EMERGENCY ACTION PLAN

LAKE MITCHELL DAM

Southedge Lakes Project

July 2020 Version 2020/7

Approved by the delegate of the Chief Executive, Department of Natural Resources, Mines and Energy until 1 September 2022.
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LAKE MITCHELL DAM
EMERGENCY ACTION PLAN July 2020

Registered dam ID: 521
Current as at: 16\textsuperscript{th} July 2016
Approved to: 1\textsuperscript{st} October 2018

Dam owner

Name: Owner - Southedge Pastoral Company Pty Ltd - Manager
Date: 25\textsuperscript{th} July 2020

1.0 APPROVAL AND AUTHORISATIONS

<table>
<thead>
<tr>
<th>Prepared by</th>
<th>Title</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Representative – North Australian Water Strategies, Mareeba –</td>
<td>Company Representative</td>
<td>25/07/2020</td>
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<table>
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<td>/ /2020</td>
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<tr>
<td>Chair Mareeba Shire Local Disaster Management Group</td>
<td>/ /2020</td>
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<tr>
<td>Senior Executive Support Officer, Mareeba Shire Local Disaster Management Group</td>
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Emergency Action Plan for Lake Mitchell Dam

EAP version 2020 v5....Approved: Date:
## Distribution list

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<td>Southedge Pastoral Company Pty Ltd&lt;br&gt;Manager: &lt;br&gt;35 Lake Street (PO Box 1644), Cairns, Qld. 4870</td>
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<td>Emergency contacts</td>
<td>North Australian Water Strategies&lt;br&gt;Company Representative&lt;br&gt;J T Smith &amp; Associates, Company Engineer</td>
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<tr>
<td>Mareeba Local Disaster Management Group</td>
<td>Senior Executive Support Officer&lt;br&gt;Mareeba Shire Council&lt;br&gt;65 Rankin Street, Mareeba Qld. 4880</td>
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<tr>
<td>Mareeba Local Disaster Management Group</td>
<td>Executive Officer Mareeba LDMG&lt;br&gt;Qld. Police Service&lt;br&gt;Walsh St. Mareeba QLD 4880</td>
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<td>Chief Executive Officer, Mareeba Shire Council</td>
<td>Mareeba Shire Council&lt;br&gt;65 Rankin Street&lt;br&gt;Mareeba Qld. 4880</td>
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<tr>
<td>Dam Safety Regulator, DNRME</td>
<td>Director, Dam Safety&lt;br&gt;Water Planning and Regulation&lt;br&gt;Department of Energy and Water Supply&lt;br&gt;PO Box 15456&lt;br&gt;City East Qld. 4002</td>
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LAKE MITCHELL DAM
EMERGENCY ACTION PLAN July 2020

DISTRIBUTION CONTROL SHEET

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<tr>
<td>Company Site Supervisor/Dam Operator, Mount Molloy</td>
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<td>Company Representative – North Australian Water</td>
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<td>Company Engineer – J T Smith &amp; Associates, Malanda</td>
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<tr>
<td>Director Dam Safety,</td>
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<td>Department of Natural Resources Mines and Energy,</td>
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<tr>
<td>Local Disaster Coordinator,</td>
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<tr>
<td>Executive Manager,</td>
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<td>Queensland Police Service – Mareeba</td>
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<td>Community, Mount Molloy Contact: Mount Molloy Service Centre</td>
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<tr>
<td>Community, Mount Carbine Contact: Mount Carbine</td>
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# REVISION STATUS

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<td>Emergency Action Plan 2013, prepared for the Lake Mitchell Dam, Southedge Lakes Project</td>
<td>Office of the Water Supply Regulator, Department of Natural Resources and Mines and others as listed on the Distribution Control Sheet</td>
<td>February, 2013</td>
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<td>5</td>
<td>REVISION Emergency Action Plan 2015, prepared for the Lake Mitchell Dam, Southedge Lakes Project</td>
<td>Mareeba Local Disaster Management group; Queensland Water Supply Regulator, Department of Energy and Water Supply, Brisbane</td>
<td>August 2015</td>
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<td>9</td>
<td>REVISION Emergency Action Plan 2018, prepared for the Lake Mitchell Dam, Southedge Lakes Project</td>
<td>Mareeba Local Disaster Management group; Queensland Water Supply Regulator, Department of Energy and Water Supply, Brisbane</td>
<td>October 2018</td>
</tr>
<tr>
<td>10</td>
<td>REVISION Emergency Action Plan 2020, prepared for the Lake Mitchell Dam, Southedge Lakes Project</td>
<td>Mareeba Local Disaster Management group; Queensland Water Supply Regulator, Department of Energy and Water Supply, Brisbane</td>
<td>July 2020</td>
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</table>
2.0 INTRODUCTION

This Emergency Action Plan (EAP) addresses the potential consequences of the failure of Lake Mitchell Dam and the possibility of a failure and/or a major flood affecting properties downstream. It sets out the procedures that the Southedge Pastoral Company, (The Company), operations and technical personnel will follow in the event of an emergency.

It is intended that timely advice or warning will be provided to local emergency management agencies to enable them to formally advise the downstream community and take whatever action might be necessary to protect the downstream community.

Notwithstanding that the local emergency management agencies will be advising the downstream community in the event of an emergency, Lake Mitchell company personnel will also advise the downstream community in the event of an emergency so that they are afforded the maximum opportunity to take whatever action might be necessary to ensure their personal safety.

The downstream community is well spread out and persons on grazing properties away from the small towns of Mount Molloy and Mount Carbine, on the Mulligan Highway, are few.

Lake Mitchell is a referable dam Failure Impact Rating of Category 1, as assessed by J T Smith and Associates in 2016. Sunny day failure or flood failure of the embankments have been determined to impact residents in the downstream township of Maryfarms requiring evacuation from houses. No other people or property is assessed to be at risk from such events.

The EAP indicates who is responsible for undertaking particular actions under emergency circumstances, and it is tailored to the conditions that exist at and around Lake Mitchell.

3.0 OWNERSHIP AND ENTRY

3.1 Ownership Details

Southedge Daintree Pastoral Company and Weymouth Pastoral Company Pty Ltd,
35 Lake Street (PO Box 1644),
Cairns, Qld 4870
Manager

3.2 Company Contact Details

<table>
<thead>
<tr>
<th>North Australian Water Strategies</th>
<th>Company Representative</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Site Supervisor/Dam Operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>3196 Mulligan Highway Southedge, Qld, 4871</td>
</tr>
</tbody>
</table>

| J T Smith & Associates | Dam Engineer |

J T Smith and Associates Pty Ltd, November 2016. LAKE MITCHELL DAM FAILURE IMPACT ASSESSMENT prepared for Southedge Pastoral Company Pty Ltd
3.3 Entry to Lake Mitchell Dam

Location of Keys to Gates

The access gate to Lake Mitchell is kept locked for safety and security reasons.

Keys to the locked gate are held by:

- Site Supervisor/Dam Operator
  3196 Mulligan Highway Southedge, Qld, 4871
  and

- At the Company Office, 35 Lake Street, Cairns

3.4 Access to Lake Mitchell Dam

Emergency services personnel are advised to contact the Company’s Site Supervisor/Dam Operator, to obtain access through the locked gate.

Access to Lake Mitchell is gained via the well-made property access road at rural address #2717 Mulligan Highway. The dam conduit is approximately 4.5 km from the property entrance. The time required to reach the dam conduit from the Mareeba Post Office via this route is approximately 25 minutes.

The above route, via Mareeba, is the most direct road access to Lake Mitchell for Cairns-based emergency services personnel. The time required to travel from the Cairns CBD to Mareeba via the Kennedy Highway and thence to the dam conduit approximately 1.25 hours.

Alternative road access to Lake Mitchell for Cairns-based emergency services personnel is via the Cook Highway (Julatten turnoff, south of the town of Mossman), the Rex Highway to Mount Molloy, and then along the Mulligan Highway South to rural address #2717. See (Figure 1). The distance from the Julatten turn-off, south of the town of Mossman to the dam conduit is approximately 60 km and the time required to travel this route is approximately 1.5 hours.

Access to Lake Mitchell by helicopter can be gained under extreme rainfall conditions.
Figure 1: Road Access from Mareeba
## 4.0 DAM DESCRIPTION

<table>
<thead>
<tr>
<th><strong>Dam name:</strong></th>
<th>Lake Mitchell Dam</th>
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<tr>
<td><strong>Referable dam register no.:</strong></td>
<td>Dam Identification Number 521</td>
</tr>
<tr>
<td><strong>Owners name:</strong></td>
<td>Southedge Pastoral Company Pty Ltd – Manager</td>
</tr>
<tr>
<td>** Owners phone no.:**</td>
<td>[Redacted]</td>
</tr>
<tr>
<td><strong>Emergency contact name:</strong></td>
<td>Site Supervisor/Dam Operator</td>
</tr>
<tr>
<td><strong>Emergency contact phone no.:</strong></td>
<td>[Redacted]</td>
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<tr>
<td><strong>Stream name:</strong></td>
<td>Mitchell River</td>
</tr>
<tr>
<td><strong>Reservoir name:</strong></td>
<td>Lake Mitchell</td>
</tr>
<tr>
<td><strong>Construction completed:</strong></td>
<td>1989</td>
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<tr>
<td><strong>Type of dam</strong></td>
<td>Compacted clay dam, constructed in two sections (primary embankment and secondary embankment)</td>
</tr>
<tr>
<td><strong>Primary Embankment</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Length 530 m (clear of spillways);</td>
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<tr>
<td></td>
<td>• Height – 16.5 m (maximum).</td>
</tr>
<tr>
<td></td>
<td>• Batter slopes: 1V/3H steepened to 1V/2H above Probable Maximum Flood (PMF) level upstream, and 1V/2H downstream batter slope</td>
</tr>
<tr>
<td><strong>Secondary Embankment</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Length 1150 m;</td>
</tr>
<tr>
<td></td>
<td>• Batter slopes: 1V/3H steepened to 1V/1½ H above PMF level upstream, and 1V/1½ H exposed downstream batter slope</td>
</tr>
<tr>
<td><strong>Total length of embankments and spillways</strong></td>
<td>1,980 m</td>
</tr>
<tr>
<td><strong>Slope protection</strong></td>
<td>Rolled and compacted topsoil, grassed slopes</td>
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<tr>
<td><strong>Purpose of dam</strong></td>
<td>To support commercial and residential development, with associated recreation</td>
</tr>
<tr>
<td><strong>Dam Catchment Area</strong></td>
<td>320 km²</td>
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<tr>
<td><strong>Storage capacity</strong></td>
<td>159,120 ML at Spillway A level</td>
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### Dam Height

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<th>Primary Embankment</th>
<th>Secondary Embankment</th>
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<td>16.5 m (maximum)</td>
<td>14.2 m (maximum)</td>
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### Dam Crest Level and Width

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<th>Full Supply Level</th>
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<tr>
<td>EL 381.0m Australian Height Datum (AHD) 5 metres wide</td>
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### Spillway Type and width

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<th>Spillway Type and width</th>
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<tr>
<td>Spillway A is 180 m long, 3 m wide and is the primary spillway. It is a broad crested weir consisting of an earth embankment with a concrete slab cap and heavy rock armouring on the apron. The crest of Spillway A is at EL 376.6m AHD. Spillway B is also a broad crested weir consisting of an earth embankment with rock rip-rap cap and a crest width of 3 m. It is 120m long. The crest of Spillway B is at EL 377.5m AHD</td>
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### Maximum Spillway Discharge

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<tr>
<td>3,252 m³/s at PMF level (EL 379.8m AHD)</td>
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### Outlet structure

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<th>Outlet structure</th>
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<tbody>
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<td>The outlet conduit is a 1.8 m x 1.5 m, cast in situ, reinforced concrete box conduit with an inlet chamber, hydraulic gates, and gantry and outlet structure. The conduit and outlet race are excavated in the central hill between the primary and secondary embankments (i.e. away from the constructed dam wall embankments).</td>
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### Population at risk (PAR) as determined by HEC-RAS flood modelling

<table>
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<th>Sunny Day</th>
<th>Flood failure</th>
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<td>3</td>
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Spillway discharges for each spillway and in combination are presented in Appendix 1.

### 5.0 MONITORING

Two key elements are monitored by company staff – dam water level and rainfall.

Lake Mitchell Dam is monitored on a regular basis as follows:

- The Site Supervisor/Dam Operator visits and visually inspects the dam and its infrastructure on a minimum weekly basis (and in most cases, more regularly). The Site Supervisor has been trained to observe embankment condition, evidence of seeps, boggy patches, and other unusual discharge of water from the dam, slumping, sliding, unwanted vegetation growth in the dam walls and to check on the water level in the dam (using a graduated gauge-board at the outlet structure).

- Pre and post-wet season engineering inspections of the dam by a registered professional engineer (Queensland).

- Interrogation of the water level in the dam using an Aquaguage water level sensor installed at the outlet structure. The water level in the dam is measured via a gauge-board on the platform support at the outlet structure and the Aquaguage differential water level sensor and Electrosense M2M data manager installed at the outlet gate The M2M data manager is capable of being interrogated via the 3G network via a mobile telephone.
Regular download of daily rainfall data from Bureau of Meteorology Station 31188 (Mareeba TM), up to the end of December, 2019 and from January 2020, data from a private weather-station operated by Marcello Avolio at Gorge Creek Orchards at Paddy’s Green. This rainfall data is correlated with the Aquagauge water level data (Figure 2);

![Figure 2: Correlation of Aquagauge Water Levels and Rainfall at Mareeba (BOM station 31188)](image)

5.1 Monitoring Reference Points

Two reference points have been assigned for monitoring of Lake Mitchell Dam should emergency situations develop. These are shown in Figure 3.

The reference point for primary embankment failure is expected to be the principal reference point. In the event of secondary embankment failure or failure of both embankments, the reference point will be the secondary reference point, as access to the primary reference point will not be possible. The reference points are shown in Figure 3.
Intensive monitoring of dam conditions by the Site Supervisor/Dam Operator occurs during high rainfall periods. In addition monitors the condition of the dam on a daily basis by visual inspection. A synopsis of monitoring activities at Lake Mitchell Dam is presented below.

5.2 Monitoring Accessibility

The Company considers that on-site monitoring is possible even during 1 in 20 and 1 in 50 ARI events owing to the all-weather access road from the Mulligan Highway to Lake Mitchell.

Should an emergency situation appear imminent, access to the dam will be by one of the following mechanisms:

- The Company’s Site Supervisor will access the site by road from the Mulligan Highway and report on the situation to The Company’s Dam Engineer;
- The Company’s Site Supervisor and Dam Engineer will access the site by road from the Mulligan Highway if required;
- If road access is not possible (this could occur above a 1 in 50 ARI event), The Company’s Dam Engineer will access the site by helicopter.

5.3 Visual Inspections

Visual inspections are undertaken on an almost daily basis by The Company’s Site Supervisor and Dam Operator. The Site Supervisor is a long-term employee of The Company and he has lived in the Lake Mitchell area for over 30 years. He was present throughout all stages of construction of Lake Mitchell Dam and is therefore familiar with both pre-dam and post-dam conditions.
Regular periodic safety inspections of the dam (including pre-wet season and post-wet season) are made by the Site Supervisor accompanied by The Company's Dam Engineer (RPEQ).

The periodic inspections consider situations that could possibly affect the integrity of the dam and are carried out as follows.

**Wave Erosion**

After periods of heavy rainfall and on an annual basis after the wet season, the up-stream batters of the embankments are inspected for beaching, slumping and rutting.

**Toe Erosion**

After periods of heavy rainfall and on an annual basis after the wet season, the down-stream embankment batters are inspected for damage to rock armouring and vegetation cover.

**Gullying**

After periods of heavy rainfall and on an annual basis after the wet season, the outer toes of the embankments are inspected for erosion and seepage.

**Loss of Storage and Seepage**

During routine monitoring, embankment batters and the areas at the toes are inspected for seepage, increased ground water levels near the storage, vegetation loss and salt scalds.

**Seepage Erosion and Piping**

During routine monitoring, the lower areas of the embankments and toes are inspected for seepage and discharge points.

**Appearance of New Springs, Seeps and Boggy Areas**

During routine monitoring, the lower areas of the embankments and areas in front of the toes are inspected for “evergreen” or boggy spots and expressions of groundwater or pools of surface-water.

**Rapid Increases or Cloudy Appearance of Seepage**

Routine monitoring also observes any increase in seepage flows, pools of water and the source of any cloudy water.

**Foundation Failure**

On an annual basis after the wet season and during routine monitoring, inspect for signs of change in dam profile, foundation movement or displacement immediately adjacent to the dam.

**Slide/s in Downstream Slope**

On an annual basis after the wet season and during routine monitoring, inspect for cracks, scarps or slumping near the crest and changes in profile around the embankment toes.
Flow Slide

On an annual basis after the wet season and during routine monitoring, inspect for material displacement around the rim of the storage.

Landslide

On an annual basis after the wet season and during routine monitoring, look for material displacement from the hill slopes and valley walls around the storage.

Movement or Cracking in Structural Concrete Work

During routine inspection of the conduit or when mechanical problems occur with the gantry or gates, look for movement or cracking in the structural concrete and determine the cause.

Failure of Conduit Structure or Operating Equipment

Investigate loss of ability to release water to downstream wetlands and the Mitchell River and determine the cause.

The Company’s Site Supervisor accompanies the Dam Engineer on the periodic inspections of the dam and its associated features. He has been given instruction on recognition of potential dam failures (e.g. piping or embankment erosion) during these periodic inspections.

5.4 Climate Event Monitoring

The Company Representative monitors any threatening climate events, (e.g. cyclones and tropical lows), by means of the Bureau of Meteorology warning service and climate data on-line.

5.5 Rainfall Monitoring

The Company Representative is responsible for monitoring rainfall that may impact on storage levels in Lake Mitchell. Regular downloading of daily rainfall data from Bureau of Meteorology Station 31188 (Mareeba TM), and the Gorge Creek private rainfall station is undertaken.

6.0 DAM HAZARD EVENTS AND DAM EMERGENCY EVENTS

The potential dam hazards associated with Lake Mitchell Dam are as follows:

1. ‘Sunny day’ embankment failure, being embankment failure that is not attributed to extreme rainfall events;
2. Flood failure as a result of extreme rainfall events in the dam catchment;
3. Embankment rupture and failure under earthquake conditions;
4. Embankment rupture and potential failure as a result of terrorism, vandalism or high energy impact; and
5. Embankment or dam infrastructure failure owing to aging dam infrastructure. Such hazards will be detected during routine engineering inspections and observations by the Site Supervisor (made at least weekly).

6.1 Dam Hazard Events

**Dam hazard events** may be considered as routine or non-threatening occurrences and will generally occur over a considerable time-frame. Hazard events will be associated with:

1. Embankment or dam infrastructure failure owing to aging dam infrastructure;
2. Spillway Discharges;
3. Piping through the Outlet Conduit;
4. Minor Piping through Embankments; and
5. Downstream Discharge Impacts.

**Embarkment or dam infrastructure failure owing to aging dam infrastructure**

Any gradual degradation of infrastructure will be monitored during routine inspections. Maintenance and repairs will be carried-out in a timely manner. This type of failure is unlikely to require a coordinated response with one or more relevant entities.

**Spillway Discharge**

As shown above, the maximum discharge through Spillway A and Spillway B, in combination, is about 3,200 m$^3$/s. If there is no embankment failure, this discharge will cause moderate flooding in the Mitchell River which will attenuate as it progresses downstream from Lake Mitchell.

**Piping through the Outlet Conduit**

Dam failure through the outlet conduit is considered to be unlikely as the conduit was constructed through bedrock. The outlet conduit is only 5 metres wide and is lined with concrete for the width of the primary embankment. Even in the worst case scenario; i.e. the installed gateworks were to be washed out via piping failure, the relatively narrow conduit would limit the resulting out-flow.

**Piping through Embankments**

Lake Mitchell Dam was constructed in 1989 and has, for most of the time since 1990, remained at or near full supply level. Regular dam condition inspections have been, and are being, conducted by a registered professional engineer (Queensland), with experience in assessment of large dams. There has been no evidence of piping through the embankments since the dam was constructed.

**Downstream Discharge Impacts**

In 2016 a discussion was held with the Mareeba Shire Local Disaster Management Group (LDMG) regarding downstream discharge impacts. No downstream discharge impacts were identified during that discussion. In addition the LDMG advised at that time that the Australian Wildlife Conservancy (the curators of Brooklyn Wildlife Reserve) patrol the Mitchell River to ensure that unauthorised persons are not present in the river precincts. There have been no changes to this policy. This adds an additional safety measure to this EAP.
6.2 Dam Emergency Events

Dam emergency events may be considered as sudden, short-duration occurrences, during which persons or property may be harmed.

A coordinated response is likely to be required to respond to the event. A disaster is declared under the Disaster Management Act, or an entity performing functions under the State Disaster Management Plan may require the owner of the dam to give the entity information about the event. Such an event may be associated with:

1. ‘Sunny day’ embankment failure (embankment failure that is not attributed to extreme rainfall events);
2. Flood failure under extreme rainfall events in the dam catchment;
3. Embankment rupture and failure under earthquake conditions; and
4. Embankment rupture and potential failure as a result of terrorism, vandalism or high energy impact;

Key storage levels that will act as action triggers are:

- Normal operating level (EL 375.8 m AHD);
- The level of Spillway A (EL 376.6 m AHD);
- Mulligan Highway lowest level (EL 377.8 m AHD); and
- Embankment crest level (EL 381.0 m AHD)

Sunny Day and Flood Failure

Dam failure impact zones were determined for Lake Mitchell Dam by J T Smith and Associates in 2016.

The HEC-RAS modelling package, (version 5.0.3, September 2016), was used to simulate Sunny Day and Flood Failure scenarios. The potential peak water surface elevation at Maryfarms resulting from sunny day failure is EL 352.8 m AHD.

Figure 4 shows the inundation zone for the modelled sunny day failure scenario.

It should be noted that under the sunny day failure scenario inundation will be 0.7 km from the “Font Hill” Station home-stead and will impact the “Brooklyn” Station homestead by about 0.5 metre. Modelling indicates that flood water will take 36 hours to reach Brooklyn after embankment failure. The modelling further indicates that inundation under this scenario may persist for up to 12 hours (see Appendix 16).
Figure 4: Sunny Day Failure Impact Zone
(from J T Smith and Associates 2017)

Figure 5 shows the inundation zone for the modelled flood failure scenario.

It should be noted that under the flood failure scenario inundation will be 0.4 km from the “Font Hill” homestead and will impact “Brooklyn” home-stead by about 3.3 metres above the natural surface. The depth of inundation reduces to zero about 0.9 km up-stream of the Mary Ck. bridge at the Mulligan Highway. The potential peak water surface elevation at Maryfarms resulting from flood failure is EL 355.8 m AHD. Modelling indicates that flood water will take 36 hours to reach Brooklyn after embankment failure.
The residence at “Font Hill” is unoccupied, whereas residences at “Brooklyn” and Maryfarms are occupied.

Figure 6 shows the downstream properties that may be affected in the event of either sunny day or flood failure. These locations have been determined by flood modelling. Only properties in the Maryfarms area are at risk. No other properties are at risk of flood impacts.

In view of the time of arrival of flood water at Maryfarms the best direction of escape is towards Mount Molloy.
Appendix 16 shows the progressive development of the flood plume under the flood failure scenario.

The limitations on accuracy of the forecasting are outlined in Appendix 3.

**Overtopping and Flood Failure**

Lake Mitchell Dam was designed so that the 1 in 100 year average recurrence interval (ARI) flood level and the estimated PMP flood level were both below the crest level of the dam; EL 381.0m Australian Height Datum (AHD). A potential blockage of the conduit would not change this conclusion.
J T Smith and Associates 2016 estimated the Probable Maximum Flood (PMF) flood level to be EL 379m AHD, which is 2 metres below the dam’s crest level: (EL 381.0m AHD). Embankment failure by overtopping is not considered to be possible for Lake Mitchell Dam.

**Embankment Failure as a Result of Earthquake**

Lake Mitchell Dam is constructed in an area that has been tectonically stable for billions of years. The probability of earthquake is considered to be very low. The notifications and actions resulting from failure of Lake Mitchell Dam as a result of earthquake are very similar to those for sunny day failure.

**Embankment Failure as a Result of Vandalism, Terrorism or High Energy Impact**

The notifications and actions resulting from failure of Lake Mitchell Dam as a result of vandalism, terrorism or high energy impact are very similar to those for dam failure as a result of earthquake, with the exception that Queensland Police Service may be the primary response agency.
The following persons / organisations in the event of an extreme rainfall event or an emergency due to failure of the dam, in priority order.

<table>
<thead>
<tr>
<th>Relevant agencies</th>
<th>Priority order^4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td><strong>Location</strong></td>
</tr>
<tr>
<td>Company contacts</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Company Representative</td>
<td>North Aust. Water Strategies</td>
</tr>
<tr>
<td>Dam Engineer</td>
<td>J T Smith &amp; Associates</td>
</tr>
</tbody>
</table>

---

^2 Important contacts may require multiple lines of contact to ensure some redundancy is provided in order to maximize the reliability of contact being made.

^3 Notification requirements of the dam owner will need to be determined on a case by case basis in association with the Local Disaster Management Group.

^4 The priority order of notification should take account of the response required by the notification receiving entity during the emergency.
## Relevant agencies

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Contact details</th>
<th>Notification requirement</th>
<th>Priority order&lt;sup&gt;4&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Disaster Management Group</td>
<td>Mareeba Shire Council Offices 65 Rankin Street Mareeba</td>
<td></td>
<td>To be notified by the Company representative if remote water level or rainfall monitoring indicates imminent emergency conditions.</td>
<td>1</td>
</tr>
<tr>
<td>Executive Manager, Queensland Fire and Emergency Services</td>
<td>Emergency Management Qld, Fire and Emergency Services, Cairns</td>
<td>Executive Manager Ph: 4032 8688 (24 hours)</td>
<td>To be notified by the Company representative if remote water level or rainfall monitoring indicates imminent emergency conditions. If necessary request Senior Executive Support Officer (LDMG) to advise EMQ as well.</td>
<td>1</td>
</tr>
<tr>
<td>Local Police Station</td>
<td>Queensland Police Service Walsh Street Mareeba</td>
<td>000 or 4030 3330 (24 hours)</td>
<td>When an evacuation is required or vandalism, terrorism or high energy impact scenarios occur. To be notified by the Company representative if remote water level or rainfall monitoring indicates imminent emergency conditions</td>
<td>2</td>
</tr>
<tr>
<td>Local Council</td>
<td>Mareeba Shire Council Offices 65 Rankin Street Mareeba</td>
<td>CEO 1300 308 461</td>
<td>To be notified by the Company representative if remote water level or rainfall monitoring indicates extreme rainfall. The Peninsula Development Road south of Quaid’s Road may be inundated prior to any embankment failure e.g. when the dam water level reaches 377.8m AHD).</td>
<td>3</td>
</tr>
</tbody>
</table>
| Chief Executive (Dam Safety Regulator, DNRME)  | Brisbane                                      | 1300 596 709    | ● Advise of details of activation of EAP to ‘Stand-up’ level of activation.  
● Keep informed of any changes in dam status as emergency situation develops.  
● Notify any incidents or failures in accordance with safety conditions, if applicable, where applied to the dam. | 4                        |
● Access website during a rainfall event to predict the impact of flows from the catchment. | 4                        |

Section 7.1 has been redacted
8.0 **DAM HAZARD AND EMERGENCY EVENT ESCALATION TABLES**

8.1 **Flooding**

Table 1: Flood/dam failure flood: actions and notification

<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Developing flood in the dam catchment</th>
<th>Actions and notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALERT</td>
<td>Significant rainfall in catchment with lake levels rising towards FSL and a spillway discharge expected. Significant rainfall event up to a 1 in 20 year rainfall (250mm of rainfall at Mareeba BOM station 31188 or Gorge Ck. private weather station)</td>
<td>• Remotely download dam water level data from Aquagauge water level sensor on a 3-hourly basis&lt;br&gt;• Assess situation and request company engineer to proceed to Lake Mitchell&lt;br&gt;• Maintain twice daily contact with company Site Supervisor/Operator&lt;br&gt;• Provide advice to Local Disaster Management Group if emergency appears imminent; escalate EAP to Stand Up level; issue warnings to downstream residents&lt;br&gt;• Site Supervisor to undertake visual inspection of dam and manual recording of water level of the dam at regular intervals.&lt;br&gt;• Company Representative to monitor rainfall activity on the BOM radar.</td>
</tr>
<tr>
<td></td>
<td>Dam water level reaches 376.3m AHD and is likely to continue rising</td>
<td>• Dam Engineer to travel to Lake Mitchell Dam and meet with Site Supervisor/Operator. Proceed to dam and undertake condition assessment&lt;br&gt;• Assess situation on site and contact Company Representative by telephone&lt;br&gt;• <strong>Company Representative to provide Advice Notification to the LDMG</strong>&lt;br&gt;• Site Supervisor to phone PAR and follow up by door-knocking if safe to do so. (The intent of the message is to advise PAR that there is no immediate danger however, they should keep themselves up-to-date with developments)</td>
</tr>
<tr>
<td>Emergency triggers</td>
<td>Developing flood in the dam catchment</td>
<td>Actions and notifications (as agreed with Mareeba Local Disaster Management Group)</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| LEAN FORWARD      | Spillway flows increasing but as yet are unlikely to impact on downstream PAR and infrastructure. **Major rainfall event between a 1 in 20 and 1 in 50 year rainfall (up to 310mm of rainfall at Yalkula); Tropical cyclone event ... or Dam water level reaches EL377.6m AHD (1m above Spillway A level) and is likely to continue rising** | • Remotely download dam water level data from Aquagauge water level sensor on a 3-hourly basis  
  • Keep Dam Engineer informed on flood levels and spillway overflow  
  • Site Supervisor to monitor the situation at the dam (storage levels, etc). Identify any changes in dam condition ((visual inspection). Also continue monitoring and manual recording of water level of the dam  
  • Site Supervisor to accompany Dam Engineer on condition assessment inspection  
  • Site Supervisor and/or Dam Engineer to advise dam owner on severity of flood situation and condition of dam under prevailing flood conditions  
  • Company Representative to contact LDMG and discuss the potential for escalation to Stand Up status  
  • Company Representative to request Site Supervisor to notify potentially affected downstream community either by telephone or in person if safe to do so  
  • **Preliminary Warning Watch and Act:**  
    - In conjunction with LDMG, update notifications to those who received previous notifications plus notifications to the Chief Executive and those who might be impacted by increasing spillway discharges.  
    - The message to convey that it is likely that they will be impacted by the emergency. That they will be in danger and should start taking action to protect lives.  
    - Updates will be provided every 4 hours, or more frequently if deemed appropriate. |
<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Developing flood in the dam catchment</th>
<th>Actions and notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
</table>
| STAND-UP           | Spillway discharge increasing with flows that are likely to impact on downstream PAR and infrastructure. If flood activity continues a dam failure may occur due to overtopping. Dam failure is initiated. | • Company staff to continue dam inspections, monitoring and recording of water level of the dam at more frequent intervals if safe to do so.  
• Request LDMG to issue emergency alert to PAR to evacuate to high ground to avoid any impending flood / dam failure flows.  
• Company Representative to issue more frequent notifications to all relevant entities including the LDMG and Chief Executive. Updates to be provided at least every few hours but also when ‘benchmark’ lake levels or discharge are being reached such as:  
  o discharges likely to close critical roads and other infrastructure  
  o record flood levels are occurring in the dam  
  o water level approaching embankment crest level  
• **Warning message:**  
  o Prepare to take action messages to all relevant entities and PAR  
• **Emergency Warning:**  
  o Request LDMG to issue an emergency alert (EA) for Maryfarms area for flood failure situation. The text of such a request is shown in Appendix 4.  
  o Take immediate action messages to all relevant entities, PAR and the wider community. Note that Maryfarms properties are not expected to be impacted until about 36 hours after embankment failure occurs.  
• Site Supervisor or Dam Engineer to immediately notify the LDMG and other relevant entities when the dam failure initiates.  
• Company Representative to advise the Chief Executive of dam failure as soon as reasonably possible after those who are likely to be affected are notified. |
<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Developing flood in the dam catchment</th>
<th>Actions and notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
</table>
| STAND-DOWN         | Flood levels receding with lake levels dropping back towards normal operating level (375.8m AHD) and dam releases are unlikely to impact on PAR and downstream infrastructure. | • Company Representative in conjunction with LDMG to issue **Advice Notification** to previously notified entities and PAR advising the end of the dam hazard event or emergency event  
• Company Representative and Dam Engineer to prepare Emergency Event Report (EER) and submit to the Chief Executive within 30 business days after the end of the emergency event. |
### 8.2 Structural Concerns / Sunny day Failure

#### Table 2: Sunny day failure and seepage events notification and actions

<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALERT</td>
<td>Identification during routine inspection of initial signs of embankment distress such as cracks. Identification of new areas of seepage or increase in existing seepage.</td>
<td>• Dam Engineer to travel to Lake Mitchell Dam and meet with Company Site Supervisor/Operator. Proceed to dam and undertake condition assessment&lt;br&gt;• Assess situation on site and contact Company Representative by telephone&lt;br&gt;• <strong>Company Representative to provide Advice Notification to the LDMG</strong>&lt;br&gt;• <strong>Site Supervisor to phone PAR and follow up by door-knocking if safe to do so</strong> (The intent of the message is to advise PAR that there is no immediate danger however, they should keep themselves up-to-date with developments)&lt;br&gt;• Site Supervisor to continue monitoring the issue.&lt;br&gt;• On advice of the Company’s Dam Engineer, upgrade efforts at remedial works or load reduction if practical.&lt;br&gt;• <strong>Preliminary Warning Watch and Act:</strong>&lt;br&gt;  o Update notifications to those who received previous notifications. Inform them of any downstream infrastructure that may be impacted by a dam failure.&lt;br&gt;  o The message to the PAR should convey that it is likely that they will be impacted by the emergency. That they will be in danger and should start taking action to protect lives.&lt;br&gt;  o Updates, to be provided every 4 hours, but may need to be more frequent when deemed appropriate.</td>
</tr>
<tr>
<td>LEAN FORWARD</td>
<td>Cracking becoming more significant to the point where dam stability may be starting to be impaired. Detection of signs of cloudy water.</td>
<td></td>
</tr>
</tbody>
</table>

Lake Mitchell Dam Emergency Action Plan - July 2020
<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
</table>
| STAND-UP           | Increasing in cracking to a state where the safety of the dam is significantly impaired.  
                     Increasing seepage discharge rate and clouding. Piping failure has initiated.  
                     Progressive internal erosion of the embankment or foundation to form an open conduit or a pipe and the dam failure is likely. |  
                     • Company staff to continue dam inspections, monitoring and recording of water level of the dam at more frequent intervals if safe to do so.  
                     • Request LDMG to issue emergency alert to PAR to evacuate to high ground to avoid any impending flood / dam failure flows.  
                     • Company Representative to issue more frequent notifications to all relevant entities including the LDMG and Chief Executive. Updates to be provided at least every few hours but also when ‘benchmark’ lake levels or discharge are being reached.  
                     • Company Representative to issue more frequent notifications to all relevant entities including LDMG and Chief Executive.  
                     • Updates to be provided at least every 2 hours or more frequently when deemed appropriate.  
                     • **Warning message:**  
                       o Prepare to take action notifications to all relevant entities and PAR  
                     • **Emergency Warning:**  
                       o Request LDMG to issue an emergency alert (EA) for Maryfarms area for sunny day failure situation. The text of such a request is shown in Appendix 3.  
                       o Take immediate action notifications to all relevant entities, PAR and the wider community.  
                     • Immediately notify LDMG and other relevant entities if present when the dam failure initiates or as soon as possible thereafter.  
                     • Advise the Chief Executive of dam failure as soon as reasonably possible after those who are likely to be affected are notified.  

### Emergency triggers | Characteristics | Notifications (as agreed with Mareeba Local Disaster Management Group)
--- | --- | ---
| **STAND-DOWN** | Remedial works completed and there is no risk of failure or it is determined that the issue is manageable and is not going to develop into a failure condition. Failure occurs and the reservoir drains. | • Issue **Advice Notification** advising the end of the dam hazard event or emergency event to previously notified entities and PAR  
• Complete the remedial works and confirm that there is no risk of dam failure.  
• Prepare Emergency Event Report (EER) and submit to Chief Executive, DNRME within 30 business days after the end of the emergency event. |

### 8.3 Dam Failure as a Result of Earthquake

**Table 3: Dam failure as a result of earthquake: notification and actions**

Lake Mitchell Dam is constructed in an area that has been tectonically stable for billions of years. The probability of earthquake is considered to be very low. The notifications and actions resulting from failure of Lake Mitchell Dam as a result of earthquake are very similar to those for sunny day failure.

| Emergency triggers | Characteristics | Notifications (as agreed with Mareeba Local Disaster Management Group) |
--- | --- | ---
| **ALERT** | Development of embankment distress such as cracks.  
New areas of seepage or increase in existing seepage.  
Development of signs of change in dam profile, foundation movement or displacement immediately adjacent to the dam.  
Development of cracks or scarps near the crest and changes in profile around the toe indicating downstream slide.  
Evidence of material displacement around | • Immediately after the earthquake the Company’s Dam Engineer and Site Supervisor shall inspect the dam if safe to do so.  
• **Company Representative to issue Advice Notification** to Local Disaster Management Group (LDMG) and the Chief Executive alerting them to the situation.  
• **Site Supervisor to phone PAR and follow up by door-knocking if safe to do so.** (The intent of the message is to advise PAR that there is no immediate danger however, they should keep themselves up-to-date with developments)Company Dam engineer to arrange for emergency repair if appropriate |
<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEAN FORWARD</strong></td>
<td>Evidence of embankment failure becoming more significant to the point where dam stability may be starting to be impaired. Detection of signs of cloudy water.</td>
<td>• Company’s Dam Engineer and Site Supervisor to continue monitoring the issue.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• On advice of the Dam Engineer upgrade efforts at remedial works or load reduction if practical.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Preliminary Warning Watch and Act:</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Update notifications to those who received previous notifications. Inform them of any downstream infrastructure that may be impacted by a dam failure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o The message to the PAR should convey that it is likely that they will be impacted by the emergency. That they will be in danger and should start taking action to protect lives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Updates, to be provided every 4 hours, but may need to be more frequent when deemed appropriate.</td>
</tr>
<tr>
<td><strong>STAND-UP</strong></td>
<td>Evidence of embankment failure to a state where the safety of the dam is significantly impaired. Increasing seepage discharge rate and clouding. Piping failure has initiated. Progressive internal erosion of the embankment or foundation to form an open conduit or a pipe and the dam failure is likely. Failure occurs and the reservoir drains.</td>
<td>• Site Supervisor to continue monitoring the condition of the dam and the issue if safe to do so and advise Company’s Dam Engineer on latest visual condition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Continue remedial work or load reduction if safe to do so.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Evacuate to the high ground if dam failure is anticipated.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• More frequent notifications to all relevant entities including LDMG and Chief Executive. Updates to be provided at least every 2 hours or more frequently when deemed appropriate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>**Site Supervisor to phone PAR and follow up by door-knocking if safe to do so (The intent of the message is to advise PAR that there</td>
</tr>
</tbody>
</table>
## Emergency triggers

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STAND-DOWN</strong></td>
<td>Remedial works completed and there is no risk of failure or it is determined that the issue is manageable and is not going to develop into a failure condition.</td>
</tr>
</tbody>
</table>

- **Warning message:** Prepare to take action notifications to all relevant entities and PAR
- **Emergency Warning:**
  - Request LDMG to issue an emergency alert (EA) for Maryfarms area for sunny day failure situation. The text of such a request is shown in Appendix 4.
  - Take immediate action notifications to all relevant entities, PAR and the wider community.
  - Immediately notify LDMG and other relevant entities when the dam failure initiates.
  - Advise the Chief Executive of dam failure as soon as reasonably possible after those who are likely to be affected are notified.

- **Issue Advice Notification** advising the end of the dam hazard event or emergency event to previously notified entities and PAR
- Complete the remedial works and confirm that there is no risk of dam failure.
- Prepare Emergency Event Report (EER) and submit to Chief Executive, DNRME within 30 business days after the end of the emergency event.
8.4 Dam Failure as a Result of Terrorism, Vandalism or High Energy Impact

**IF LAKE MITCHELL DAM IS BREACHED AS A RESULT OF AN EXPLOSIVE CHARGE NOTIFICATIONS SHOULD IMMEDIATELY PROCEED TO THE STAND UP PHASE.**

**Table 4: Dam failure as a result of terrorism, vandalism or high energy impact: notification and actions**

The notifications and actions resulting from failure of Lake Mitchell Dam as a result of vandalism, terrorism or high energy impact are very similar to those for dam failure as a result of earthquake, with the exception that Queensland Police Service may be the primary response agency.

<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
</table>
| ALERT              | Evidence of imminent dam failure as a result of vandalism or physical sabotage such as:  
  - Development of embankment distress such as cracks.  
  - New areas of seepage or increase in existing seepage.  
  - Signs of change in dam profile, foundation movement or displacement immediately adjacent to the dam.  
  - Development of cracks or scarps near the crest and changes in profile around the toe indicating downstream slide.  
  - Evidence of material displacement around the rim of the storage.  
  - Evidence of material displacement from the hill slopes and valley walls around the storage.  
  - Evidence of movement or cracking in structural concrete at outlet structure | • Immediately after the terrorism act, vandalism or high energy impact the Site Supervisor/Operator will notify the Queensland Police Service, (QPS), Mareeba or call 000.  
• Site Supervisor will notify the Company Representative.  
• Company Representative will report the incident to National Security Hotline by calling 1800 123 400.  
• The Company's Dam Engineer and Site Supervisor shall inspect the dam if safe and permitted to do so by QPS.  
• **Advice Notification** to Local Disaster management group (LDMG), PAR and the Chief Executive alerting them to the situation. The intent of the message is to advise PAR that there is no immediate danger however; they should keep themselves up-to-date with developments.  
• **Site Supervisor to phone PAR and follow up by door-knocking if safe to do so** (The intent of the message is to advise PAR that there is no immediate danger however, they should keep themselves up-to-date with developments)  
• Dam Engineer to arrange for emergency repairs, if appropriate and approved by QPS.  
• Company staff to photograph damage or incident site if approved by QPS. |
LEAN FORWARD

Evidence of embankment failure becoming more significant to the point where dam stability may be starting to be impaired. Detection of signs of cloudy water.

STAND-UP

Dam breached as a result of explosion. Evidence of embankment failure to a state where the safety of the dam is significantly impaired. Increasing seepage discharge rate and clouding. Piping failure has initiated. Progressive internal erosion of the embankment or foundation to form an open conduit or a pipe and the dam failure is likely. Failure occurs and the reservoir drains.

<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
</table>
| LEAN FORWARD       | Evidence of embankment failure becoming more significant to the point where dam stability may be starting to be impaired. Detection of signs of cloudy water. | • Company staff to record details of any unusual vehicles including registration, description, time, date etc.  
 • Dam Engineer and Site Supervisor to continue monitoring the issue if approved by QPS.  
 • On advice of the Dam Engineer, upgrade efforts at remedial works or load reduction if practical.  
 Preliminary Warning Watch and Act:  
 • Site Supervisor to phone PAR and follow up by door-knocking if safe to do so (The intent of the message is to advise PAR that there is no immediate danger however, they should keep themselves up-to-date with developments). Inform them of any downstream infrastructure that may be impacted by a dam failure.  
 • Updates, to be provided every 4 hours, but may need to be more frequent when deemed appropriate. |
| STAND-UP           | Dam breached as a result of explosion. Evidence of embankment failure to a state where the safety of the dam is significantly impaired. Increasing seepage discharge rate and clouding. Piping failure has initiated. Progressive internal erosion of the embankment or foundation to form an open conduit or a pipe and the dam failure is likely. Failure occurs and the reservoir drains. | • If dam has been breached QPS should be notified.  
 • Site Supervisor and Dam Engineer to continue monitoring the condition of the dam if approved by QPS. Continue remedial work or load reduction if safe to do so.  
 • PAR to be requested to evacuate to the high ground if dam already breached.  
 • More frequent notifications to all relevant entities including LDMG and Chief Executive. Updates to be provided at least every 2 hours or more frequently when deemed appropriate.  
 • Warning message:  
    o Prepare to take action notifications to all relevant entities and PAR |
<table>
<thead>
<tr>
<th>Emergency triggers</th>
<th>Characteristics</th>
<th>Notifications (as agreed with Mareeba Local Disaster Management Group)</th>
</tr>
</thead>
</table>
| STAND-DOWN         | Remedial works completed and there is no risk of failure or it is determined that the issue is manageable and is not going to develop into a failure condition. | • Emergency Warning:  
  o Request LDMG to issue an emergency alert (EA) for Maryfarms area for sunny day failure situation. The text of such a request is shown in Appendix 4.  
  o Take immediate action notifications to all relevant entities, PAR and the wider community.  
  • Immediately notify LDMG and other relevant entities when the dam failure initiates.  
  • Advise the Chief Executive of dam failure as soon as reasonably possible after those who are likely to be affected are notified.  
  • Issue Advice Notification advising the end of the dam hazard event or emergency event to previously notified entities and PAR  
  • Complete the remedial works and confirm that there is no risk of dam failure.  
  • Prepare Emergency Event Report (EER) and submit to Chief Executive within 30 business days after the end of the emergency event. |
9.0 POST EMERGENCY ACTIONS

After an extreme rainfall and flooding event, the Company’s Dam Engineer will inspect the condition of the dam and notify the following of the outcome of that inspection.

- The Dam Owner Representative
- Director Dam Safety (or his representative), Queensland Water Supply Regulator, Department of Natural Resources Mines and Energy, Brisbane – 1300 596 709
- Chief Executive Officer, Mareeba Shire Council – 1300 30 8461;
- Local Disaster Co-ordinator, LDMG, Mareeba – 1300 30 8461; and
- Bureau of Meteorology Land, Weather and Flood Warnings 1300 659 219 (email www.bom.gov.au)

9.1 Emergency Event Reporting

The Dam Owner will prepare an emergency event report (EER) and submit it to the Chief Executive of DNRME within 30 business days of the conclusion of an emergency event which has resulted in the activation of the EAP, where:

a) a person or property has been or may have been harmed because of the event; and
b) any of the following applies:
   (i) a coordinated response involving two or more relevant entities has been initiated;
   (ii) an event arose because of disaster situation declared under the Disaster Management Act;
   (iii) an entity performing functions under the State Disaster Management Plan, requires the Dam Owner to provide information about the event,

The emergency event ends when the dam hazard that triggered the event no longer presents a material risk to persons or property.

The EER will provide a timeline of events, including monitoring and inspection data (rainfall, storage level, seepage and etc), which were used to make EAP activation decisions. The EER will also outline responsibilities associated with emergency communications between the Dam Owner, Governments (local and state), disaster management groups (local and district) and the PAR and the wider community (if relevant). The EER will include photographs of the event.
10.0 CONDITION REPORTING

The Queensland Dam Safety Management Guidelines provide a list of emergency situations and actions that should be considered when identifying problems that may endanger the integrity of a dam.

An inspection and monitoring program is in place as required by the dam safety guidelines. That program is as follows.

- Routine inspections – these are visual inspections made regularly by the Company’s Site Supervisor/Operator during day to day visits to the dam. This ensures that any problems of movement or seepage or other pressures or degradation that might be appearing are identified at an early date.

- Periodic inspections – these inspections are undertaken by an experienced engineer (RPEQ) for the purpose of identifying any physical deficiencies in the dam by visual examination and to review knowledge and information from the routine inspections. These inspections provide the opportunity to identify any adverse trends in the condition of the dams and to make recommendations on any action that might be required to ensure the continued safety of the dam.

- Special inspections – these inspections are be undertaken by an RPEQ if some particular feature or operational aspect of the dam is of concern; e.g. after flood damage from a major rainfall event or foundation problem or unsafe condition is identified.

Lake Mitchell Dam has been the subject of ongoing inspections by RPEQ, an engineer experienced with dam construction and operation.

It should be noted that both flooding scenarios and developing scenarios could occur at the same time.

Actions detailed in this EAP must only be undertaken if it is safe to do so.
## 10.1 INTEGRATION WITH LOCAL DISASTER MANAGEMENT PLANNING

Table 7 shows the functions of a local disaster management group and how the EAP is envisaged to integrate with those functions.

### TABLE 7: FUNCTIONS OF A LDMG AND INTEGRATION WITH THE EAP

<table>
<thead>
<tr>
<th></th>
<th>Functions of a local disaster management group and how the EAP is envisaged to integrate with those functions.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ensure that disaster management and disaster operations in the area are consistent with the State group’s strategic policy framework for disaster management for the State;</td>
<td>EAP is expected to fit with strategic policy framework for disaster management</td>
</tr>
<tr>
<td>2.</td>
<td>Develop effective disaster management, and regularly review and assess the disaster management;</td>
<td>EAP provides a framework for identification of a potential flooding emergency, contact mechanisms for persons who may be affected, feedback and reporting</td>
</tr>
<tr>
<td>3.</td>
<td>Help the local government for its area to prepare a local disaster management plan;</td>
<td>EAP will assist Mareeba Shire Council in its local disaster management plan</td>
</tr>
<tr>
<td>4.</td>
<td>Identify, and provide advice to the relevant district group about, support services required by the local group to facilitate disaster management and disaster operations in the area;</td>
<td>EAP provides a framework for identification of a potential flooding emergency, contact mechanisms for persons who may be affected, feedback and reporting</td>
</tr>
<tr>
<td>5.</td>
<td>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;</td>
<td>Dam Owner will comply with any guidelines from LDMG to assist mitigation</td>
</tr>
<tr>
<td>6.</td>
<td>Manage disaster operations in the area under policies and procedures decided by the State group;</td>
<td>EAP will assist in this function</td>
</tr>
<tr>
<td>7.</td>
<td>Provide reports and make recommendations to the relevant district group about matters relating to disaster to identify, and coordinate the use of, resources that may be used for disaster operations in the area;</td>
<td>Dam Owner will provide any reasonable documentation to assist with LDMG reporting and recommendations</td>
</tr>
</tbody>
</table>
TABLE 7: FUNCTIONS OF A LDMG AND INTEGRATION WITH THE EAP

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Establish and review communications systems in the group, and with the relevant district group and other local groups in the disaster district of the relevant district group, for use when a disaster happens;</td>
<td>EAP provides guidance on communications in the event of a flooding emergency as a result of Lake Mitchell</td>
</tr>
<tr>
<td>9</td>
<td>Ensure information about a disaster in the area is promptly given to the relevant district group; EAP provides a framework for identification of a potential flooding emergency, contact mechanisms for persons who may be affected, feedback and reporting</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Perform other functions given to the group under this Act or functions incidental to a function mentioned.</td>
<td>LDMG function</td>
</tr>
</tbody>
</table>

The Chairperson of the Mareeba LDMG has endorsed this EAP and has advised that the Mareeba LDMG will accept responsibility for those aspects of the EAP in which it is assigned actions.

11.0 UPDATING THE EMERGENCY ACTION PLAN

The Emergency Action Plan will be reviewed for adequacy every five years as part of the comprehensive 5 yearly inspection.

The Notification – Contact Information set out in Table 3 will be updated annually or as required.

Telephone contact details will be updated with changes to State and Local Government contact details.

Following updating, the plan will be distributed as per the Distribution Control Sheet.
APPENDIX 1: SPILLWAY DISCHARGE DERIVATION and FLOOD HYDROGRAPHS

The table below shows the discharges calculated for Spillway A (Neville Jones and Associates, 1985) and Spillway B (revised for this EA. Figure 4 shows the discharge rating curves from these data.

<table>
<thead>
<tr>
<th>Storage Level (m AHD)</th>
<th>Spillway A (cumecs)</th>
<th>Spillway B (cumecs)</th>
<th>Combined Discharge (cumecs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>376.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>376.8</td>
<td>31.5</td>
<td>31.5</td>
<td>63</td>
</tr>
<tr>
<td>377</td>
<td>89</td>
<td>89</td>
<td>178</td>
</tr>
<tr>
<td>377.2</td>
<td>163.6</td>
<td>163.6</td>
<td>327</td>
</tr>
<tr>
<td>377.4</td>
<td>252</td>
<td>252</td>
<td>504</td>
</tr>
<tr>
<td>377.6</td>
<td>352</td>
<td>7</td>
<td>369</td>
</tr>
<tr>
<td>377.8</td>
<td>463</td>
<td>42</td>
<td>505</td>
</tr>
<tr>
<td>378</td>
<td>583</td>
<td>98</td>
<td>681</td>
</tr>
<tr>
<td>378.2</td>
<td>712</td>
<td>171</td>
<td>883</td>
</tr>
<tr>
<td>378.4</td>
<td>850</td>
<td>260</td>
<td>1110</td>
</tr>
<tr>
<td>378.6</td>
<td>995</td>
<td>362</td>
<td>1357</td>
</tr>
<tr>
<td>378.8</td>
<td>1149</td>
<td>479</td>
<td>1628</td>
</tr>
<tr>
<td>379</td>
<td>1309</td>
<td>607</td>
<td>1916</td>
</tr>
<tr>
<td>379.2</td>
<td>1476</td>
<td>748</td>
<td>2224</td>
</tr>
<tr>
<td>379.4</td>
<td>1649</td>
<td>900</td>
<td>2549</td>
</tr>
<tr>
<td>379.6</td>
<td>1830</td>
<td>1063</td>
<td>2893</td>
</tr>
<tr>
<td>379.8</td>
<td>2015</td>
<td>1237</td>
<td>3252</td>
</tr>
</tbody>
</table>

The figure below shows these results graphically.
Figure 1: Spillway Rating Curves

Figure 2: Flood Hydrograph for Sunny Day Failure
Figure 3: Flood Hydrograph for Flood Failure
APPENDIX 2: MODELLED FLOOD FAILURE IMAGES

Flood Failure Inundation Depths at “Font Hill”

Flood Failure Inundation Depths at Maryfarms
Flood Plume 6 hours after embankment failure

Flood Plume 12 hours after embankment failure
Flood Plume 18 hours after embankment failure

Flood Plume 24 hours after embankment failure
Flood Plume 30 hours after embankment failure

Flood Plume 36 hours after embankment failure
Flood Plume 48 hours after embankment failure
INUNDATED AREA

APPENDIX 3: LIMITATIONS OF ACCURACY OF FLOOD FORECASTS

The attached summary of the dam break inundation modelling for the Mitchell River downstream of Lake Mitchell outlines the limitations on accuracy of the inundation estimates.

Any flood modelling depends on a dataset that represents the terrain. The underlying terrain dataset used as a basis for the model geometry was the SRTM-derived, hydrologically enforced, 1-arc second digital elevation model provided by Geoscience Australia's Elevation Information System (ELVIS). The resolution of the terrain data is approximately 30 metres by 30 metres.

The modelling included two dam break hydrographs:
- Sunny day with a peak discharge of 2,891 m³/s; and
- Flood failure with a peak discharge of 12,749 m³/s

Results were assessed in two locations that are or could be inhabited:
- Font Hill, approximately 16 km downstream of Lake Mitchell
- Maryfarms, approximately 30 km downstream of Lake Mitchell at three sites – Brooklyn, the Peninsula Development Road at Mary Creek and the properties along East and West Maryfarms Roads to the east of the Peninsula Development Road at Mary Creek (East Maryfarms).
The table below shows summary results of the modelling.

<table>
<thead>
<tr>
<th>Location</th>
<th>Sunny Day Max Depth (m)</th>
<th>Sunny Day Max Velocity (m/s)</th>
<th>Max Depth x Velocity (m²/s²)</th>
<th>Dam failure Max Depth (m)</th>
<th>Dam failure Max Velocity (m/s)</th>
<th>Dam failure Max Depth x Velocity (m²/s²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Font Hill</td>
<td>0.1</td>
<td>Dry</td>
<td>3.3</td>
<td>Dry</td>
<td>0.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Brooklyn</td>
<td>0.1</td>
<td>Dry</td>
<td>&lt;0.1</td>
<td>1.7</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Maryfarms Highway</td>
<td>0.1</td>
<td>Dry</td>
<td>0.5</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>East Maryfarms</td>
<td>0.1</td>
<td>Dry</td>
<td>0.2</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
</tbody>
</table>

**Accuracy Limitations**

The available terrain dataset is generally inadequate to accurately portray the Mitchell River’s cross section or to make conclusive recommendations regarding inundation depths, velocities, and arrival times at specific locations. The results presented in the accompanying report are indicative only and should be revisited if more accurate terrain data become available.
# APPENDIX 4: EMERGENCY ALERT REQUESTS TO LDMG

## EMERGENCY ALERT REQUEST

<table>
<thead>
<tr>
<th>Location: LAKE MITCHELL DAM, MULLIGAN HIGHWAY, MOUNT MOLLOY</th>
<th>Date: / /</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time: : hrs</td>
<td></td>
</tr>
</tbody>
</table>

### Requesting Officer:

**Agency/Position:** Company Representative, Southedge Pastoral Company Pty Ltd

**Telephone:**

**Email:**

### Event Type

- [ ] Cyclone
- [ ] Storm Surge
- [ ] Flash Flood
- [ ] Flood
- [ ] Bushfire
- [ ] Fire Incident
- [ ] Smoke or Toxic Plume
- [ ] Chemical Spill
- [ ] Tsunami (NOTE Tsunami EA campaigns will be sent as Location Based Text Message ONLY)
- [ ] Other (please specify): Sunny day dam embankment breach

### Message Severity

- [ ] Emergency Warning (NOTE activates the SEWS)
- [ ] Watch & Act
- [ ] Advice

### Campaign Mode

- [ ] Voice
- [ ] SMS – Location Based
- [ ] SMS – Service Address Based

### LDMG Advised

- [ ] YES
- [ ] NO

### DDMG Advised

- [ ] YES
- [ ] NO

### Threat Direction

- [ ] YES
- [ ] NO

**Note:** Can only be used for Emergency Warnings. Indicate direction on map

---

### STEP 1. EA Polygon Area:

- [ ] Map attached

### STEP 3. Spatial format:

- [ ] KML *.kml (preferred format as per Spatial guidelines)
- [ ] ESRI *.dbf, *.prj, *.shp, *.shx
- [ ] GML *.gml, *.xsd
- [ ] MapInfo TAB *.dat, *.id, *.map, *.tab
- [ ] MapInfo Mid/Mif *. MIDI Sequence, *.mif
- [ ] OTHER (insert)

### STEP 4. Messaging/spatial data, is it supplied via

- [ ] DMportal - specify filenames below
- [ ] FTP - specify filenames below
- [ ] Other (please specify)

### Type (please use capitals for clarity) or handwrite Voice message (Ideally message should be less than 450 characters).

Residents at Brooklyn station and houses on the Mulligan Highway at Maryfarms can expect floodwater inundation to depths of less than half a metre as a result of dam embankment failure. Flood water will take about 36 hours to reach Maryfarms after the breach which occurred at [time of breach]. Therefore, you should make preparations to move to high ground to the east of Maryfarms.

### Type or handwrite SMS below (maximum of 160 characters including spaces)

The dam wall at Lake Mitchell failed at [time of breach]. Flood water up to 0.5m deep will reach your property after 36 hours. Make preparations to move to high ground to the east of Maryfarms.

SEND TO sdcc@qfes.qld.gov.au and call **07 36352387** TO CONFIRM
**EMERGENCY ALERT REQUEST**

**Location:** LAKE MITCHELL DAM, MULLIGAN HIGHWAY, MOUNT MOLLOY

**Date:** / /  
**Time:** : hrs

**Requesting Officer:**  
**Agency/Position:** Company Representative, Southedge Pastoral Company Pty Ltd

**Event Type**

- Cyclone
- Storm Surge
- Flash Flood
- Flood
- Bushfire
- Fire Incident
- Smoke or Toxic Plume
- Chemical Spill
- Tsunami (NOTE Tsunami EA campaigns will be sent as Location Based Text Message ONLY)
- Other (please specify): Sunny day dam embankment breach

**Message Severity**

- Emergency Warning (NOTE activates the SEWS)
- Watch & Act
- Advice

**Campaign Mode**

- Voice
- SMS – Location Based
- SMS – Service Address Based

**LDMG Advised**

- YES
- NO

**DDMG Advised**

- YES
- NO

**Threat Direction Required?**

- YES
- NO

**Note:** Can only be used for Emergency Warnings. Indicate direction on map

**STEP 1. EA Polygon Area:**  
- Map attached

**STEP 3. Spatial format:** (Indicate the format used)

- KML *.kml (preferred format as per Spatial guidelines)
- ESRI *.dbf, *.prj, *.shp, *.shx
- GML *.gml, *.xsd
- MapInfo TAB *.dat, *.id, *.map, *.tab
- MapInfo Mid/Mif *. MIDI Sequence, *.mif
- OTHER (insert)

**STEP 2. Filename:**

**STEP 4. Messaging/spatial data, is it supplied via**

- DMportal - specify filenames below
- FTP - specify filenames below
- Other (please specify)

**Type (please use capitals for clarity) or handwrite Voice message (Ideally message should be less than 450 characters).**

Residents at Brooklyn station and in the Maryfarms area can expect floodwater inundation to depths of up to 3.3 metres as a result of dam embankment failure associated with the current extreme rainfall. Flood water will take about 36 hours to reach Maryfarms after the breach which occurred at (time of breach). Therefore, you should make preparations to move to high ground to the east of Maryfarms.

**Type or handwrite SMS below (maximum of 160 characters including spaces)**

The dam wall at Lake Mitchell failed at (time of breach). Flood water up to 3.3m deep will reach your property after 36 hours. Make preparations to move to high ground to the east of Maryfarms.

**SEND TO sdcc@qpes.qld.gov.au and call 07 36352387 TO CONFIRM**