaberg Regional Council, which has developed a sophisticated interactive mapping system that is linked to river gauge heights for the Burnett River.[63] The Bundaberg Regional Council also offers static maps[64] with versions available to the public that are easy to use and interpret. Users of the interactive site can select different stream gauges along the river, choose a gauge height and see the likely flood extent in relation to their property.[65]

Town planning

As a primarily rural local government area, the Council has basic controls for town planning. The *Natural Hazard Risk Assessment* report prepared for the Council in 2012 outlines existing preventative and preparedness controls for flood risks.[66] Controls include: land use and building restrictions, such as zoning, removal of existing buildings, establishing minimum floor levels, and raising buildings.[67] Lessons identified from previous events, along with information available in the *Natural Hazard Risk Assessment* report appear to have informed town planning for Taroom and Theodore, where minimum floor heights are set for new developments.[68] Elsewhere, rural zoning allows for self-assessment and private certification, which may limit the contact a property owner has with the Council.[69]

Under the existing planning scheme, the Queensland Reconstruction Authority maps are the main source of information on past flood areas (in the form of a map overlay).[70] The Council adopted the use of these maps in December 2011.[71] We have been told though, that these maps are not available in high enough resolution to enable the identification of flood levels expected for particular properties.[72] All flood maps to inform town planning are available to the public via the Queensland Reconstruction Authority website. The Council provides a free planning enquiry and pre-lodgement service to property owners that would connect people with available flood maps, should they seek this assistance.[73]

The Council is presently pursuing amendments to its planning scheme, to align with the *Sustainable Planning Act 2009* (Qld). This is done through the Department of Infrastructure, Local Government and Planning (DILGP). The Council's proposed plan has been in draft form for nearly two years, although this is not unusual for local government planning schemes.[74] While it is for the DILGP to assess the appropriateness of the Council's proposed revisions, we note that the Council's proposal appears to include some improvements on its existing land use planning arrangements, including:

- Flooding is more prominently highlighted
- Floor heights are based on either being (a) above 1% Annual Exceedance Probability (AEP) flood height (i.e. a 1 in 100 year flood), or (b) the highest part of the site (if the 1% AEP flood height is unknown).[75]

The absence of flood modelling will still impact the proposed plan, as there will continue to be a reliance on local knowledge about previous flood heights rather than the ability to use more accurate data to inform planning decisions.

Other strategies

A register of people at high-risk of impact from a disaster was suggested as a risk treatment strategy, but the Council did not pursue this due to concerns about privacy laws.[76] We found no evidence to suggest that this decision was based on legal advice. The Council's view is that the State should pursue such legal advice on a state-wide basis.[77] Engagement with the Privacy Commissioner could have provided information regarding flexibility to use personal information in an emergency to prevent serious threats to life, safety and welfare of persons.[78] Seeking consent from individuals to collect and use their information in the event of an emergency may also be explored and is a method used by the Cairns Regional Council.[79]

Impact of Council's planning on its ability to respond

The LDMG and the Local Disaster Coordination Centre (LDCC) are housed in the Council Chambers. This building is in a flood prone area and the main access route has been cut during previous flood events.[80] The photo below shows the Council Chambers during the 2015 event:

Right: Aerial view of the Banana Shire Council Chambers complex during the 2015 flood.
Banana Shire Council

The Council has also experienced problems with communications to and from this building in past events.[81] In this instance, the Council's satellite phones were unavailable and we were advised that the CB radio network identified in the *Risk Treatment Plan*[82] could have been much better utilised to overcome communication problems.[83] Telstra and the Local Government Association of Queensland told the Council about telecommunications options that would have reduced communications issues to a degree, but the Council declined the free service (DISPLAN) on the basis it was perceived to be of no value (see also Telecommunications Infrastructure).[84]

Business continuity planning is identified as a risk treatment strategy for some of the risks outlined in the Council's *Risk Treatment Plan*, including East Coast Low pressure systems and severe thunderstorms and electrical storms.[85] For these risks, the *Risk Treatment Plan* recommends that further study be undertaken on cost and funding implications.[86] To date, no further study has been completed.[87] However, for flood and cyclone risks, business continuity planning is not listed as a risk treatment strategy. The Council does not appear to have prioritised the completion of its business continuity planning. Completion of the plan would focus attention on a range of issues and potentially enhance or prioritise other work needed to strengthen local disaster management arrangements.

There is a council depot that is spoken about as a redundancy site for use in the event that the Council Chambers is not accessible.[88] There is some uncertainty amongst Council staff, LDMG members and District Disaster Management Group (DDMG) members as to whether this site can actually be used, as it is not in the LDMP and has not been tested.[89] Had a business continuity plan been prepared and the site tested, an informed decision could have been made whether to move to the backup location. This may also have avoided the communications issues experienced within the LDCC on Saturday 21 February.

2013 Review of Callide Dam Gate Operations in the January 2013 Flood Event

The Terms of Reference require consideration of the recommendations arising from a review of the Callide Dam in the January 2013 flood event. The independent hydrologist report commissioned for this review (Appendix G) deals with the recommendations made to SunWater in the 2013 report. While the 2013 review focused on SunWater's gate operations, there were a number of minor recommendations relating to the Council.[90] These recommendations included:[91]

- *'... investigation to identify damaging flow levels in Callide Creek, perhaps including some flood mapping to assist in identifying impacted properties and escape routes'*
- *'... given the long history without flooding in Callide Creek, Council may wish to consider some community education on flood behaviour in Callide Creek, which would assist in improving the resilience of the local community to flooding'*
- *'The LDMG may wish to improve the information and resources available to it, such as damage-stage tables or pre-modelled event surfaces, to enable the consequences of Callide Dam gate releases to be assessed in conjunction with downstream flows'*
- *'There may be some improvements that either SunWater, the LDMG, or other parties may be able to take to improve advice to residents'*
- *'... with some improved modelling and/or instrumentation, better estimates of future conditions may be made, providing longer lead times for advice to residents.'*

The Council disputes having received a copy of the report.[92] We did not find evidence of the report being discussed at LDMG meetings. Had these recommendations been made available to, and effectively implemented by, the Council or the LDMG, each improvement had the potential to reduce the impact to the community from the flood event in February 2015.

Gladstone District Disaster Management Group

District Disaster Management Plan

The Banana Shire is assisted by the Gladstone DDMG.[93] The DDMG has a legislative responsibility to review and assess the disaster management of the relevant LDMGs in its district.[94] This involves the consideration of *'the capabilities and capacities of each of the LDMG's and includes the likely actions the district group may need to take to support those respective areas'*.[95] The performance of the LDMG should also be assessed in real events and exercises.

The Gladstone DDMG prepares a District Disaster Management Plan (DDMP).[96] The Gladstone DDMP identifies a number of hazards that can impact upon the district through direct, indirect or intangible means. The top three identified direct threats to the district are:

1. Inadequate disaster management
2. Flood
3. Cyclone.[97]

The Gladstone DDMP rates both cyclone and flood as extreme risks, while the risk level for inadequate disaster management by local government is rated as high.[98] The DDMP identifies that inadequate disaster management can lead to inefficient and inadequate responses to disasters.[99]

The Gladstone DDMP states that, for flood hazard, the BoM issues relevant warnings to affected residents who may be at risk of localised flooding.[100] This does not recognise the responsibilities of local government to warn residents.

Risk Register and Risk Treatment Plan

There are two annexed documents to the DDMP: *Annexure C: Gladstone District Risk Register*[101] and *Annexure D: Gladstone District Risk Treatment Plan.*[102] Both of these documents provide detail that is not available in the DDMP and both are restricted documents. As with the Council LDMP, the restriction of these detailed documents may limit community understanding of risks and how to prepare for them.

The *District Risk Register* comprehensively outlines identified risks in 22 categories, each with several sub-categories examining the area of impact (i.e. human, social, transport, etc.) and outlining controls.[103] The DDMP identifies relevant stakeholders and other government departments that would need to be engaged in each risk category.[104]

Control mechanisms for the risk of inadequate disaster management in the *District Risk Register* include: reviewing local and district disaster management plans; regular LDMG and DDMG meetings; engaging with the LDMG regarding selection, induction and training of LDMG members and outlining their roles; testing communications systems and more.[105] As a business continuity plan is a key control mechanism identified in the DDMP, the DDMG should have identified that when the business continuity plan was spoken about by the Council, this was not a reference to a documented or robust plan.[106]

In the *District Risk Register*, flood risk is divided into several sub-categories, with each category exploring slightly different risks and impacts. One of the identified flood categories relates to an extreme rainfall event resulting in flooding and having a major impact upon residents.[107] Relevant controls include:

- The LDMG to develop flood mapping
- Develop community awareness
- Building regulations
- Audit business continuity plans
- Evacuation arrangements, including local sub-plans, identifying at-risk groups and persons, identifying evacuation centres and shelters, considering evacuation timelines, trigger points and routes
- Emergency Alert
- Test and review plans
- Identification of other agencies and organisations to assist in response and recovery.[108]

Tropical cyclones are also examined in several sub-categories, with suggested control mechanisms similar to those for flood risk.[109]

The *District Risk Treatment Plan* outlines the risk treatment plan for each sub-category.[110]

District Plan in operation

The DDMP supports operations of the DDMG during an event, including DDMG support to the LDMG when their capabilities and limitations are reached.[111] In order to anticipate and prepare for the support that may be requested from LDMGs, the DDMG must have a good understanding of the LDMG's capabilities and limitations.[112]

As the DDMG is there to support and oversee the LDMG, it is not directly responsible for the functioning of the LDMG and the local council's response to an event.[113] From our interviews with DDMG members, LDMG members and Council staff, and observations from reviewing LDMG minutes, we note the DDMG attempts to fulfil its role primarily through support and guidance in the preparation and response phase, prompting the prioritisation of disaster management by the Council.

Members of the DDMG highlighted that action items are regularly not followed through by the Council or the LDMG and cited the funding provided for the flood mapping study as an example.[114] Other examples we have identified include:

- The *Natural Hazard Risk Assessment* report, which was finalised in November 2012, but was not referred to the Council for adoption until November 2013.[115]
- The LDMG *Improvement Action Plan*, which was developed following the January 2013 flood event and identified 29 action items.[116] At the 4 November 2013 LDMG meeting, the DDMG representative stated that *'the District Disaster Coordinator ... has expressed some concerns in relation to the number of items that remain outstanding and not actioned, especially considering that the action plan was developed in about February 2013 as a result of relevant LDMG debriefs and there has been substantial time to implement any corrective issues'*.[117] The *Improvement Action Plan* was not finalised until 5 May 2014.[118]
- A review of LDMG meeting minutes from 2010 to 2015[119] showed that timelines were rarely set for action items, and record-keeping processes did not clearly or consistently highlight if action items had been completed.

SunWater

Emergency Action Plan requirements

SunWater is required to prepare and maintain an Emergency Action Plan (EAP) for its referable dams, in accordance with the *Water Supply (Safety and Reliability) Act 2008* (Qld).[120] The EAP outlines foreseeable emergency events and what to do during an emergency.[121]

The Department of Energy and Water Supply (DEWS) is the dam regulator and has legislative responsibility for approving EAPs.[122] An EAP can be approved if the Chief Executive, DEWS is satisfied the plan complies with all legislative requirements and effectively deals with each emergency condition for the dam.[123]

The dam owner is required to provide a copy of the proposed EAP to the chairperson of the LDMG before it is submitted to the DEWS.[124] The LDMG can elect to provide feedback.[125] This can help ensure the EAP is not planned in isolation from the LDMP and that the LDMG understands the EAP.

The Callide Dam EAP has been provided to the Council and the LDMG previously.[126] Each year, the EAP must be reviewed prior to 1 October.[127] In accordance with the *Water Supply (Safety and Reliability) Act 2008* (Qld), the Council is given 10 days to provide written comment on the EAP.[128] The Council and the DEWS have both told us that 10 days is not long enough to properly consider the document.[129]

The Council's most recent feedback on the EAP in October 2014 included format changes, updates to contact details for LDMG members listed in the EAP, changing the content of the warning messages and adding explanatory notes for the inundation maps for the lay reader.[130] The Council did not receive a response from SunWater in relation to its feedback, although such feedback is not required.[131] The LDMG received a copy of the approved EAP. The DEWS' *Provisional Guidelines for Emergency Action Planning for Referable Dams* would suggest that further engagement should occur, but is silent on the benefits.[132] The development and revision of the EAP is an opportunity for stakeholders to ensure there is clarity on roles and responsibilities.

Emergency Action Plans roles and responsibilities

SunWater's EAPs for Callide and Kroombit dams clearly outline the internal roles and responsibilities for emergency management at the dams, but do not deal with wider disaster management response. In practice, disaster management arrangements are a shared responsibility.[133] The EAP does not need to outline the response expected of the LDMG, but it cannot be designed, planned and viewed in isolation only.

The legislative responsibilities of the dam owner in an EAP can be broken into three main areas:

- what will be done in response to an identified type of emergency
- the area that will likely be affected
- notification of people in that area likely to be affected, and relevant authorities.[134]

The DEWS has informed the review that *'there are no current requirements for dam owners to explicitly comply with an EAP during an event'*.[135] SunWater relies upon section 356A of the *Water Supply (Safety and Reliability) Act 2008* (Qld) for its adherence to the EAP, which states that dam owners must not contravene a dam safety condition.[136] SunWater's actions in regard to EAP compliance is discussed in more detail in the Warnings section of this report.

Hazard Identification and Risk Management

SunWater has identified five major risks to the dam, one of which is flood.[137] In this context, the flood risk relates to the chance that inflows into the dam overtop the dam walls, causing dam failure. The EAP identifies how the dam owner will respond if an emergency or a related event occurs.

The flood operations component of the EAP identifies a staged approach to managing the flood risk to the dam, ranging from preparing for a flood risk through to a 'Stage 5' event where overtopping of the dam wall is likely.[138] The triggers for each stage are clearly identified. The EAP also identifies contingency plans for emergency pump or gate failure.

Section 3 of the EAP contains the emergency contact plan, which identifies who to contact and when to contact them in the event of an emergency.[139] The communications plan is a staged contact list, whereby the classes of people to be contacted relate to the stage of the flood event and relevant trigger level. The list of people to contact includes the LDMG, other disaster management personnel, the dam owner, and downstream residents.[140]

The 2013 Water Solutions review made several recommendations for improvement to the operation of the Callide Dam by SunWater.[141] On 9 April 2013, SunWater responded to these recommendations, accepting several of them.[142] SunWater took steps to reduce the risk of identified issues re-occurring, such as pump failure and gate oscillation. These changes came at significant expense to SunWater.[143]

SunWater advised in 2013 that a recommendation relating to improved instrumentation and modelling of the catchment would be considered by SunWater if the reduced full supply level was *'maintained for an extended period of time'*.[144] Inflow modelling was underway prior to the 2015 event. SunWater advised that the models were not effective due to limited rainfall data for the area.[145]

SunWater has undertaken its own internal review of the operations of Callide Dam during the February 2015 event, as required by legislation.[146] SunWater is considering expanding the network of rainfall gauges, upgrading the tailwater gauge and introducing redundancies for communications at Callide Dam.[147] These upgrades are from lessons identified in the 2015 event, and demonstrate a commitment to continued risk assessment and hazard mitigation.

SunWater told us that Callide Dam (like many other SunWater dams) is excluded from the flood mapping coverage provided by SunWater's Flood Operations Centre.[148] This is a result of a risk assessment that had been completed previously on all dams.[149]

The EAP is comprehensive, but it is designed to be used by dam operators. A separate simplified explanatory document could be considered for community education purposes. This may achieve an incidental purpose for SunWater by enhancing community understanding of the capabilities and limitations of the Callide Dam, and improving confidence in its operation.

Emergency Action Plan review process

It is a requirement that each time the EAP is activated it is examined.[150] This examination is in the form of a comprehensive *Emergency Event Report* that is submitted to the DEWS. SunWater also conducts exercises as another method of review.[151] Exercise participants are internal to SunWater only.[152] The existing review processes used by SunWater for the EAP meet legislative requirements.

By doing no more than simply meeting the minimum legislative requirements, we consider that SunWater misses opportunities to improve engagement with the LDMG, and develop a mutual understanding of how responsibility for disasters involving referable dams can be shared. Internally-focused exercises do not allow the LDMG to be involved and obtain a practical understanding of the EAP. The DEWS has indicated that this is not the intention of its *Provisional EAP Guidelines*.[153] Increasing coordination between the LDMG and SunWater could also provide the LDMG members with familiarity with gate operations.[154]

Department of Energy and Water Supply

The role of the DEWS as dam safety regulator[155] necessarily entails a risk management approach. The regulator ensures dam owners protect the structural integrity of referable dams through various mechanisms, such as dam owners undertaking inspections, and conducting reviews of an emergency event.[156]

In order to do this, the DEWS undertakes programs to assess whether the dam owners have processes and procedures in place for dam inspections, review the safety of dams against current standards, and ensure monitoring and maintenance programs are maintained.[157]

Whilst the DEWS approves the EAP, it is the responsibility of the dam owner to operate the dam, including in emergent situations.[158] The DEWS does not have an operational role in the management of dams.[159] In emergency events, the DEWS will maintain awareness of the event and the risks for the particular dam.[160] In the event that an owner cannot obtain their own expert advice, the DEWS is available to provide advice.[161]

The DEWS told us that dam owners are *'free to undertake any actions they consider necessary to preserve the safety of the dam and subsequently the safety of people downstream during an emergency event'*.[162] This interpretation is at odds with SunWater's understanding and legislative interpretation, which is that it must adhere rigidly to the EAP.[163]

In relation to Callide Dam, the DEWS was made aware of safety concerns by SunWater in relation to the stability of the embankment prior to the 2013 flood event.[164] The DEWS was kept informed of the treatment strategies, including the implementation of a temporary full supply level and the subsequent gradual increasing of this level.[165] The DEWS concluded this was a prudent course of action to manage the risk to the safety of the dam.[166]

Whilst the DEWS does not take an active role in the management of referable dams, it does take steps as the regulator to ensure that risks are being identified, managed and mitigated where necessary. After the 2013 flood event, and associated concerns with the operation of the Callide Dam, the DEWS engaged Water Solutions to independently review the operation of the dam.[167] After the finalisation of the report, the DEWS maintained contact with SunWater to ensure progress was made in implementing the recommendations.[168] This contact was via correspondence and attendance by the DEWS at a SunWater workshop to discuss rectification issues.[169]

The specific details of the Callide Dam EAP have been outlined in the risk management approach of SunWater. The role of the DEWS in approving the EAP is to ensure that it contains:

- the emergency situations applicable to the dam
- what actions the owner must take to respond to each emergency
- the area likely to be impacted downstream
- which entities (including residents) are to be contacted during emergency situations.[170]

In order to assess if the EAP meets the conditions, the DEWS must undertake an assessment of the hazards likely to be present in a dam of Callide's design, and to assess whether the EAP adequately deals with them.[171]

The DEWS provided a significant amount of information to assist in this review. This information indicated that the DEWS undertakes assessments and audits of the documentation dam owners must compile and also conducts site visits to referable dams.[172] These audits are carried out on a rolling basis to ensure that all referable dams are visited in the order of priority, based upon parameters such as age of the dam, dam owner compliance history, dam structure and the associated risks and time since last audit.

The DEWS applies its published *Guidelines on Acceptable Flood Capacity for Water Dams*[173] to conduct quantitative risk assessments for assessing the risk of dam failure.[174]

The DEWS, therefore, applies a comprehensive risk analysis and management approach to its role as dam safety regulator.

Public engagement and communications

Effective public engagement should empower communities. Public engagement should be a two-way process, where entities and the community work together to understand, prepare for, respond to and recover from disasters.[175]

Key elements of effective public engagement include:

- Entities have a good understanding of the community profile, and how best to communicate with the community
- Community messages and education programs are delivered in plain language and use multiple modes of delivery
- Information is accurate, reliable, timely and relevant
- Systems are in place to address public enquiries and dispel myths
- Feedback is sought on public information and education activities.[176]

While the Council and SunWater both undertake some public engagement activities, there is room to improve these activities to better prepare the community for potential events and to build an understanding of risk.

Banana Shire Council

We found that there was significant scope for enhancing the Council's engagement with the community about disaster management. To improve, the Council could target specific communities or areas known to be at risk, such as areas prone to flooding. Engaging directly with these areas could assist residents to understand their risks, become better prepared, and enhance their disaster resilience. Prior to the 2015 event, some residents were completely unaware of their risks, such as that their properties were located on a floodplain.[177]

We were told of a disconnect between some residents' perceptions of risk and their expectations as to what will happen in an event.[178] For instance, during the event some residents took no action because they had not received any warning from the Council telling them that they were at risk.[179] This was despite being in close proximity to the Callide Dam and watercourses known (to the Council) to flood. Targeted public engagement prior to the event would have equipped these residents with the knowledge required to make informed decisions to better protect themselves and their property.

Above: Banana Shire Council disaster management preparedness information, 2014.

Banana Shire Council

Brochures and information about disaster preparedness and mitigation are provided at the Council's customer outlets. The information within these materials is largely generic and is not tailored to different groups within the community, such as culturally and linguistically diverse populations, or people with a hearing impairment.

Before the 2014/15 storm season, the Council distributed a *'community information and preparedness satchel to assist residents in preparing for an emergency or disaster event'*.[180]

Our survey of Callide Valley residents showed that 39% (n=158) of respondents had enquired about flood risk.[181] Of those who had sought flood risk information, only 10% (n=16) enquired with the Council.[182]

Above: Disaster management preparedness information (state and federal agency resources), available from Council outlets, 2015.

Inspector-General Emergency Management

Our interviews with various Council staff led us to believe that there is varying commitment to producing disaster management education materials.[183] While not everyone within the Council may share this view, to ensure that public engagement is effective, its value needs to be recognised by those with responsibility to prepare and disseminate materials to the community.

While it is a function of the LDMG to ensure the community is aware of ways of mitigating the adverse effects of an event, and preparing for, responding to, and recovering from a disaster,[184] the community also needs to inform itself about risks and to take action based on the range of information available.

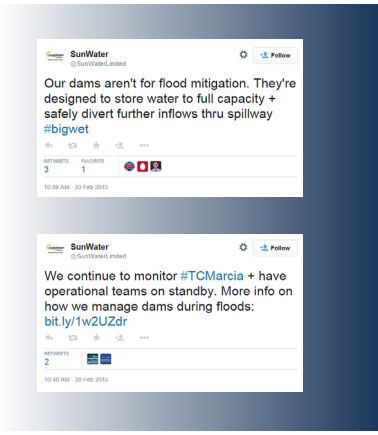
SunWater

SunWater uses several mediums to engage the community, from its online presence, including social media, to more traditional modes of information sharing. SunWater engages with the community through representation at interest group meetings, such as Irrigators' Advisory Committees, sponsorship and water safety education campaigns.[185]

The *2012/13 Annual Report* showed that one of SunWater's 'Key Result Areas' was *'External stakeholder relations – improving the confidence of external stakeholders, including customers and the community, in SunWater's ability to deliver on business operations'*.[186] The *2013/14 Annual Report* has seven outcomes, one of which is *'work collaboratively with key stakeholders to deliver government policy'*.[187]

A March 2015 publication, *Dam Management During Floods,* and website update provide basic information in response to *'public interest in the flood attenuation capabilities and safety of SunWater's 19 dams'*.[188] This is commendable, however there remains opportunity for SunWater to better convey its knowledge about risks to people downstream from its dams. For instance, there should be information on how or when the *'comprehensive communication protocols'*[189] operate and who will be given information during a flood event.

Engagement with the community on dams during floods is reflective of SunWater's position that the organisation has *'a limited role ... in emergency management'*.[190] This appears to be supported by the information provided in the SunWater publication *Dam Management During Floods*. The brochure does not mention that residents are *'relevant stakeholders'* and instead says SunWater provides updates to *'council, police, emergency services and counter disaster groups ... to ensure those agencies can fulfil their role of advising downstream residents'*.[191]



Above: SunWater tweets, 20 February 2015.
SunWater Limited

In the lead up to the February 2015 event, SunWater could have provided considerably more information and better engaged the community or local media about what was occurring at its dams, including the likelihood that the dams would spill. We found limited evidence of media releases and information on Facebook and Twitter.[192] The information provides the community with some understanding of the risks or likelihood of a risk occurring at its dams, but leaves room for improvement.

Early public engagement and an open dialogue about how the situation at the Callide and Kroombit dams was developing would have enabled the community to assess and respond to their personal risk. Had SunWater clarified common misconceptions, such as the belief among parts of the community that SunWater could pre-emptively release water at its discretion, or that the Council could order it to, much anxiety among the community may have been allayed.

Following criticism that SunWater had not engaged well with the Irrigators' Advisory Committee, we sought minutes of meetings with the group. SunWater told us that the group did not regularly meet but when it did, SunWater was represented.[193] Minutes from a 2014 meeting show four SunWater representatives and six advisory committee members in attendance.[194] SunWater was challenged on dam operations in circumstances of potential flooding rain and responded *'[it] has been fully investigated by an independent reviewer ... the dam was not designed for flood mitigation'*.[195]

SunWater's regular newsletter, *Newsplash*, is a good representation of the organisation's approach to public information and engagement. Dam safety messages to the public are often conveyed in the newsletter, but are generally about the recreational use of dams and weirs rather than residing downstream from a dam.[196] SunWater's preparations for wet weather and potential spilling are included, but no information is provided on what the community can do to prepare.[197]


QUARTERLY UPDATE July 2014

newsplash

SunWater

Recreation area handover benefits local community

(Left to Right) Sabbithy In The Bush President Don Morris, Deputy Premier, Minister for State Development, Infrastructure and Planning Jeff Seeney, SunWater General Manager Bulk Water Tom Vanderbyl, Banana Shire Council Mayor Ron Carige, celebrating the handover of the Callide Dam Recreation Handover on Friday May 30, 2014.

SunWater has recently handed over management of the Callide Dam Recreation area to Banana Shire Council.

Deputy Premier and Minister for State Development, Infrastructure and Planning, Jeff Seeney, handed over management of the recreation area to Banana Shire Council Mayor Ron Carige at a community gathering on Friday, May 30.

"By providing ownership of the Callide Dam's recreation area to Council, SunWater is exemplifying our government's belief that services are always delivered best when the local community is involved," Mr Seeney said.

"I am pleased to be here to mark the official handover and wish Banana Shire Council all the best with managing our dam's picturesque recreational area."

Banana Shire Council Mayor Ron Carige said the occasion goes hand in hand with the Council's message of being the Shire of Opportunity.

"The Banana Shire region is blessed with some of the greatest natural surroundings of inland Australia – and we want nothing more than to look after the community by providing great recreation facilities at dams such as Callide," Mayor Carige said.

SunWater Chief Executive Peter Boettcher said SunWater also recognises the community benefit of having facilities that allow the public to appreciate lakes and parks surrounding our dams.

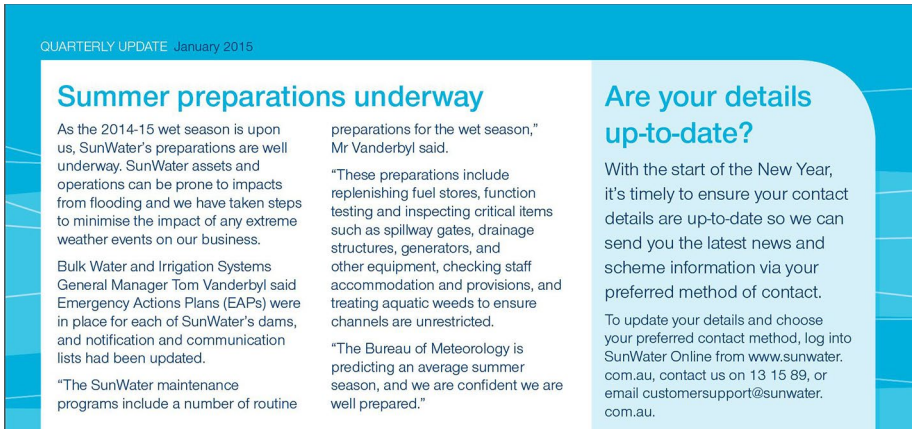
"It is good to see the Banana Shire Council has committed to taking over management of what is not just a recreation area, but an area for the whole community to relax and appreciate," Mr Boettcher said.

Mr Boettcher went on to say that he was impressed by the collaborative nature in which SunWater and the Banana Shire Council staff worked together to achieve this important result for the community.

Local councils have successfully taken over the recreational areas of a number of SunWater Dams for the benefit of their local community. These include:

- Tinaroo Falls Dam (Tablelands Regional Council)
- Boondooma Dam (South Burnett Regional Council)
- Paradise Dam & Cania Dam (North Burnett Regional Council)

MAKING WATER WORK


QUARTERLY UPDATE January 2015

Summer preparations underway

As the 2014-15 wet season is upon us, SunWater's preparations are well underway. SunWater assets and operations can be prone to impacts from flooding and we have taken steps to minimise the impact of any extreme weather events on our business.

Bulk Water and Irrigation Systems General Manager Tom Vanderbyl said Emergency Actions Plans (EAPs) were in place for each of SunWater's dams, and notification and communication lists had been updated.

"The SunWater maintenance programs include a number of routine preparations for the wet season," Mr Vanderbyl said.

"These preparations include replenishing fuel stores, function testing and inspecting critical items such as spillway gates, drainage structures, generators, and other equipment, checking staff accommodation and provisions, and treating aquatic weeds to ensure channels are unrestricted.

"The Bureau of Meteorology is predicting an average summer season, and we are confident we are well prepared."

Are your details up-to-date?

With the start of the New Year, it's timely to ensure your contact details are up-to-date so we can send you the latest news and scheme information via your preferred method of contact.

To update your details and choose your preferred contact method, log into SunWater Online from www.sunwater.com.au, contact us on 13 15 89, or email customersupport@sunwater.com.au.

Examples of SunWater's Newsplash July 2014 (above) edition and (left) items from the January 2015 edition.
SunWater

Finding 3

Improvements to Banana Shire Council's approach to flood risk management, including town planning, are dependent upon the Council having access to fit-for-purpose flood studies.

Finding 4

Of those surveyed, 55% indicated they had limited or no knowledge of disaster management arrangements.

Finding 5

It is difficult for residents to easily understand the implications of an Emergency Action Plan activation.

Finding 6

Believing there to be no legal option, SunWater followed the Emergency Action Plan, despite having information regarding emerging risks to downstream residents.

Finding 7

In relation to warnings, SunWater's understanding of Emergency Action Plan compliance requirements is divergent to that of the Department of Energy and Water Supply, which supports the notion of flexibility to deal with emergent conditions.

Recommendation 3

Banana Shire Council coordinates the development of a strategy to significantly enhance public education regarding local disaster management arrangements within the Banana Shire, focusing on key identified risks.

Recommendation 4

SunWater provide downstream residents with easily understood information regarding operation of the dam, and the impacts that various outflows may have for them, in accordance with mapping prepared for the Emergency Action Plan. This information should be complementary to any information from the Banana Shire Council.

Recommendation 5

The Department of Energy and Water Supply, in conjunction with SunWater, seek clarification of the dam owners' legal obligation to comply with Emergency Action Plans and, if required, investigate how a more flexible approach may be adopted.

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