Rifle Creek Dam
EMERGENCY ACTION PLAN

Mount Isa Mines
September 2020

Approved by the delegate of the Chief Executive, Department of Natural Resources, Mines and Energy until 1 August 2022.
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Emergency Activation Quick Reference - Dam Hazards

The Emergency Action Plan (EAP) for Rifle Creek Dam covers five dam hazards evaluated within Glencore Mount Isa Mines management plan. Use the following table to select the relevant section of the EAP that deals with the dam hazard.

<table>
<thead>
<tr>
<th>Dam hazards and sections numbers</th>
<th>Activation Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alert</td>
</tr>
<tr>
<td>Flood Operations</td>
<td></td>
</tr>
<tr>
<td>See Section 4.3 PAGE 18</td>
<td>Water level is &lt;= 0.9m above spillway level.</td>
</tr>
<tr>
<td>Structural Damage: Landslide, Foundation, Abutments, or cracking</td>
<td>Increased seepage through an embankment, the foundations, or abutments</td>
</tr>
<tr>
<td>See Section 4.4 PAGE 20</td>
<td></td>
</tr>
<tr>
<td>Structural Damage: Earthquake</td>
<td>Increased seepage through an embankment, the foundations, or abutments</td>
</tr>
<tr>
<td>See Section 4.4 PAGE 20</td>
<td></td>
</tr>
<tr>
<td>Contamination of Dam Water Supply</td>
<td>Identification of possible contaminant in the water storage area.</td>
</tr>
<tr>
<td>See Section 4.5 PAGE 22</td>
<td></td>
</tr>
<tr>
<td>Terrorist Threat/Security Threat</td>
<td>Suspicious behaviour at the dam or surrounding area.</td>
</tr>
<tr>
<td>See Section 4.6 PAGE 23</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Author/Reviewer</td>
<td>Name:</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>MIM Water Distribution Superintendent</td>
<td>Name:</td>
</tr>
<tr>
<td>(Reviewer)</td>
<td></td>
</tr>
<tr>
<td>Owner MIM</td>
<td>Name:</td>
</tr>
<tr>
<td>Isa Processing General Manager</td>
<td></td>
</tr>
<tr>
<td>Mount Isa City Council Chief Executive</td>
<td>Name:</td>
</tr>
<tr>
<td>Officer</td>
<td></td>
</tr>
<tr>
<td>District Disaster Management Group</td>
<td>Name:</td>
</tr>
<tr>
<td>Executive Officer</td>
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Rifle Creek Dam EAP Review Sheet

Version Number 17, September 2020 | 5
### Controlled Copy List

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<th>Copy Number</th>
<th>Position (Name)</th>
<th>Location</th>
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<tr>
<td>1</td>
<td>Glencore Mount Isa Mines Limited (GMIM) Isa Processing General Manager</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>2</td>
<td>Water Distribution Superintendent</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>3</td>
<td>Rifle Creek Dam Caretaker</td>
<td>Rifle Creek Dam</td>
</tr>
<tr>
<td>4/5</td>
<td>GMIM Representatives on Mount Isa LDMG</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>6</td>
<td>Director Dam Safety Water Planning and Regulation (DNRME)</td>
<td>Brisbane</td>
</tr>
<tr>
<td>7</td>
<td>Mount Isa City Council Chief Executive Officer</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>8</td>
<td>MOUNT ISA LDMG Chief Executive Officer</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>9</td>
<td>Mount Isa Mines Crisis Room (SRRT) 1st Floor, Met Plant Building</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>10</td>
<td>DDMG Executive Officer Mount Isa District</td>
<td>Mount Isa</td>
</tr>
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# Document Control Details

**Controlled Copy Number:** 1  
**Revision Status:** Original Copy

<table>
<thead>
<tr>
<th>Revision Number</th>
<th>Revision Description</th>
<th>Revision Date</th>
<th>Authorisation Signature</th>
</tr>
</thead>
</table>
| 1               | MOMM - Change of email address  
DNR&M - Change of contact name                                                      | 12-Sept-02    |                          |
| 2               | DDC - New controlled copy  
DNR&M - Change of contact name  
MICC - New controlled copy                                                              | 03-Dec-02     |                          |
| 3               | DNRM&E - Change of contact name  
- Change business name / initials  
ES - Change of contact name  
Maunsell - Change of contact name  
MICC - Change of contact name  
SES - Change of phone numbers  
SSM - Change of contact name  
SSM - Change of title  
WS - Change of contact name                                           | 21-Sept-04    |                          |
| 4               | Notification List updated                                                               | 30-Jun-07     |                          |
| 5               | Notification List updated                                                               | 31-July-08    |                          |
| 6               | Department name change to Utilities  
UM - Change of contact name  
Incorporate recommendations from 2009 Comprehensive Inspection  
DEWS - Change of Business Name                                                    | 30-May-09     |                          |
| 7               | Maunsell - Contact removed from copy list  
ES - Contact removed from copy list  
DNRM - Contact removed from copy list                                                | 20-May-10     |                          |
<p>| 8               | GMIM Utilities Manager - Change of contact name and details                               | 09-May-11     |                          |
| 9               | Mica Creek Power Station - Change of owners and manager                                 | 14-May-12     |                          |
| 10              | Updated EAP &amp; QLD flood commission of inquiry recommendations from review by dated 26/07/2012 | 14-May-13     |                          |</p>
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<thead>
<tr>
<th>Revision Number</th>
<th>Revision Description</th>
<th>Revision Date</th>
<th>Authorisation Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Updated EAP with name change on company from Xstrata Mount Isa Mines to Glencore Mount Isa Mines and XMIM to GMIM Department name change to Central Engineering- CEM – Central Engineering General Manager Email addresses changed for all GMIM personnel</td>
<td>12-May-14</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
<tr>
<td>12</td>
<td>General Update of Document</td>
<td>05-Aug-15</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
<tr>
<td>13</td>
<td>General updates throughout document</td>
<td>29 June 16</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
<tr>
<td>14</td>
<td>General updates throughout document</td>
<td>16-Aug-17</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
<tr>
<td>15</td>
<td>General updates throughout document Change of name from DEWS to DNRME Submission date change Address some schedule of matters</td>
<td>24-July-18</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
<tr>
<td>16</td>
<td>General updates throughout document Updated flood mapping Updated notification list to include residents at Carbeen Park</td>
<td>15-June-19</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
<tr>
<td>17</td>
<td>General updates throughout document</td>
<td>20-July-20</td>
<td>GMIM Water Distribution Superintendent</td>
</tr>
</tbody>
</table>
1 Procedural Flow Chart and Notification List

1.1 Procedural Flow Chart

[Diagram with decision points and notifications]

Legend:
- 4.X.X – Procedure as detailed in Section 4
- 20kRes – Key contacts on properties within 20km downstream of the dam, including Mica Creek Power Station
- IPGM – Glencore Mount Isa Mines Isa Processing General Manager
- DNRME – Director of Dam Safety, DNRME
- EER – Emergency Event Report
- MOUNT ISA LDMG – Chairman of the Local Disaster Management Group

Abnormal condition or significant discharge identified

Risk of structural failure?

Is dam spilling?

Risk of contamination

Terrorism/Security Threat

Event receding?

IPGM to notify
- MOUNT ISA
- LDMG
- GMIMSC

Continue to monitor and issue updates every 24hrs

IPGM to notify
- Emergency Services
- MOUNT ISA
- GMIMSC
- DNRME

4.6.2

Legend

ALERT

LEAN FORWARD

STAND UP

EMERGENCY RESPONSE
IPGM to notify
- Emergency Services
- MOUNT ISA LDMG
- GMIMSC
- 20kRes
- DNRME

MOUNT ISA LDMG to notify other parties and coordinate Emergency Response as appropriate

All issues managed?

Yes

No

Yes

No

Yes

No

No
# 2 Basic Details of Dam

## 2.1 General Dam Information

<table>
<thead>
<tr>
<th><strong>Location</strong></th>
<th>Rifle Creek, 28km SSE of Mt Isa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Latitude 20°57'20&quot;S</td>
</tr>
<tr>
<td></td>
<td>Longitude 139°35'20&quot;E</td>
</tr>
<tr>
<td><strong>Construction Type</strong></td>
<td>Mass concrete gravity/arch dam</td>
</tr>
<tr>
<td><strong>Construction Date</strong></td>
<td>1929 (upgraded 1950, 2015)</td>
</tr>
<tr>
<td><strong>Owner</strong></td>
<td>Mount Isa Mines</td>
</tr>
<tr>
<td><strong>Dam Length</strong></td>
<td>125m</td>
</tr>
<tr>
<td><strong>Spillway / gates</strong></td>
<td>Central slot spillway, 59m x 1.25m no gates</td>
</tr>
<tr>
<td><strong>Height above stream bed</strong></td>
<td>18m</td>
</tr>
<tr>
<td><strong>Storage Capacity</strong></td>
<td>9,500 ML</td>
</tr>
<tr>
<td><strong>Full Supply Level (FSL)</strong></td>
<td>3503.40m (GMIM datum)</td>
</tr>
<tr>
<td><strong>Dam Crest Level</strong></td>
<td>3504.65m (GMIM datum)</td>
</tr>
<tr>
<td><strong>Catchment Area</strong></td>
<td>88km²</td>
</tr>
<tr>
<td><strong>Surface area at FSL</strong></td>
<td>1.5km²</td>
</tr>
<tr>
<td><strong>Supply</strong></td>
<td>One of two cooling water supplies to Mica Creek Power Station and Diamantina Power Station (second point of supply available from Leichardt River Dam). Also stock watering supply to downstream properties.</td>
</tr>
<tr>
<td><strong>Spillway capacity</strong></td>
<td>1:30 AEP flood event 3504.65m (GMIM datum) upstream water level 140 m³/s discharge flowrate</td>
</tr>
<tr>
<td><strong>PMF design event</strong></td>
<td>1:10,000,000 AEP flood event 3508.86m (GMIM datum) upstream water level 2905 m³/s discharge flowrate</td>
</tr>
<tr>
<td><strong>Outlet description</strong></td>
<td>Intake tower on the right abutment, with 2-12” cast iron outlet pipes, valve at base of wall. 18” scour pipe, not in use and assumed un-serviceable.</td>
</tr>
</tbody>
</table>
2.2 Population at risk

Rifle Creek Dam is assessed to be rated as a ‘High A’ Hazard Category dam by Queensland dam guidelines (Ref: Guidelines for Failure Impact Assessment of Water Dams, Guidelines for Failure Impact Assessment of Water Dams), based on an incremental Population at Risk (PAR) of 698 with ‘Medium’ severity of damage and loss. The Acceptable Flood Capacity (AFC) fall-back alternative for Rifle Creek Dam is the Probable Maximum Precipitation Design Flood (PMPDF) which has an Annual Exceedance Probability (AEP) of 1:10,000,000.

Whilst Rifle Creek Dam is assessed as a ‘High A’ Hazard Category dam due to the PAR and severity of damage and loss by Queensland dam guidelines, it is assessed to have a consequence category of “Significant” from an analysis of the PAR figures in terms of incremental Potential Loss of Life (PLL) for the worst case dam failure scenario by ANCOLD guidelines (Ref: ANCOLD 2012 – Guidelines on the Consequence Categories of Dams).

3 Purpose Scope Responsibilities

3.1 Purpose

The purpose of an Emergency Action Plan is to pre-plan the coordination of necessary actions by Glencore Mount Isa Mines Limited (GMIM) and to provide timely notification to the Department of Natural Resources, Mines and Energy, Police, Local Disaster Management Groups and affected persons in the event that a condition at Rifle Creek Dam could develop into an emergency.

Having and maintaining an approved Emergency Action Plan for Referable Dams is a legislative requirement under the Water Supply (Safety and Reliability) Act 2008. Specific recommendations for the plan are provided in “Emergency Action Planning for Referable Dams” Department of Natural Resources, Mines and Energy, June 2013.

3.2 Scope

This document applies to Rifle Creek Dam, Mount Isa, and

- identifies emergency conditions which could endanger the integrity of the dam and which require immediate action
- prescribes procedures which are to be followed in the event of an emergency condition developing

3.3 Responsibilities

3.3.1 General

Glencore Mount Isa Mines is the owner and operator of the Rifle Creek Dam. The day to day management of this facility is the responsibility of the Central Engineering Department.

As the dam has no controlled discharge outlets which would be of significance in an emergency event, the primary form of response to emergencies is to provide appropriate and timely notification to people at risk. The Isa Processing General Manager shall be responsible for activation and coordination of the Emergency Action Plan, including assessing the risk in accordance with this plan, providing notifications to affected parties appropriate to the level of impact.
The Isa Processing General Manager shall keep a record of the distribution and location of the Emergency Action Plan. The Manager shall ensure that all copies are current and that duplicate (uncontrolled) copies are not used in the event of an emergency. Records shall be kept of the locations and status of each copy.

The manual shall be reviewed annually by Glencore Mount Isa Mines. Revisions shall be approved by the Isa Processing General Manager and shall include the Document Control Details and the Controlled Copy List. A summary listing of all revisions shall be filed in the revision sheet at the front of the manuals.

Controlled copies shall have a watermark stating ‘Controlled Copy’.

### 3.3.2 Rifle Creek Dam Caretaker, GMIM
- Advise Isa Processing General Manager/Water Distribution Superintendent, GMIM, of an intended absence from the dam
- Follow EAP in time of an emergency
- Monitor and record emergency situation

### 3.3.3 Isa Processing General Manager, GMIM
- Maintain a current notification list
- Ensure Dam Caretaker and the Water Distribution Superintendent is conversant with the EAP
- Review EAP in consultation with the Water Distribution Superintendent at 12 monthly intervals (maximum)
- If during a potential emergency condition the Isa Processing General Manager has not been contacted by the Dam Caretaker, the Isa Processing General Manager shall
  - attempt to contact the Dam Caretaker
  - enact the EAP if the Dam Caretaker cannot be contacted
- Notify the Director of Dam Safety (DNRME) within 48 hours of activation of EAP
- Monitor emergency condition and evaluate situation on best available information
- Monitor weather conditions as appropriate whilst the EAP is activated
- Direct action of Glencore Mount Isa Mines personnel during an emergency event to protect property and life to the maximum extent considered possible under the prevailing conditions and with the resources available
- Provide internal advice and status reports during an emergency event by phone in the timeframe as mentioned in Section 4 Emergency Events and Actions or Appendix H page 82 to:
  - Key contacts on properties within 20km downstream of the dam
  - Mica Creek Power Station and Diamantina Power Station
  - GMIM Water Distribution Superintendent (WD)
  - Mount Isa Mines Security Control (GMIMSC)
  - Local Disaster Management Group
  - Director of Dam Safety (DNRME)
- Once activation level returns to Stand Down, prepare an Emergency Event Report and forward within 30 business days after the end of the emergency event. The Emergency Event Report must contain:
  - a description of the event
- instrumentation readings (where appropriate)
- description of any observed damage
- photographs
- details of communication which took place during the emergency
- comment on the adequacy of the EAP
- any recommendations or suggested changes to the EAP

3.3.4 Water Distribution Superintendent, GMIM

- If during a potential emergency condition the Water Distribution Superintendent has not been contacted by the Isa Processing General Manager, the Water Distribution Superintendent shall:
  - attempt to contact the Isa Processing General Manager
  - enact the EAP if the Isa Processing General Manager cannot be contacted

- On delegation from Isa Processing General Manager at the time of an emergency event, act for and on behalf of the Isa Processing General Manager during the event, including all roles as listed above.

3.3.5 Local Disaster Management Group

The Chairman of the Local Disaster Management Group shall be responsible for assessing the impact of and managing the response to downstream hazards beyond 20km from the dam site, i.e. Refer to attached plan for info below.
4 Emergency Events and Actions

4.1 General

The following events are defined as conditions that could lead to emergency events:

- Any notable flow over the spillway, on the basis that further rainfall could quickly lead to a significant flow event
- Significant flow over spillway (≥0.9m depth of flow over spillway), on the basis that such discharges may contribute to downstream flooding
- Significant flow over spillway (≥1.5m depth of flow over spillway), on the basis that such discharges are likely to contribute to downstream flooding, and further increase may lead to rapid deterioration of the dam integrity
- Earthquake, explosion, landslide or observed structural damage to dam, which could result in dam failure and/or a sudden discharge contributing to downstream flooding
- New area of seepage, significant increase in seepage, or significant unexplained loss of storage contents, which could indicate a potential loss of structural integrity
- Potential contamination of dam water supply, due to object crashing into the dam or toxic waste being dumped into dam water supply
- Terrorism / Security Threat

The Rifle Creek Dam Caretaker undertakes daily visual reviews of the dam and measures dam level, and is likely to be the first person to identify an issue.

Upon identification of any of the above, an activation level of “Alert” shall be recorded. The person identifying the event shall immediately contact the Isa Processing General Manager for direction and to manage the event. The sections below describe what actions should be directly implemented in the event of an emergency.

The IPGM or nominated person (Water Distribution Superintendent), shall notify the Director Dam Safety (DNRME) within 48 hours of activation of the EAP.

4.2 Emergency Access and Communications

Normal dry weather access is via Mount Isa – Duchess Road as shown in Appendix A

- During flood events, access to site is only possible by helicopter for the visual inspection of the dam wall. If evacuation of caretaker is necessary, then the pilot will only land in the vicinity at his discretion for safety, as there is no helipad available.
- Normal communications is by telephone to Caretakers house. A satellite phone is kept at the caretaker residence for emergency communication in the event that normal communications systems fail
- The Isa Processing General Manager shall be responsible for managing the EAP, including notification of affected parties in accordance with the procedures described below and standard messages and notification updates intervals from Appendix H
- Media releases for an emergency event will be issued from the GMIM Site Response Recovery Team (SRRT) through the North Queensland Copper Division (NQCD) Communications Manager
4.3 Significant flow over spillway

Activation level: **ALERT**

Significant flow over the spillway has the potential to pose a flooding risk to assets and persons downstream of the dam, including the Rifle Creek Caretaker’s residence, three private stations, the Mica Creek Power Station and the Mt Isa Township. As the dam overflow is one of several tributaries feeding into these areas, the responsibility of assessing the downstream flooding hazards is the responsibility of the Local Disaster Management Group (Mount Isa LDMG). This EAP is aimed at providing timely information to affected stakeholders and emergency services so as to assist them in assessing the overall hazards and responding accordingly.

The likely causes of a significant flow over the spillway are related to the annual Wet Season and rainfall in the Rifle Creek catchment area. The catchment area is 88km² and is the only source of re-supply for the dam. Whilst there is a potential that the dam may overflow for weeks at a time during the wet season rainfalls, from previous data the dam rarely overflows due to regular water demand and the small catchment area.

From the 2018 Failure Impact Assessment Report, there is a 1:30 Annual Exceedance Probability of a storm event leading to the dam rising from FSL to DCL (0m to 1.25m above spillway level). The theoretical inundation extent relating to such a storm event is shown by the area in black on the Inundation Charts presented in Appendix B, referencing pages 35, 36, 37, 38, 53, 57 and 61.

The 2018 Failure Impact Assessment Report also identified the theoretical inundation extents associated with the Probable Maximum Flood for a 1:10,000,000 Annual Exceedance Probability storm event, as shown by the area in black on the Inundation Charts presented in Appendix B, referencing pages 39, 40, 41, 42, 52, 56 and 60.

**Important Note:** The above inundation estimates relate to storm events in the dam catchment. The effect of rainfall in other catchments feeding into the watercourse must also be taken into consideration, and is outside the scope of this action plan.

4.3.1 Low Flow over Spillway (less than 0.9m depth of flow)

Activation level: **ALERT**

A trigger point of 0.9m above spillway is set as a reference marker that water levels are approaching Dam Crest Level. If flow over the spillway is less than 0.9m then the spillway is well within its design limits, but a significant rainfall event could quickly lead to flooding.

Once the spillway begins overtopping:

**The Rifle Creek Dam Caretaker shall:**
- Visually observe flood levels, record situation, record rainfall and report to the Isa Processing General Manager every 24 hours
- Photograph flows at suitable intervals
- Inspect the dam as soon as safe access is possible after the event

**The Isa Processing General Manager shall:**
- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam levels
- Monitor weather forecasts (minimum every 24 hours)
- Notify Mount Isa LDMG of spillway levels, with updates every 24 hours
• Notify GMIMSC of spillway levels, with updates every 24 hours
• Updates shall continue until water levels begin to recede
• Sample notification messages are presented in Appendix H

4.3.2 Significant Flow over Spillway (0.9m to 1.5m depth of flow and rising)

Activation level: **LEAN FORWARD**

A trigger point of 0.9m above spillway is set as a reference marker that water levels are approaching Dam Crest Level. If flow over the spillway is more than 0.9m and rising then:

**The Rifle Creek Dam Caretaker shall:**

- Visually observe flood levels, record situation, record rainfall and report to the Isa Processing General Manager every eight hours
- Photograph flows at suitable intervals
- Inspect the dam as soon as safe access is possible after the event

**The Isa Processing General Manager shall:**

- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam levels
- Notify Mount Isa LDMG of spillway levels, with updates every 8 hours.
- Notify key contacts on properties within 20km downstream of the dam, with updates every 8 hours.
- Notify GMIMSC, with updates every 8 hours.
- Notify DNRME that activation level has moved to “Lean Forward”
- Updates shall continue until water levels begin to recede, or dam levels exceed 1.5m over the spillway
- Sample notification messages are presented in Appendix H

4.3.3 Significant Flow over Spillway (greater than 1.5m depth of flow and rising)

Activation level: **STAND UP**

A trigger point of 1.5m above spillway crest level is set as a reference marker that the dam is experiencing a significant event. This level is just under a third of the way to the Probable Maximum Flood level.

Once the dam level reaches 1.5m above the spillway, road access to the caretaker’s residence is expected to be cut, power and phone lines are unlikely to be in service, and further floodwaters may endanger the caretaker’s residence. All communications with the Superintendent should be limited to essential information so as to preserve the availability of the Satellite Phone. The caretaker along with any other residents in the area should relocate to higher ground. It may be necessary to evacuate the caretaker and other residents via helicopter.

If flow over the spillway is more than 1.5m and rising then:
**The Rifle Creek Dam Caretaker shall:**
- Confirm with the IPGM regarding the intent to move into “Stand Up” activation level.
- Relocate to higher ground, such as through driving to the top of the right hand approach road together with any other persons on site.
- If safe, visually monitor dam levels at suitable intervals, including photographic records.
- Maintain regular communication with the IPGM to confirm caretaker’s safety
- If conditions are expected to be prolonged more than 24 hours or other safety issues arise, liaise with IPGM to arrange for evacuation via helicopter. Location of the default Helicopter Landing Point is shown on Figure A4.

**The Isa Processing General Manager shall:**
- Confirm with the Caretaker regarding the intent to move into “Stand Up” activation level.
- Liaise with the Caretaker to confirm the safety of the Caretaker and any other persons on site. If necessary, arrange for helicopter evacuation of persons on site (through Emergency Services).
- Notify Emergency Services of intent to move into “Stand Up”, and advise in relation to the status of the caretaker and any other persons on site.
- Notify GMIMSC of intent to move into “Stand Up”, and advise in relation to the status of the caretaker and any other persons on site.
- Notify Mount Isa LDMG of spillway levels, and the intent to move into “Stand Up” activation level.
- Notify key contacts on properties within 20km downstream of the dam, including Mica Creek Power Station.
- Notify DNRME of spillway levels, and the intent to move into “Stand Up” activation level.
- Monitor weather forecasts (minimum every 24 hours)
- Maintain communications with GMIMSC, Mount Isa LDMG, and affected residents every 8 hours.
- Sample notification messages are presented in Appendix H

**The Chairman of the Local Disaster Management Group shall:**
- Identify the impact of floodwaters on residents further than 20km downstream of the dam, and coordinate appropriate response measures.
- Liaise with the IPGM.

**4.3.4 Flow over Spillway Receding**

Activation level: **STAND DOWN**

If rainfall at the dam has ceased and flood levels are found to be receding over 3 consecutive hourly readings, then the impacts of flooding may assume to have peaked and the benefit of further warnings to properties is of limited value. In this instance:
The Rifle Creek Dam Caretaker shall:

- Continue to visually observe flood levels, record situation, record rainfall and report to the Isa Processing General Manager every 24 hours until the spillway is no longer overtopping
- Photograph flows at suitable intervals
- Inspect the dam as soon as safe access is possible after the event

The Isa Processing General Manager shall:

- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam levels
- Notify all previously contacted parties of the intent to move activation level to Stand Down.
- Sample notification messages are presented in Appendix H

Prepare an Emergency Event Report and forward to Director Dam Safety (DNRME) within 30 business days after the end of the emergency event.

4.4 Potential structural damage to dam

A number of events could indicate that the integrity of the dam may be compromised, including:

- Earthquakes, placing excessive stress on the dam structure
- Landslide along the abutment, potentially undermining the arch foundation
- Landslide along the reservoir rim, displacing a volume of water that will lead to a sudden rise in the dam level and potential flooding downstream
- Observation of significant areas of damage on dam face, such as new cracking or cavitation blowouts

The effects of dam failure is dependent on the volume of water stored at the time of failure. From the 2018 Failure Impact Assessment Report, the theoretical inundation extent relating to dam failure at Full Storage Capacity is shown by the area of light blue on Inundation Charts presented in Appendix B, referencing pages 44, 45, 46, 47, 51, 55, 59 and 63.

The theoretical inundation extent relating to dam failure when the dam level is at Probable Maximum Flow is shown by the area in light blue on Inundation Charts presented in Appendix B and is distinguishable from flood levels at PMF without dam break.

4.4.1 Events considered unlikely to pose risk of structural failure

With reference to Aurecon’s “Dam Integrity and Investigation Report” May 2014 and Aurecon’s “Construction Report” dated August 2015, the dam has been reviewed for the following load cases:

- 65% of PMF event, corresponding to a discharge flow of 513m$^3$/s with dam level at 2.33m above spillway.
- Earthquakes with horizontal accelerations up to 3.25m/s$^2$
Rifle Creek Dam
EMERGENCY ACTION PLAN

- A high degree of channel scour downstream of the toe (dam relies on arch action founding in the rock abutments for ultimate strength)
- Silt loading behind the dam up to 5m above the heel

Under such loading, a degree of cracking and/or base sliding may occur before full arch action forms, however the dam integrity is not expected to be compromised.

Accordingly, any event not listed in Sections 4.4.2, 4.4.3, 4.6.1 or 4.6.2 below may be deemed as not posing a risk of dam failure. The event should be followed up with a formal condition assessment inspection to confirm the dam integrity.

4.4.2 Events which may pose risk of structural failure

Activation level: **LEAN FORWARD**

The following items may indicate that the integrity of the dam has been compromised, and requires precautionary measures to be undertaken:

- Any act of terrorism or sabotage that may have affected the structure
- Earthquakes, with magnitude of over 4 on the Richter scale within 500km of the site. This may be approximated as an event which will be clearly felt by persons on site (or in Mount Isa).
- Observation of significant areas of damage to the dam face, such as significant new cracking or cavitation blowouts
- Any landslide along the abutment within 30m of the dam which could potentially undermine the arch foundation, or which affects the shotcrete abutment armouring.

Note – landslides into the catchment have the potential to displace a large volume of water over the dam wall, and for the purposes of the EAP should be treated as ‘Significant Flow over Spillway’ events as per Section 4.3.

Following identification of one or more of the above items, a potential risk of structural failure shall be noted and the following actions undertaken:

**The Rifle Creek Dam Caretaker shall:**

- As feasible, inspect all accessible areas of the dam to identify the extent of any damage, including new cracking, new seepage, deformation, or spalling of concrete on the dam face or abutments. Damage should be recorded in terms of notes estimating extent of damage as well as photographs.
- Continue to monitor and record the situation at suitable intervals until otherwise notified by the IPGM.

**The Isa Processing General Manager shall:**

- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam
- Notify Mount Isa LDMG of the potential structural risk
- Notify GMIMSC of the potential structural risk
- Notify Director Dam Safety (DNRME) within 48 hours of activating the EAP.
- Sample notification messages are presented in Appendix H
- Engage a detailed engineering assessment as soon as practical.

The need to notify key contacts on downstream properties and frequency of updates will depend on the outcomes of the structural investigation. There is little benefit in advising the contacts of defects until there is reasonable cause to believe that there is a realistic threat of a structural failure. Should the structural assessment identify that there is significant cause to notify downstream contacts then that would be managed under subroutine 4.4.3.
Activation level shall remain at Lean Forward until either a structural engineering review confirms the dam integrity has not been compromised, or 48 hours has passed without further increase in damage.

4.4.3 Potential indicators of imminent structural failure

Activation level: **STAND UP**

The following items may indicate that the integrity of the dam has been compromised, and requires immediate emergency measures to be undertaken:

- Earthquakes, with magnitude over 6 on the Richter scale within 250km of the site. This may be approximated as an event which causes significant damage to most buildings, and is felt as strong shaking by persons on site (or in Mount Isa).
- Observation of major areas of damage on dam face, such as new cracking actively leaking water greater than 1 litre per minute, any relative movement of part of the dam wall greater than 10mm, or cavitation blowouts over 1m$^2$ in area.

Following identification of one or more of the above items, an imminent risk of structural failure shall be noted and the following actions undertaken:

**The Rifle Creek Dam Caretaker shall:**

- Move to a safe location and as feasible continue to monitor visible areas of the dam to identify the extent of any damage, including new cracking, new seepage, deformation, or spalling of concrete on the dam face or abutments. Damage should be recorded in terms of notes estimating extent of damage as well as photographs.
- Continue to monitor and record the situation at suitable intervals until otherwise notified by the IPGM.

**The Isa Processing General Manager shall:**

- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam.
- Notify Mount Isa LDMG of the imminent risk of dam failure, with progressive updates on an hourly basis.
- Notify key contacts on properties within 20km downstream of the dam of the imminent risk of dam failure.
- Notify Mica Creek Power Station and Diamantina Power Station of the dam of the imminent risk of dam failure.
- Notify GMIMSC of the imminent risk of dam failure, with progressive updates on an hourly basis.
- Sample notification messages are presented in Appendix H.
- Notify Director Dam Safety (DNRME) within 48 hours of activating the EAP.
- Engage a detailed engineering assessment as soon as practical.

Once elevated to Stand Up, the event will be managed by either the Mount Isa LDMG or DDMG as appropriate, whom will determine the frequency of ongoing updates.

Activation level shall remain at Stand Up until either a structural engineering review confirms the dam integrity has not been compromised, 48 hours has passed without further increase in damage.
4.4.4 Structural concerns managed
Activation level: **STAND DOWN**

Once either 48 hours has elapsed without further increase in the observed structural damage, or an engineering assessment has been undertaken and any prescribed actions to make the dam safe have been undertaken then:

**The Isa Processing General Manager shall:**
- Notify all previously contacted parties of the intent to move activation level to Stand Down.
- Sample notification messages are presented in Appendix H.
- Ensure that an appropriate structural engineering assessment has been undertaken to address the observed defects as soon as possible if not already done so, and all recommended follow up actions prescribed by the certifying engineer are closed out.
- Prepare an Emergency Event Report and forward to Director Dam Safety (DNRME) within 30 business days after the end of the emergency event.

4.4.5 New area of seepage, significant increase in seepage, or significant unexplained loss of storage contents

As the dam is constructed from mass concrete keyed into bedrock, seepage through the dam or abutments is unlikely to lead to a progressive failure.

New areas of seepage, significant increases in seepage or significant unexplained loss of storage contents should be followed up with dam safety inspection, but does not trigger actions under the EAP.

4.5 Potential contamination of dam

Contamination of the dam potentially affects the environment, the users of the water including the downstream properties, Mica Creek Power Station and Diamantina Power Station. Early containment of the contamination and notification of the appropriate emergency services is critical.

Any operations undertaken by GMIM or Contractors which have the potential to contaminate a watercourse must include provision of a suitable spill collection kit and environmental management plan.

4.5.1 Object crashing into the dam or dam catchment

Activation level: **STAND UP**

Given the remote location and lack of existing access into the dam catchment, it is considered unlikely that aircraft, machinery, vehicles or materials will be dropped into or damaged within the dam catchment.

However, in the event that an incident occurs which contaminates or has the potential to contaminate the water supply:

**The Rifle Creek Dam Caretaker / person first identifying hazard shall:**
- Contact emergency services as soon as possible
- Identify the hazardous substance if possible
- Contact IPGM and GMIMSC
• Take reasonable steps to isolate the spill or contaminant from the storage and prevent further contamination
• If storage is contaminated, shut off the outlet pipe valve at the base of the dam.

**The Isa Processing General Manager shall:**

- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the hazard
- Notify key contacts on properties within 20km downstream of the dam of the contamination and decision to cut of water supply.
- Notify Mica Creek Power Station and Diamantina Power Station of the contamination and decision to cut of water supply.
- Notify Mount Isa LDMG
- Sample notification messages are presented in Appendix H
- Notify Director Dam Safety (DNRME) within 48 hours of activating the EAP.

Once elevated to Stand Up, the event will be managed by either the Mount Isa LDMG or DDMG as appropriate, whom will determine the frequency of ongoing updates

**Activation level shall remain at Stand Up until the emergency response team has confirmed that the contamination has been controlled.**

### 4.5.2 Contamination concerns managed

**Activation level: **STAND DOWN

Once the team responsible for managing the contamination have confirmed that the contamination has been managed:

**The Isa Processing General Manager shall:**

- Notify all previously contacted parties of the intent to move activation level to Stand Down.
- Sample notification messages are presented in Appendix H
- Prepare an Emergency Event Report and forward to Director Dam Safety (DNRME) within 30 business days after the end of the emergency event.

### 4.6 Terrorism / Security Threat

The emergency action described in this section relates to a potential dam hazard due to a terrorist threat or activity.

The vulnerability of Rifle Creek Dam to a terrorist attack is low.

The area likely to be affected by this dam hazard is described as:

- if dam failure does not occur then there will not be any area affected
- if dam failure does occur then the maximum area affected is the level shown by the SDF marked areas on the maps in Appendix B

#### 4.6.1 Terrorism or security threat which may pose risk of structural failure

**Activation level: **LEAN FORWARD

The following items may indicate that the integrity of the dam has been compromised, and requires precautionary measures to be undertaken:
• Observation of significant areas of damage to the dam face due to terrorism activity or
• Suspicious behaviour noticed at the dam or surrounding area.

Following identification of one or more of the above items, a potential risk of structural failure shall be noted and the following actions undertaken:

**The Rifle Creek Dam Caretaker shall:**

• As feasible, inspect all accessible areas of the dam to identify the extent of any damage, including new cracking, new seepage, deformation, or spalling of concrete on the dam face or abutments. Damage should be recorded in terms of notes estimating extent of damage as well as photographs.
• Continue to monitor and record the situation at suitable intervals until otherwise notified by the IPGM.

**The Isa Processing General Manager shall:**

• Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam
• Notify Police or National Security hotline
• Notify Mount Isa LDMG of the potential structural risk
• Notify MIMSC of the potential structural risk
• Notify Director Dam Safety (DNRME) within 48 hours of activating the EAP.
• Sample notification messages are presented in Appendix H
• Engage a detailed engineering assessment as soon as practical.

The need to notify key contacts on downstream properties and frequency of updates will depend on the outcomes of the structural investigation. There is little benefit in advising the contacts of defects until there is reasonable cause to believe that there is a realistic threat of a structural failure. Should the structural assessment identify that there is significant cause to notify downstream contacts then that would be managed under subroutine 4.4.3.

Activation level shall remain at Lean Forward until either a structural engineering review confirms the dam integrity has not been compromised, or 48 hours has passed without further increase in damage.

4.6.2 Potential indicators of imminent structural failure from a terrorism or security threat

**Activation level:** STAND UP

The following item may indicate that the integrity of the dam has been compromised, and requires immediate emergency measures to be undertaken:

• Observation of major areas of damage on dam face, such as new cracking actively leaking water greater than 1 litre per minute, any relative movement of part of the dam wall greater than 10mm, or cavitation blowouts over 1m² in area due to an explosion or object crashing into wall.

Following identification of one or more of the above items, an imminent risk of structural failure shall be noted and the following actions undertaken:

**The Rifle Creek Dam Caretaker shall:**

• Move to a safe location and as feasible continue to monitor visible areas of the dam to identify the extent of any damage, including new cracking, new seepage, deformation, or spalling of concrete on the dam face or abutments. Damage should be recorded in terms of notes estimating extent of damage as well as photographs.
• Continue to monitor and record the situation at suitable intervals until otherwise notified by the IPGM.
The Isa Processing General Manager shall:

- Liaise with the Rifle Creek Dam Caretaker or otherwise monitor the dam.
- Notify Police or National Security hotline
- Notify Mount Isa LDMG of the imminent risk of dam failure, with progressive updates on an hourly basis.
- Notify key contacts on properties within 20km downstream of the dam of the imminent risk of dam failure.
- Notify Mica Creek Power Station and Diamantina Power Station of the imminent risk of dam failure.
- Notify MIMSC of the imminent risk of dam failure, with progressive updates on an hourly basis.
- Sample notification messages are presented in Appendix H.
- Notify Director Dam Safety (DNRME) within 48 hours of activating the EAP.
- Engage a detailed engineering assessment as soon as practical.

Once elevated to Stand Up, the event will be managed by either the Mount Isa LDMG or DDMG as appropriate, whom will determine the frequency of ongoing updates.

Activation level shall remain at Stand Up until either a structural engineering review confirms the dam integrity has not been compromised, 48 hours has passed without further increase in damage.

4.6.3 Structural concerns managed

Activation level: **STAND DOWN**

Once either 48 hours has elapsed without further increase in the observed structural damage, or an engineering assessment has been undertaken and any prescribed actions to make the dam safe have been undertaken then:

The Isa Processing General Manager shall:

- Notify all previously contacted parties of the intent to move activation level to Stand Down.
- Sample notification messages are presented in Appendix H.
- Ensure that an appropriate structural engineering assessment has been undertaken to address the observed defects as soon as possible if not already done so, and all recommended follow up actions prescribed by the certifying engineer are closed out.
- Prepare an Emergency Event Report and forward to Director Dam Safety (DNRME) within 30 business days after the end of the emergency event.
5 Supporting Documents and Reference Material

The following supporting documents form part of the Emergency Action Plan:

- Rifle Creek Dam Failure Impact Assessment (Aurecon, October 2018)
- Rifle Creek Dam Failure Impact Assessment (SMEC, October 2012)
- Queensland Dam Safety Management Guidelines (February 2002)
- ANCOLD Guidelines on Dam Safety Management (August 2003)
- Mines Regulations Act 1964 – 1983
- Metalliferous Mining Regulations 1995
- Mining and Quarrying Safety and Health Act 1999
- Mining and Quarrying Safety and Health Regulations 2001.

5.1 List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20kRes</td>
<td>Key contacts on properties within 20km downstream of the dam, including Mica Creek Power Station</td>
</tr>
<tr>
<td>IPGM</td>
<td>Mount Isa Mines Isa Processing General Manager</td>
</tr>
<tr>
<td>DCF</td>
<td>Dam Crest Flood</td>
</tr>
<tr>
<td>DCL</td>
<td>Dam Crest Level</td>
</tr>
<tr>
<td>DNRME</td>
<td>Director of Dam Safety, DNRME</td>
</tr>
<tr>
<td>EAP</td>
<td>Emergency Action Plan</td>
</tr>
<tr>
<td>EER</td>
<td>Emergency Event Report</td>
</tr>
<tr>
<td>FSL</td>
<td>Full Supply Level</td>
</tr>
<tr>
<td>GMIM</td>
<td>Glencore Mount Isa Mines</td>
</tr>
<tr>
<td>GMIM Datum</td>
<td>Glencore Mount Isa Mines Security Control</td>
</tr>
<tr>
<td>GMIMSC</td>
<td>Glencore Mount Isa Mines Security Control</td>
</tr>
<tr>
<td>Mount Isa LDMG</td>
<td>Chairman of the Mount Isa Local Disaster Management Group</td>
</tr>
<tr>
<td>MMI</td>
<td>Modified Mercalli Intensity</td>
</tr>
<tr>
<td>PAR</td>
<td>Population at Risk</td>
</tr>
<tr>
<td>PMF</td>
<td>Probable Maximum Flood</td>
</tr>
<tr>
<td>SDF</td>
<td>Sunny Day Failure</td>
</tr>
</tbody>
</table>
## 5.2 Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>the Act</td>
<td>Water Supply (Safety and Reliability) Act 2008</td>
</tr>
<tr>
<td>Affected Persons</td>
<td>Any persons which would be significantly and adversely affected as a result of an event, such as expected to lose an essential resource or be subject to an increased safety risk.</td>
</tr>
<tr>
<td>Alert</td>
<td>The first stage of emergency response whereby a heightened level of vigilance is maintained due to the possibility of an emergency event occurring. Action is required to ensure the situation is monitored by someone capable of assessing the potential of the threat.</td>
</tr>
<tr>
<td>Controlled document</td>
<td>Having an EAP issued as a ‘controlled document’ means that specified copies of a document are kept up to date in a controlled manner using a system that distributes updated versions/pages of the document as they are issued and retrieves superseded versions/pages of the document as they become redundant. In this way, only the current version of the document is used during any event. A controlled document requires the following metadata to be recorded in the document and securely archived:</td>
</tr>
<tr>
<td></td>
<td>• Contents, versions and dates of versions;</td>
</tr>
<tr>
<td></td>
<td>• Name and role of the person approving each version and details of any prior consultation undertaken; and</td>
</tr>
<tr>
<td></td>
<td>• Names and roles of persons issued with copies.</td>
</tr>
<tr>
<td>Dam Crest Flood (DCF)</td>
<td>A flood event occurring when the dam is initially at Full Supply Level and results in maximum discharge from the dam correlating to the crest of the dam wall.</td>
</tr>
<tr>
<td>Dam Crest Level (DCL)</td>
<td>The level correlating to the top of the dam wall</td>
</tr>
<tr>
<td>Downstream release hazard</td>
<td>The Act defines a downstream release hazard in relation to a dam to be a reasonably foreseeable hazard to the safety of persons or property that could potentially be caused or aggravated by—(a) a release of water from the dam’s spillway; or (b) a controlled release of the water from the dam. Example—flooding of downstream properties and transport infrastructure caused by a release of water</td>
</tr>
<tr>
<td>Emergency Event Report (EER)</td>
<td>Report on the performance of the dam and the functioning of the EAP during emergency event which is presented to the chief executive following the end of the event</td>
</tr>
<tr>
<td>Failure Impact Assessment (FIA)</td>
<td>It is a process used under the Act to determine the number of people whose safety could be at risk should the dam fail. This assessment must be certified by a registered professional engineer in accordance with the Act</td>
</tr>
<tr>
<td>Full Supply Level (FSL)</td>
<td>A situation where the dam storage is at the level of the spillway.</td>
</tr>
<tr>
<td>Lean Forward</td>
<td>The stage of emergency response prior to ‘stand up’ whereby a heightened level of situational awareness of a disaster event (either current or impending) is maintained and a state of operational readiness is developed. Personnel at dam are on standby; ready to activate EAP.</td>
</tr>
<tr>
<td>Local Disaster Management Group (Mount Isa LDMG)</td>
<td>Local Disaster Management Groups are established to support local government disaster management activities. The Local Group is supported by the relevant District Group if and when disaster management activities exceed the capacity of a Local Group. The functions of the Local Group include (but are not limited to):</td>
</tr>
<tr>
<td></td>
<td>• develop, regularly review and assess effective disaster management;</td>
</tr>
<tr>
<td></td>
<td>• assist local government for its area to prepare a local disaster management plan;</td>
</tr>
<tr>
<td></td>
<td>• ensuring the community is aware of ways of mitigating the adverse effects of an event, and preparing for, responding to and recovery from a disaster;</td>
</tr>
<tr>
<td></td>
<td>• identify, and coordinate the use of resources that may be used for disaster operations;</td>
</tr>
<tr>
<td></td>
<td>• manage disaster operations in the area under policies and procedures decided by the State Group; and</td>
</tr>
<tr>
<td></td>
<td>• ensuring disaster management and disaster operations in the area are consistent with the State Group’s SPF for disaster management for the State.</td>
</tr>
<tr>
<td>Population at Risk (PAR)</td>
<td>The number of people calculated under the FIA guidelines, whose safety will be at risk if the dam, or the proposed dam after its construction, fails.</td>
</tr>
</tbody>
</table>
**Referable Dam**

A dam, or a proposed dam after its construction will be a referable dam if—
(a) a failure impact assessment of the dam, or the proposed dam, is required to be carried out under the Act; and
(b) the assessment states the dam has, or the proposed dam after its construction will have, a category 1 or category 2 failure impact rating; and
(c) The chief executive has, under section 349 of the Act, accepted the assessment.

**Stand down**

The final stage of emergency response when there is no longer a requirement to respond to the event and the threat is no longer present. At ‘stand down’ there is a transition from responding to an event back to normal core business and/or recovery operations.

**Stand up**

The operational state following ‘lean forward’ whereby resources are mobilised, personnel are activated and operational activities commenced. Moving into this operational state triggers the requirement for an emergency event report.

**Sunny Day failure / Sunny Day dam break**

The failure of a dam without any other general flooding or spillway discharges. Generally taken from the dam being initially at Full Supply Level.
Appendices

Appendix A

Locality Map

Distances and Times
From Duchess Rd. (end of bitumen) to Rifle Creek Dam
By Road = 26.8km
By Air = 22.0km

By Road = Approx. 30mins in dry/normal conditions.

In flood events, the road would be cut in various river and creek crossings.

During flood the dam wall is only accessible by air.

Figure A1. – Google Earth Map of Mount Isa to Rifle Creek Dam via Duchess Rd
Figure A2. – Google Map of Rifle Creek Access Road from city of Mount Isa
Figure A3. – Google Map of Rifle Creek Dam

Figure A4. – Google Earth view of Rifle Creek Dam
Appendix B

Flood Inundation Maps Mount Isa City and Warning times
Breach hydrographs for the Sunny Day and Flood Failure Scenarios can be found in Figure 4, Figure 5, Figure 6 and Figure 7.

**Sunny Day Failure - Rifle Creek Dam**

![Sunny Day Failure Graph]

**Flood Failure - Rifle Creek Dam**

![Flood Failure Graph]

Figure 4 – Breach Hydrograph - Sunny Day Dam Failure Scenario

Figure 5 – Breach Hydrograph - 1 in 10,000 AEP Flood Failure
Flood Inundation Maps - Residents 20klms and Warning times
## Rifle Creek Dam

**EMERGENCY ACTION PLAN**

<table>
<thead>
<tr>
<th>Date</th>
<th>Project</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>8/10/2018</td>
<td>Rifle Creek Dam Failure Impact Assessment</td>
<td>1D HEC-RAS Assessment - Carbeen Park - 1 in 40,000 AEP Event Inundation Extents</td>
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</tbody>
</table>

- **Direction of Flow**
  - No Dam Failure Flood Extents
  - Dam Failure Flood Extents
<table>
<thead>
<tr>
<th>Date</th>
<th>Project</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/10/2018</td>
<td>Rifle Creek Dam Failure Impact Assessment</td>
<td>1D HEC-RAS Assessment - Melaleuca - Sunny Day Failure</td>
</tr>
<tr>
<td>Date</td>
<td>Project</td>
<td>Title</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>8/10/2018</td>
<td>Rifle Creek Dam Failure Impact Assessment</td>
<td>1D HEC-RAS Assessment - Melaleuca - PMF</td>
</tr>
</tbody>
</table>

**Direction of Flow**

**Legend:**
- No Dam Failure Flood Extents
- Dam Failure Flood Extents
<table>
<thead>
<tr>
<th>Date</th>
<th>Project</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/10/2018</td>
<td>Rifle Creek Dam Failure Impact Assessment</td>
<td>1D HEC-RAS Assessment - Rifle Creek Station - PMF</td>
</tr>
</tbody>
</table>

**Direction of Flow**

- Black: No dam failure flood extents
- Blue: Dam failure flood extents
<table>
<thead>
<tr>
<th>Date</th>
<th>Project</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/10/2018</td>
<td>Rifle Creek Dam Failure Impact Assessment</td>
<td>1D HEC-RAS Assessment - Rifle Creek Station - 1 in 40,000 AEP Event</td>
</tr>
</tbody>
</table>

- **Direction of Flow**
- **No Dam Failure Flood Extents**
- **Dam Failure Flood Extents**
<table>
<thead>
<tr>
<th>Date</th>
<th>Project</th>
<th>Rifle Creek Dam Failure Impact Assessment</th>
<th>1D HEC-RAS Assessment - Rifle Creek Station - 1 in 10,000 AEP Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/10/2018</td>
<td>No Dam Failure Flood Extents</td>
<td>2019-01-01 (Release Date)</td>
<td></td>
</tr>
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</table>
Appendix C

Weather Information (Flood Warning)


**FLOOD WARNING**

Using the Internet - [www.bom.gov.au](http://www.bom.gov.au)

**Queensland Flood Warning Information**

**Queensland Warnings Summary**

This page provides a summary of the valid weather warnings issued in this state.

This page automatically refreshes whenever a warning is issued. Click on the warning link for more information.

**Queensland Flood Warning Information**
Radar Images

Place cursor over AUSTRALIA then click Radar Images

Click on Mount Isa to view Mount Isa Radar Loop
Rainfall and River Conditions

Place cursor over QLD then click Rainfall & River Conditions
Appendix D

Discharge and Storage Curves

![Discharge and Storage Curves Diagrams]

*Figure 3. Stage Discharge Relationship*

*Figure 4. Stage Storage Relationship*
## Appendix E

### Modified Mercalli Scale

<table>
<thead>
<tr>
<th>No.</th>
<th>Descriptive Term</th>
<th>Description</th>
<th>Acceleration (cm/s²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Imperceptible</td>
<td>Not felt. Marginal and long-period effects of large earthquakes.</td>
<td>&lt;1</td>
</tr>
<tr>
<td>II</td>
<td>Very Slight</td>
<td>Felt by persons at rest, on upper floor, or favourably placed.</td>
<td>1-2</td>
</tr>
<tr>
<td>III</td>
<td>Slight</td>
<td>Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognised as an earthquake.</td>
<td>2-5</td>
</tr>
<tr>
<td>IV</td>
<td>Moderate</td>
<td>Hanging objects swing. Vibration like passing of heavy trucks or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink, crockery clashes. In upper range of IV, wooden walls and frames creak.</td>
<td>5-10</td>
</tr>
<tr>
<td>V</td>
<td>Rather Strong</td>
<td>Felt outdoors; direction estimated. Sleepers waken. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.</td>
<td>10-20</td>
</tr>
<tr>
<td>VIII</td>
<td>Destructive</td>
<td>Steering of motor cars affected. Damage to masonry C: partial collapse. Some damage to masonry B, none to masonry A. Fall of stucco, some masonry walls. Twisting, fall of chimneys factory stacks, monuments, towers, elevated tanks. Frame houses move on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground, on steep slopes.</td>
<td>100-200</td>
</tr>
<tr>
<td>IX</td>
<td>Devastating</td>
<td>General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. Frame structures, if not bolted, shifted off foundations. Frames cracked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alleviated areas sand, mud ejected, earthquake fountains, sand craters.</td>
<td>200-500</td>
</tr>
<tr>
<td>X</td>
<td>Annihilating</td>
<td>Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and</td>
<td>500-1000</td>
</tr>
<tr>
<td>Level</td>
<td>Type</td>
<td>Description</td>
<td>Scale</td>
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</tr>
<tr>
<td>XI</td>
<td>Disaster</td>
<td>Disaster Rails bent greatly. Underground pipelines completely out of service.</td>
<td>1000-2000</td>
</tr>
<tr>
<td>XII</td>
<td>Major Disaster</td>
<td>Major Disaster Damage nearly total. Large rock masses displaced. Line of sight and level distorted. Objects thrown into the air.</td>
<td>&gt;2000</td>
</tr>
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</table>
## Appendix F

### EMERGENCY RESOURCES

In an emergency situation, equipment, supplies and construction personnel will likely be needed on short notice. The table below lists general emergency resources, and also indicates how to access them.

<table>
<thead>
<tr>
<th>Item</th>
<th>Contact/Telephone</th>
<th>Location</th>
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<tbody>
<tr>
<td>General</td>
<td>Remploy 4743 4190</td>
<td>101 Duchess Road Mt Isa</td>
</tr>
<tr>
<td>Front end Loader</td>
<td>Remploy 4743 4190</td>
<td>101 Duchess Road Mt Isa</td>
</tr>
<tr>
<td>Excavators</td>
<td>Remploy 4743 4190</td>
<td>101 Duchess Road Mt Isa</td>
</tr>
<tr>
<td>Sand &amp; Gravel</td>
<td>Remploy 4743 4190</td>
<td>101 Duchess Road Mt Isa</td>
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<tr>
<td>Sandbags</td>
<td>IDC Store 4744 2350</td>
<td>Glencore Mount Isa Mines</td>
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<tr>
<td>Pumps</td>
<td>Coates Hire 47491902</td>
<td>Barkly Highway Mt Isa</td>
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<tr>
<td>Labourers’</td>
<td>Remploy 4743 4190</td>
<td>101 Duchess Road Mt Isa</td>
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<tr>
<td>Tradesmen</td>
<td>Schmider 0403 045 588</td>
<td>Commercial Road Mt Isa</td>
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<td></td>
<td>Custom Steel Fabrication</td>
<td>2 Traders Way Mt Isa</td>
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<tr>
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<td>0447 011 412</td>
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<tr>
<td>Pipe</td>
<td>One Steel 4743 4089</td>
<td>45 Commercial Road Mt Isa</td>
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<tr>
<td>Helicopter</td>
<td>NQ Rescue Helicopter 4743 0937</td>
<td>Mount Isa Airport</td>
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Appendix G

DAM inspection checklist and SAFETY EMERGENCY SITUATION REPORT

Data Record – Weekly Inspection

SAMPLE RECORD SHEET

(To be completed by the Water Distribution Inspector / Caretaker and entered into the Log Book along with any accompanying photographs)

DATA RECORDS: RIFLE CREEK DAM WEEKLY INSPECTION DATA RECORD

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<th>ITEM</th>
<th>SATISFACTORY</th>
<th>DETAILS / COMMENT</th>
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<tr>
<td>Date and time</td>
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<td>Weather conditions</td>
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<td>Record reservoir water surface level</td>
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<td>Spillway discharge</td>
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<tr>
<td>VISUAL INSPECTION</td>
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<td>• Downstream toe of abutments</td>
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<tr>
<td>GENERAL COMMENTS</td>
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Carried out by: __________________________  Signature: __________________________

Date: __/__/__

Unless stamped in RED, this is an 'Uncontrolled Document'
## Data Record – Monthly Inspection

**SAMPLE RECORD SHEET**
(To be completed by the Water Distribution Inspector / Caretaker and entered into the Log Book along with any accompanying photographs)

### DATA RECORDS: RIFLE CREEK DAM MONTHLY INSPECTION DATA RECORD

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<td>- Auxiliary spillways</td>
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<td>- Upstream and downstream faces</td>
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<tr>
<td>- Downstream toe of abutments</td>
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</tbody>
</table>
| - Seepage on:  
  - Downstream face  
  - Abutments  
  - Veer-notch flow  
    1) Downstream of wall  
    2) Creek north of wall | | |
| **MISCELLANEOUS** | | |
| - Maintenance  
  - Minor  
  - Major | | |
| - Changes to normal operating procedure | | |
| - Unusual conditions or occurrences | | |
| - Emergency attendance | | |
| - Safety and special conditions | | |
| **GENERAL COMMENTS** | | |

Carried out by: ___________________________ 
Signature: ___________________________

Date: ___/___/___

Unless stamped in RED, this is an ‘Uncontrolled Document’
DAM SAFETY EMERGENCY SITUATION REPORT

Photocopy and fill-out after termination of Emergency Situation.
Complete ALL sections that are applicable to the situation.

Dam Name: ____________________________________________________________

Dam Location: __________________________________________________________

Date: ___________________________ Time: ________________________________

Weather Conditions: ____________________________________________________________________________________________

General Description of Emergency Situation: _____________________________________________________________________________

Area(s) of Dam Affected: ____________________________________________________________________________________________

Extent of Dam Damage: _____________________________________________________________________________________________

Possible Cause(s): _________________________________________________________________________________________________

Effect on dam’s operation: __________________________________________________________________________________________

Effect on operational capabilities of outlet works: _____________________________________________________________________

Initial Reservoir Elevation: ___________________________ Time: ___________________________

Maximum Reservoir Elevation: ___________________________ Time: _______________________

Final Reservoir Elevation: ___________________________ Time: _________________________

Description of area flooded downstream/damages/injuries/loss of life:
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Other Data and Comments:
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Observer’s name and telephone number: ___________________________________________
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**Distribution List:**

**Author’s Signature:**

(Print name, then sign.)  (Date)

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DAM LEVEL RECORD FOR

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Appendix H

Standard phone, SMS and email messages to the immediately affected downstream residents and others

**ALERT NOTIFICATION FOR SECTION 4.3.1** (Mount Isa LDMG, GMIMSC)

**Dam:** Rifle Creek

**Event:** 4.3.1 Dam spillway overtopping, increased downstream flows expected. Flood at XXXX (XXX below Abutment Crest Level).

**Act Level:** Alert. Moderate flooding possible.

**Notification Updates:** 24 hourly updates.

Refer: [www.bom.gov.au](http://www.bom.gov.au) and contact Local Emergency Mgt. Group on [number] for more details

**ALERT NOTIFICATION FOR SECTION 4.3.2** (Mount Isa LDMG, 20kRes, GMIMSC, DNRME)

**Dam:** Rifle Creek

**Event:** 4.3.2 Flood at XXXX and (rising / steady / falling).

**Act Level:** Lean Forward. Moderate flooding expected.

**Notification Updates:** 8 hourly updates.

Refer: [www.bom.gov.au](http://www.bom.gov.au) and contact Local Emergency Mgt. Group on [number] for more details

**ALERT NOTIFICATION FOR SECTION 4.3.3** (Mount Isa LDMG, 20kRes, GMIMSC, DNRME)

**Dam:** Rifle Creek

**Event:** 4.3.3 Flood at XXXX and (rising / steady / falling).

**Act Level:** Stand Up. High level of flooding expected.

**Notification:** Every 8 hours.

Refer: **Immediately contact** the Local Emergency Mgt. Group on [number] for more details
**ALERT NOTIFICATION FOR SECTION 4.3.4** (Mount Isa LDMG, 20kRes, GMIMSC, DNRME)

Dam: Rifle Creek  
Event: 4.3.4 Flood levels receding.  
Act Level: Stand Down. No further updates pending.  
Notification Updates: IPGM to notify all previously contacted parties of the intent to move activation level to Stand Down.  
Refer: [www.bom.gov.au](http://www.bom.gov.au) and contact Local Emergency Mgt. Group on [contact information] for more details.

**ALERT NOTIFICATION FOR SECTION 4.4.2** (Mount Isa LDGM, GMIMSC, DNRME)

Dam: Rifle Creek  
Event: 4.4.2 Potential structural integrity issue identified  
Act Level: Lean Forward.  
Notification Updates: After structural engineer can confirm integrity or 48 hours without further damage.  
Refer: Contact the Local Emergency Mgt. Group on [contact information] for more details.

**ALERT NOTIFICATION FOR SECTION 4.4.3** (Emergency Services, Mount Isa LDMG, GMIMSC, 20kRes, DNRME)

Dam: Rifle Creek  
Event: 4.4.3 – Dam structural condition identified with dam failure potential.  
Act Level: Stand Up.  
Notification Updates: After structural engineer can confirm integrity or 48 hours without further damage.  
Refer: Immediately contact the Local Emergency Mgt. Group on [contact information] for more details.

**ALERT NOTIFICATION FOR SECTION 4.4.4** (Emergency Services, Mount Isa LDMG, GMIMSC, 20kRes, DNRME, MIWB)

Dam: Rifle Creek  
Event: 4.4.4 – Dam structural condition identified with dam failure potential.  
Act Level: Stand Down. No further updates pending.  
Notification Updates: IPGM to notify all previously contacted parties of the intent to move activation level to Stand Down.
ALERT NOTIFICATION FOR SECTION 4.5.1 (Emergency Services, Mount Isa LDMG, GMIMSC, 20kRes, DNRME)

Dam: Rifle Creek
Event: Object crashing into dam or catchment
Act level: Stand Up.

Notification Updates: Until the emergency response teams can confirm contamination is under control.

Refer: Immediately contact Local Emergency Mgt. Group on for more detail.

ALERT NOTIFICATION FOR SECTION 4.5.2 (Emergency Services, GMIMSC, 20kRes, DNRME, MIWB)

Dam: Leichhardt River
Event: 4.5.2 – Object crashing into dam or catchment.
Act Level: Stand Down. No further updates pending.

Notification Updates: IPGM to notify all previously contacted parties of the intent to move activation level to Stand Down.

ALERT NOTIFICATION FOR SECTION 4.6.1 (Emergency Services, National Security Hotline, Mount Isa LDMG, MIMSC, 20kRes, DNRME)

Dam: Rifle Creek
Event: Terrorism or security threat which may pose risk of structural failure
Act Level: Lean Forward.

Notification Updates: After structural engineer can confirm integrity or 48 hours without further damage.

Refer: Immediately contact Local Emergency Mgt. Group on for more details.

ALERT NOTIFICATION FOR SECTION 4.6.2 (Emergency Services, National Security Hotline, Mount Isa LDMG, MIMSC, 20kRes, DNRME)

Dam: Rifle Creek
Event: Potential indicators of imminent structural failure from a terrorism or security threat
Act Level: Stand Up.

Notification Updates: After structural engineer can confirm integrity or 48 hours without further damage

Refer: Immediately contact the Local Emergency Mgt. Group on for more details.
ALERT NOTIFICATION FOR SECTION – 4.6.3 (Emergency Services, Mount Isa LDMG, GMIMSC, 20kRes, DNRME, MIWB)

Dam: Rifle Creek

Event: 4.6.3 – Structural concerns managed

Act Level: Stand Down. No further updates pending.

Notification Updates: IPGM to notify all previously contacted parties of the intent to move activation level to Stand Down.
Appendix I

Public Access to Notification List via Internet

**Using the Internet -**

http://www.mountisamines.com.au

Click on this link

Click on Sustainability

Click here for access to supply personal information to receive emergency notifications
Emergency notification database

Please complete your contact details in the form below to be added to the dam emergency notification database:

Name
Address
Home Phone
Work Phone
Mobile Phone
Email Address

I would like to receive emergency notifications for: Lake Moondarra

Submit

1. Fill out appropriate fields