

## EMERGENCY ACTION PLAN — MOURA OFFSTREAM STORAGE (ID 2033)

**ISSUE: 8.2** — September 2024    **Expiry:** 1 October 2026

Prepared by **Sunwater Limited**

Controlled Copy No.

**Gated:** No

**Staffed:** No

**Type:** Central core earth fill embankment

**Project:** Moura Offstream Storage EAP

**File no.:** 08-000377/001

**Address:** Use Lat/Lon

**Location:**    Lat.    -24.603796°    Lon.    149.973266°  
                         24°36'13.75"S                    149°58'23.73"E

Approved by the delegate of the Chief Executive,  
Department of Regional Development, Manufacturing  
and Water until 1 October 2026.

## Emergency activation quick reference

The Emergency Action Plan (EAP) for Moura Offstream Storage covers dam hazards evaluated within Sunwater's Dam Safety Management Program.

Use the following table to select the relevant section of the EAP that deals with the dam hazard. **Note: The Incident Coordinator (IC) is responsible for the decision to activate the EAP. Should the IC be unavailable, the Local Event Coordinator (LEC) or Dam Duty Officer (DDO) is responsible for the decision.**

Table 1: Emergency activation quick reference

| Dam Hazards and section numbers                                  | Activation Levels  |  |   |  |
|--|--|--|---|--|
|  | Alert  | Lean Forward   | Stand Up  | Stand Down   |
| Activation triggers for dam hazards                              |  |  |   |  |
| Flood operations<br>See section 5                                | <ul style="list-style-type: none"> <li>EL 126.19 m (0.1 m below spillway crest level and rising)</li> </ul>  | <ul style="list-style-type: none"> <li>Storage above 126.29 m (spillway crest level)</li> </ul>  | <ul style="list-style-type: none"> <li>Storage above EL 126.39 m (flood of record)</li> </ul>   | <ul style="list-style-type: none"> <li>Storage level EL126.29 m and falling with no forecast increase in EL</li> </ul> |
| Piping: embankment, foundation, or abutments<br>See section 6    | <ul style="list-style-type: none"> <li>Increasing leakage through an embankment, the foundations, or abutments</li> </ul>                            | <ul style="list-style-type: none"> <li>Increasing leakage through an embankment, the foundations, or abutments with cloudy water</li> </ul>  | <ul style="list-style-type: none"> <li>Piping condition has been established</li> </ul>   | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>         |
| Earthquake<br>See section 7                                      | <ul style="list-style-type: none"> <li>Earthquake reported or felt in the area, AND</li> <li>Intensity less than 5 Modified Mercalli (MM)</li> </ul> | <ul style="list-style-type: none"> <li>Earthquake reported or felt in the area, AND</li> <li>Intensity greater than or equal to 5MM, OR</li> <li>Intensity less than 5MM and change detected during surveillance inspection</li> </ul> | <ul style="list-style-type: none"> <li>Earthquake reported or felt in the area, AND</li> <li>A possible failure path has been identified</li> </ul>   | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>         |
| Terrorist threat/activity or high energy impact<br>See section 8 | <ul style="list-style-type: none"> <li>Not applicable</li> </ul>   | <ul style="list-style-type: none"> <li>Not applicable</li> </ul>   | <ul style="list-style-type: none"> <li>Possible terrorist activity noticed at the dam or threat received</li> <li>Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)</li> <li>Failure in progress or likely due to impact or explosion</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>         |

**CONTINUED NEXT PAGE: EMERGENCY ACTIVATION QUICK REFERENCE**



**ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO**  
e.g., taking photographs/video, dam inspections, instrument readings



## Emergency activation quick reference – Other Emergency Situations

The EAP for Moura Offsite Storage covers one other emergency situation evaluated within Sunwater's Dam Safety Management Program. Use the following table to select the relevant section of the EAP that deals with the other emergency situation. **Note: The Incident Coordinator (IC) is responsible for the decision to activate the EAP. Should the IC be unavailable, the Local Event Coordinator (LEC) or Dam Duty Officer (DDO) is responsible for the decision.**

Table 1: Emergency activation quick reference (continued)

| Other Emergency Situations and section numbers | Activation levels   |   |  |
|--|---|---|--|
|  | Communications Failure – Dam Site (DDO)   | Communications Failure – Local Area (LEC/ORR)   | Communications Failure – Brisbane (IC/DSTDM)   |
|  | <ul style="list-style-type: none"> <li>Site managed (DDO - becomes LEC)</li> </ul>          | <ul style="list-style-type: none"> <li>Brisbane managed by Incident Coordinator (IC)</li> </ul> | <ul style="list-style-type: none"> <li>Locally managed by Local Event Coordinator (LEC)</li> </ul>   |
|  | Activation triggers for other emergency situations  |   |  |
| Comms Failure<br>See section 9                 | <ul style="list-style-type: none"> <li>Unable to communicate to or from dam site</li> </ul> | <ul style="list-style-type: none"> <li>Unable to communicate to or from local area</li> </ul>   | <ul style="list-style-type: none"> <li>Unable to communicate to or from Sunwater Brisbane</li> </ul> |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



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## Document control

### Authorisation of document

| Name  | Position/role                                 | Signature  | Date       |
|---|---|--|------------|
|  | EAP Program Lead<br>— Prepared for submission |  | 24/09/2024 |

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### Document revision history

| Issue | Date           | Prepared by | Reason for Change  | Ref. no.     |
|-------|----------------|-------------|--|--------------|
| 1     | March 2008     |             | Significant changes of Moura Offstream Storage Emergency Action Plan to reflect Sunwater Management structure and other minor changes.   |              |
| 2     |                |             | Created but not issued—will be issued as Issue 3, consistent with all 2011 EAPs.   |              |
| 3     | October 2011   |             | Significant changes to all sections of Moura Offstream Storage Emergency Action Plan to reflect current Sunwater Management structure and other changes.   |              |
| 4     | October 2015   |             | New Emergency Action Plan developed at expiry of 3E approval.<br>Issued for consultation with Relevant Disaster Management Groups.   | HB # 1820869 |
| 5     | September 2016 |             | Updates to notification & communication lists and Emergency Alert sections.  | HB # 2026781 |
| 6     | October 2017   |             | New Emergency Action Plan with minor amendments including contact list updates.  | HB # 2106041 |
| 7     | October 2018   |             | Revised and reviewed Emergency Action Plan developed at expiry of approval. Also includes: updates that reflect the Water Legislation (Dam Safety) Amendment Act 2017, implementation of changes to Sunwater management structure, new event management roles and addition of new Emergency Activation section (Other Emergency Situations). | HB # 2288354 |
| 7.1   | September 2019 |             | Amended contacts and associated sections, e.g., Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.  | HB # 2473055 |
| 7.2   | September 2020 |             | Amended contacts and associated sections, e.g., Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.  | HB # 2572819 |
| 7.3   | September 2021 |             | Amended contacts and associated sections, e.g., Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes such as removing Comprehensive Risk Assessments description (2.9) and simplifying FODM role in Activation triggers (5.2.1) including removing para 5.2.2.                       | HB # 2653213 |
| 7.4   | September 2022 |             | Amended contacts and associated sections. Minor error corrections and other non-substantive changes. The Chemical Hazard section has been removed as it is not a Dam Safety Hazard and is dealt with in other more relevant documents.   | HB # 2726200 |

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| Issue | Date           | Prepared by | Reason for Change   | Ref. no.  |
|-------|----------------|-------------|---|-----------|
| 8.0   | May 2023       |             | Amendments to Dam details (3) including PAR, along with Table 2. Updated Dam hazard overview (5.1) and with historical floods in Table 3. Flood emergency action triggers, stand up levels, and actions updated (5). Minor changes to messages in Table 8. Inundation and downstream notification maps updated and DCF removed (Appendix B). Catchment map added (Appendix B5). Updated PMF map to be consistent with other maps. Minor error corrections and other non-substantive changes to improve readability and useability. Updated AWS message in EA Request form and added Annexe SMS Messages. Added Fatigue Management Procedure to Section 2.8. Added SOP 12 to 1.1 References/associated documents | # 2743924 |
| 8.1   | September 2023 |             | Updated equipment in Appendix C1. Non-substantive updates as part of Annual Safety Statement. Minor error corrections and readability improvements.   | # 2811522 |
| 8.2   | September 2024 |             | Wet Season Preparedness – contact updates   | # 2865463 |

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### Controlled document distribution list

| Copy no. | Position   | Location                      |
|----------|--|-------------------------------|
| 1.       | Operator Maintainer  | Sunwater, Theodore            |
| 2.       | Operations Manager   | Sunwater, Biloela             |
| 3.       | Emergency Action Plan Program Lead                                       | Sunwater, Brisbane            |
| 4.       | Deputy Local Disaster Coordinator—Local Disaster Management Group (LDMG) | Banana Shire Council, Biloela |
| 5.       | Officer in Charge—Theodore (QPS1)  | Police, Theodore              |
| 6.       | Officer in Charge—Moura (QPS2)   | Police, Moura                 |

Note: Communication information for each 'Controlled Copy Holder' is attached in Appendix A

### Electronic document distribution list

Printed electronic copies are considered uncontrolled copies.

| Position                                       | Location                        |
|--|---------------------------------|
| District Disaster Coordinator—Gladstone (DDMG) | Police, Gladstone               |
| Senior Flood Forecaster                        | Bureau of Meteorology, Brisbane |

**Note:** Communication information for each 'Electronic Copy Holder' is in Appendix A.

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## 1. References, abbreviations, and definitions

### 1.1 References/associated documents

| Ref. | Document title  | Reference/location  |
|------|---|---|
| A    | Emergency action plan for referable dam guideline (RDMW 2021)                                       | <a href="https://www.resources.qld.gov.au/_data/assets/pdf_file/0018/84015/eap-guideline.pdf">https://www.resources.qld.gov.au/_data/assets/pdf_file/0018/84015/eap-guideline.pdf</a>   |
| B    | Guidelines on Selection of Acceptable Flood Capacity for Dams (ANCOLD, 2000)                        | ANCOLD  |
| C    | Guidelines on Consequence Categories for Dams (ANCOLD, 2012)  | ANCOLD ISBN: 978-0-9808192-5-0  |
| D    | Australian Rainfall and Runoff (ARR) 2019   | <a href="http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/">http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/</a>   |
| E    | Guideline for Failure Impact Assessment of Water Dams (DNRME 2018)                                  | <a href="https://www.resources.qld.gov.au/_data/assets/pdf_file/0005/78836/guidelines-failure-impact-assessment.pdf">https://www.resources.qld.gov.au/_data/assets/pdf_file/0005/78836/guidelines-failure-impact-assessment.pdf</a>   |
| F    | Water Act 2000  | <a href="https://www.legislation.qld.gov.au/view/pdf/inforce/curr/act-2000-034">https://www.legislation.qld.gov.au/view/pdf/inforce/curr/act-2000-034</a>   |
| G    | Water Supply (Safety and Reliability) Act 2008 — Current 08 March 2022                              | <a href="https://www.legislation.qld.gov.au/view/whole/pdf/inforce/current/act-2008-034">https://www.legislation.qld.gov.au/view/whole/pdf/inforce/current/act-2008-034</a>   |
| H    | Queensland Dam Safety Management Guidelines (DNRME October 2020)                                    | <a href="https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0007/78838/dam-safety-management.pdf">https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0007/78838/dam-safety-management.pdf</a>   |
| I    | Professional Engineers Act 2002 (RPEQ) (September 2013)   | <a href="https://www.legislation.qld.gov.au/view/pdf/inforce/2013-09-23/act-2002-054">https://www.legislation.qld.gov.au/view/pdf/inforce/2013-09-23/act-2002-054</a>   |
| J    | Queensland Disaster Management Act 2003 — Current 01 July 2023                                      | <a href="https://www.legislation.qld.gov.au/view/pdf/inforce/curr/act-2003-091">https://www.legislation.qld.gov.au/view/pdf/inforce/curr/act-2003-091</a>   |
| K    | Queensland Emergency Alert Manual – M.1.174 (February 2022)   | <a href="https://www.disaster.qld.gov.au/dmg/Response/Pages/5-6.aspx">M.1.174 Queensland Emergency Alert Manual (disaster.qld.gov.au)</a>   |
| L    | Queensland Government Communications and systems for public information and warnings                | <a href="https://www.disaster.qld.gov.au/dmg/Response/Pages/5-6.aspx">https://www.disaster.qld.gov.au/dmg/Response/Pages/5-6.aspx</a>   |
| M    | Guidelines for the Development of Communication Education, Awareness and Engagement Programs (2010) | <a href="https://knowledge.aidr.org.au/media/1970/manual-45-guidelines-for-the-development-of-communication-education-awareness-and-engagement-programs.pdf">https://knowledge.aidr.org.au/media/1970/manual-45-guidelines-for-the-development-of-communication-education-awareness-and-engagement-programs.pdf</a> |
| N    | Sunwater (internal) Strategic Event Procedure   | <a href="#">Strategic Event Procedure</a>   |
| O    | Queensland State Disaster Management Plan 2018 (Queensland’s Disaster Management Committee)         | <a href="#">Queensland-State-Disaster-Management-Plan</a>   |
| P    | Queensland Disaster Management Guidelines   | <a href="https://www.disaster.qld.gov.au/dmg/Pages/DM-Guideline.aspx">https://www.disaster.qld.gov.au/dmg/Pages/DM-Guideline.aspx</a>   |
| Q    | Queensland Rainfall and River Conditions (BOM-Flood Warning)  | <a href="http://www.bom.gov.au/qld/flood/index.shtml?ref=hdr">http://www.bom.gov.au/qld/flood/index.shtml?ref=hdr</a>   |
| R    | Sunwater (internal) Emergency Alert Protocol  | <a href="#">eDOCS# 2156253</a>  |
| S    | Sunwater (internal) Moura Offstream Storage Operation and Maintenance Manual                        | <a href="#">Moura OS O&amp;M Manual</a>   |
| T    | Sunwater (internal) Moura Offstream Storage Safety Condition Schedule                               | <a href="#">eDOCS# 1740572</a>  |
| U    | Sunwater (internal) Moura Offstream Storage Failure Impact Assessment (FIA) 2017                    | <a href="#">eDOCS# 2219650</a>  |
| V    | Moura Off-stream Storage Comprehensive Risk Assessment (CRA) – August 2022                          | <a href="#">eDOCS# 2720007</a>  |
| W    | Fatigue Management Procedure WHS42 (Sunwater internal)  | <a href="#">Fatigue Management Procedure</a>  |
| X    | Sunwater (internal) Standing Operating Procedure (SOP) 12 – Dam Logbooks                            | <a href="#">Policies, Procedures and Guidelines - SOP12 Dam Log Books - All Documents - Default (Function and Activity) (sharepoint.com)</a>  |



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## 1.2 Abbreviations and acronyms

|         |   |      |   |
|---------|---|------|---|
| AEP     | Annual Exceedance Probability                           | OCDO | Operations Centre Duty Officer                              |
| AHD     | Australian Height Datum                                 | OCO  | Operations Coordinator                                      |
| AMTD    | Adopted Mean Thread Distance                            | OM   | Operator Maintainer   |
| ANCOLD  | Australian National Committee on Large Dams             | OMGR | Operations Manager  |
| AWS     | Australian Warning System                               | OS   | Operations Supervisor                                       |
| BOM     | Bureau of Meteorology                                   | ORR  | Owner's Regional Representative                             |
| CEO     | Chief Executive Officer                                 | PAR  | Population at Risk  |
| CRA     | Comprehensive Risk Assessment                           | PDSE | Principal Dam Safety Engineer                               |
| CTG     | Counter Terrorism Group                                 | PFRM | Predictive Flood Routing Model                              |
| D/S     | Downstream  | PLL  | Probable Loss of Life                                       |
| DCF     | Dam Crest Flood   | PMF  | Probable Maximum Flood                                      |
| DCL     | Dam Crest Level   | PMP  | Probable Maximum Precipitation                              |
| DDC     | District Disaster Coordinator                           | PMPF | Probable Maximum Precipitation Flood                        |
| DDMG    | District Disaster Management Group                      | PWRE | Principal Water Resources Engineer                          |
| DDMP    | District Disaster Management Plan                       | QDMC | Queensland Disaster Management Committee                    |
| DDO     | Dam Duty Officer  | QFD  | Queensland Fire Department                                  |
| DDS     | Director Dam Safety                                     | QPS  | Queensland Police Service                                   |
| DSR     | Dam Safety Regulator                                    | RB   | Right Bank  |
| DSSC    | Dam Safety Surveillance Coordinator                     | RC   | Regional Council  |
| DSTDM   | Dam Safety Technical Decision Maker                     | RCC  | Roller Compacted Concrete                                   |
| EAP     | Emergency Action Plan                                   | RDMW | Department of Regional Development, Manufacturing and Water |
| EA      | Emergency Alert   | ROC  | Regional Operations Centre                                  |
| EER     | Emergency Event Report                                  | RPEQ | Registered Professional Engineer of Queensland              |
| EGMO    | Executive General Manager Operations                    | RSL  | Reduced Supply Level  |
| EGME&WR | Executive General Manager Engineering & Water Resources | SCED | Senior Civil Engineer Dams                                  |
| EL      | Elevation Level   | SCTN | Security and Counter Terrorism Network                      |
| FCL     | Fixed Crest Level                                       | SDCC | State Disaster Coordination Centre                          |
| FODM    | Flood Operations Decision Maker                         | SDF  | Sunny Day Failure   |
| FSL     | Full Supply Level                                       | SDTE | Senior Dam Technical Engineer                               |
| GM      | General Manager   | SES  | State Emergency Service                                     |
| IC      | Incident Coordinator                                    | SMS  | Short Message Service                                       |
| IFHC    | Incremental Flood Hazard Category                       | SMT  | Sunwater Media Team   |
| IGEM    | Inspector-General Emergency Management                  | SO   | Standby Operator  |
| LB      | Left Bank   | SOP  | Standing Operating Procedure                                |
| LDC     | Local Disaster Coordinator                              | SRT  | Strategic Response Team                                     |
| LDMG    | Local Disaster Management Group                         | SS   | Storage Supervisor  |
| LDMP    | Local Disaster Management Plan                          | SWL  | Storage Water Level   |
| LEC     | Local Event Coordinator                                 | SWRE | Senior Water Resources Engineer                             |
| MAP     | Manager Asset Planning                                  | U/S  | Upstream  |
| Max. OL | Maximum Operating Level                                 | WHS  | Workplace Health & Safety                                   |
| ME      | Manager Environment                                     | WQ   | Water Quality   |
| MM      | Modified Mercalli                                       |      |   |
| O&M     | Operation & Maintenance                                 |      |   |
| OB      | Observation Bore  |      |   |
| OC      | Operations Centre                                       |      |   |

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### 1.3 Business terms and definitions

The meaning of terms used in this section are set out in accordance with relevant legislation or as defined by operator requirements.

| Term   | Definition   |
|--|--|
| <b>Terms defined with reference to the <i>Water Supply (Safety and Reliability) Act 2008</i> (ref G)</b> |  |
| Dam hazard   | Means a reasonably foreseeable situation or condition that may: <ul style="list-style-type: none"><li>• cause or contribute to the failure of the dam, if the failure may cause harm to persons or property, OR</li><li>• require an automatic or controlled release of water from the dam, if the release of the water may cause harm to persons or property.</li></ul>   |
| Dam hazard event   | Means an event arising from a <i>dam hazard</i> if: <ul style="list-style-type: none"><li>• persons or property may be harmed because of the event, AND</li><li>• a coordinated response, involving 2 or more of the following relevant entities, is unlikely to be required; each local group and district group for the EAP, each local government whose area may be affected, the Chief Executive, another entity the owner of the dam considers appropriate, AND</li><li>• the event is not an emergency event.</li></ul>  |
| Disaster Management Plan   | Of a <i>district group</i> or local government, means the group's or local government's disaster management plan under the Disaster Management Act.  |
| District group<br>(District Disaster Management Group)   | For an emergency action plan (EAP), means a district group established under the Disaster Management Act, section 22 whose disaster district under that Act could, under the plan, be affected by a <i>dam hazard</i> .  |
| Emergency event  | Means an event arising from a <i>dam hazard</i> if: <ul style="list-style-type: none"><li>• persons or property may be harmed because of the event, AND</li><li>• any of the following apply:<ul style="list-style-type: none"><li>○ a coordinated response, involving 2 or more of the following <i>relevant entities</i>, is likely to be required; each <i>local group</i> and <i>district group</i> for the EAP, each local government whose area may be affected, the Chief Executive, another entity the owner of the dam considers appropriate, OR</li><li>○ the event may arise because of a disaster situation declared under the Disaster Management Act, OR</li><li>○ an entity performing functions under the State <i>Disaster Management Plan</i> may, under that plan, require the owner of the dam to give the entity information about the event.</li></ul></li></ul> |
| Local group<br>(Local Disaster Management Group)   | For an EAP, means a local group established under the Disaster Management Act, section 29 whose local government area could, under the plan, be affected by a <i>dam hazard</i> .  |
| Notice response  | A dam owner's written response to a notice following an assessment of an EAP by a local government or <i>district group</i> .  |

## Moura — i8.2

| Term            | Definition  |
|-----------------|---|
| Referable dam   | <p>A dam, or a proposed dam after its construction, will be a referable dam if:</p> <ul style="list-style-type: none"> <li>• a failure impact assessment of the dam, or the proposed dam, is carried out under the Act, AND</li> <li>• 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</li> <li>• the Chief Executive has, under section 349 of the Act, accepted the assessment.</li> </ul> <p>Also, a dam is a referable dam if:</p> <ul style="list-style-type: none"> <li>• under section 342B of the Act, the owner of a dam is given a referable dam notice and, before the effective day for the notice, does not give the Chief Executive a failure impact assessment for the dam, AND</li> <li>• the Chief Executive has not, under section 349 of the Act, accepted a failure impact assessment of the dam.</li> </ul> |
| Relevant entity | <p>Means each of the following under the EAP for the dam:</p> <ul style="list-style-type: none"> <li>• the persons who may be affected, or whose property may be affected, if a dam hazard event or emergency event were to happen for the dam, e.g. the owners of parcels of farmland adjacent to the dam or residents of a township</li> <li>• each local group and district group for the EAP</li> <li>• each local government whose local government area may be affected if a dam hazard event or emergency event were to happen</li> <li>• the Chief Executive</li> <li>• another entity the owner of the dam considers appropriate e.g., the Queensland Police Service.</li> </ul>   |

### Terms consistent with *Queensland Disaster Management Guidelines*

|                   |  |
|-------------------|--|
| Activation levels | <p>The four levels of EAP activation are:</p> <ul style="list-style-type: none"> <li>• <b>Alert:</b> A heightened level of vigilance due to the possibility of an event occurring. No further action may be required; however, the situation should be monitored by someone capable of assessing the potential of the threat. Moving to an Alert level indicates the dam owner is getting ready to activate the Lean Forward level of the EAP if the situation deteriorates.</li> <li>• <b>Lean Forward:</b> An operational state characterised by a heightened level of situational awareness of an impending disaster event and a state of operational readiness. Disaster coordination centres are on standby and prepared but not activated.</li> <li>• <b>Stand Up:</b> The operational state where resources are mobilised, personnel are activated, and operational activities commenced. Disaster coordination centres are activated. The dam owner needs to provide an Emergency Event Report (EER) in accordance with the provision of the Act.</li> <li>• <b>Stand Down:</b> Transition from responding to an event back to normal core business and/or continuance of recovery operations. There is no longer a requirement to respond to the event and the threat is no longer present.</li> </ul> <p>The movement through these levels of activation is not necessarily sequential. It should be applied with flexibility and adaptability and be tailored to the location and event.</p> <p>Triggering one of these levels of activation may not necessarily mean a similar activation of LDMGs or DDMGs.</p> |
|-------------------|--|

## Moura — i8.2

| Term  | Definition  |
|---|---|
| Bureau of Meteorology flood level classifications | <p>The three levels of flooding are:</p> <ul style="list-style-type: none"> <li>• <b>Minor flooding:</b> This causes inconvenience such as closing of minor roads and the submergence of low-level bridges and makes the removal of pumps located adjacent to the river necessary.</li> <li>• <b>Moderate flooding:</b> This causes the inundation of low-lying areas requiring the removal of stock and/or the evacuation of some houses. Main traffic bridges may be closed by flood waters.</li> <li>• <b>Major flooding:</b> This causes inundation of large areas, isolating towns and cities. Major disruptions occur to road and rail links. Evacuation of many houses and business premises may be required. In rural areas widespread flooding of farmland is likely.</li> </ul> |
| Concurrent Flooding                               | Flood flows downstream of a dam that are not a result of dam outflows, for instance those from adjacent catchments or from the sea, and which occur in the same period as downstream releases or flooding from the dam.   |
| Dam crest   | The lowest elevation of the non-overflow crest section of the dam excluding handrails, parapets or wave walls that have not been designed to store water.   |
| Dam crest flood                                   | The flood event which, when routed through the reservoir, results in a still water reservoir level equivalent to the lowest dam crest level.  |
| Dam failure                                       | Dam failure is the physical collapse of all or part of a dam or the uncontrolled release of any of its contents.  |
| Downstream releases                               | Downstream releases are outflows from the dam made through appurtenant structures such as spillways or outlet works that are in accordance with the design of the dam.  |
| Earthquake  | <p>A sudden release of energy in the earth's crust or upper mantle, usually caused by movement along a fault plane or by volcanic activity, resulting in the generation of seismic waves that can be destructive. The potential consequences of an earthquake include:</p> <ul style="list-style-type: none"> <li>• settlement, sliding, or overturning of monoliths in the dam wall</li> <li>• initiation of seepage lines in the foundations or abutments that could lead to piping damage and potential inoperability of appurtenant works.</li> </ul>   |
| Flood release                                     | A flood release from a dam occurs when catchment inflows raise the storage level above the Full Supply Level (FSL) resulting in a discharge from the spillway of the dam.   |
| Piping  | Internal scour caused by the water flow and seepage that occurs through earth dams, dam foundations, or dam abutments. The internal scour can lead to the formation of a pipe, which can lead to a failure of the dam.  |
| Plane strike or other impact                      | The impact of a plane, meteorite, or other high energy item on or in close vicinity of a dam that could damage the dam structure or create a wave that could overtop the dam.   |
| Probable maximum flood                            | The flood resulting from the probable maximum precipitation coupled with the worst flood-producing catchment conditions that can be realistically expected in the prevailing meteorological conditions.   |
| Probable maximum precipitation                    | The theoretical greatest depth of precipitation for a given duration that is physically possible over a particular drainage basin.  |
| Probable maximum precipitation flood              | The flood resulting from the probable maximum precipitation coupled with typical catchment conditions.  |

## Moura — i8.2

| Term                       | Definition  |
|----------------------------|---|
| Stability, main embankment | High foundation pore pressure peaks may reduce the Factor of Safety against slip circle failure to an unacceptable level.         |
| 'Sunny day' failure        | 'Sunny day' dam failure is where the failure occurs at the full supply level and there is no concurrent rain associated flooding. |
| Terrorist activity         | A deliberate attempt to damage or fail or contaminate a dam.  |

**Note:** Sunwater has attempted to write the EAP to cope with all reasonably foreseeable emergency situations. However, there is considerable uncertainty about how any emergency might develop and progress. Factors such as the weather, the location, the mechanics, and the rate and size of any actual failure can considerably affect any resulting flood discharges. Therefore, a significant number of assumptions have had to be made in compiling sections of the EAP. Some variation in outcome should be expected where the event differs from the assumed behaviour.

## 2. Introduction

### 2.1 Context

Under the *Water Supply (Safety and Reliability) Act (2008)* (the Act, ref G), the owner of a referable dam must have an approved EAP for the dam. Referable dams, by definition, would put lives at risk if they were to fail.

This EAP has been prepared in accordance with Chapter 4 of the Act. The content requirements for EAPs are contained in section 352H of the Act.

#### Summary of legal requirements – Section 352H

Section 352H (1) of the Act requires that the EAP must identify each dam hazard for the dam; and for each of these dam hazard types (e.g. flood operations, earthquake):

1. identify the area likely to be affected by a dam hazard event or emergency event arising from the dam hazard; and
2. identify each circumstance that indicates a material increase in the likelihood of the dam hazard event or emergency event happening; and
3. state when and how the owner of the dam plans to warn persons who may be harmed, or whose property may be harmed by an event caused by the dam hazard, if one happens, and/or there is a material increase in the likelihood of an occurrence, including the order of priority in which the persons or categories of persons are to be warned; and
4. state when and how the owner plans to notify the relevant entities for the dam, if a dam hazard event or emergency event happens or, there is a material increase in the likelihood of such an occurrence, including the order of priority in which the relevant entities are to be notified; and
5. state the actions the owner of the dam plans to take in response to a dam hazard event or emergency event.

In accordance with section 352H (2) of the Act, the EAP may provide for the dam owner to make arrangements with a relevant entity for warnings to be given by the relevant entity on behalf of the dam owner in appropriate circumstances.

Section 352HA of the Act states that before giving the Chief Executive an EAP, the owner of the dam must give a copy of the plan to each local government whose area may be affected by a dam hazard identified in the plan, and each district group for the plan.

Section 352HB of the Act states that the local government must assess the EAP for consistency with its disaster management plan. In its assessment, the local government must consult with the local district group for the plan.

Within 30 business days of receiving the EAP, the local government must give the owner of the dam a notice, which states whether it considers the plan is consistent with its disaster management plan; and if not, give reason why it considers the EAP is not consistent. The EAP must include any such notices, provided to the owner of the dam by a local government (or district group); and any responses which the owner gives to these notices. Section 352H (1) further stipulates that an EAP must include any other relevant matter prescribed by regulation.

The local government whose area may be affected by a dam hazard for Moura Offsite Storage has been determined as **Banana Shire Council (BSC)**. Sunwater has provided the BSC with a copy of the draft EAP for assessment.

Section 352HC of the Act states that a district group may review the EAP for consistency with its disaster management plan. The district group for Moura Offsite Storage is **Gladstone District Disaster Management Group (DDMG)**. Sunwater has provided the DDMG with a copy of the draft EAP for review.

## 2.2 Purpose

The purpose of this EAP is:

- to minimise the risk of harm to persons or property if a dam hazard event or emergency event for the dam happens
- to identify dam hazards that could occur at Moura Offstream Storage and the area likely to be affected for each hazard.
- to prescribe emergency actions taken by the dam owners and operating personnel in identifying and responding to dam hazards and notifying relevant entities.

It is possible for more than one dam hazard to exist at Moura Offstream Storage at the one time. In such a circumstance, it may be necessary to act on the procedures within separate sections simultaneously.

The focus of this EAP is the management of dam hazards at Moura Offstream Storage by the owner of the dam (Sunwater) and the communication and notification of dam hazards to the LDMGs, DDMGs and broader community. However, the EAP sits within the broader emergency response framework. This EAP has been developed to be consistent with and support the objectives of the Banana Shire Council's Local Disaster Management Plan.

## 2.3 Scope

The Moura Offstream Storage EAP covers:

- dam hazards evaluated within Sunwater's Dam Safety Management Program
- details about the dam that are relevant to a dam hazard
- identification of circumstances that indicates a material increase in the likelihood of a dam hazard event and/or emergency event happening
- triggers for activation of a tiered response to dam hazard event and/or emergency event
- roles and responsibilities in responding to a dam hazard event and/or emergency event
- notification, warning, and communication protocols
- inspection, monitoring, and reporting protocols during emergencies
- other relevant information that may assist with identifying the area affected by a dam hazard event and/or emergency event, and the management of such.

## 2.4 Sunwater provides training

Training of the use and implementation of this EAP document is carried out at various times throughout the year, but specific pre-wet season training is undertaken in the months leading up to the wet season at each dam site.

During this time, Sunwater staff have work instructions for site preparations, and during July to September carry out checks on stores, supplies of fuel, on the current EAP such as contact details for individuals and dam information.

The EAP training that is carried out on-site includes walkthroughs of new changes, scenario (role play) and Q & A to check the knowledge and competency of all those who attended. This on-site training is presented to relevant Sunwater staff (DDOs, LECs, and ICs) and disaster management stakeholders. DSTDM information sessions are carried out once a year with the same walkthrough of new changes and Q & A, but this is not specific to any one dam. New employees to these various roles also undertake a walkthrough of the EAP to ensure understanding after they start work at Sunwater.

Sunwater is also working towards carrying out a full test once annually involving each local authority and disaster management stakeholders. Where there is more than one referable dam in a local area, the exercise could involve more than one dam, or the location will be rotated. This full test would involve the SDCC and include the (non-live) testing of emergency alerts. The test results relating to numbers of alerts generated will be shared with local authority and disaster management stakeholders.

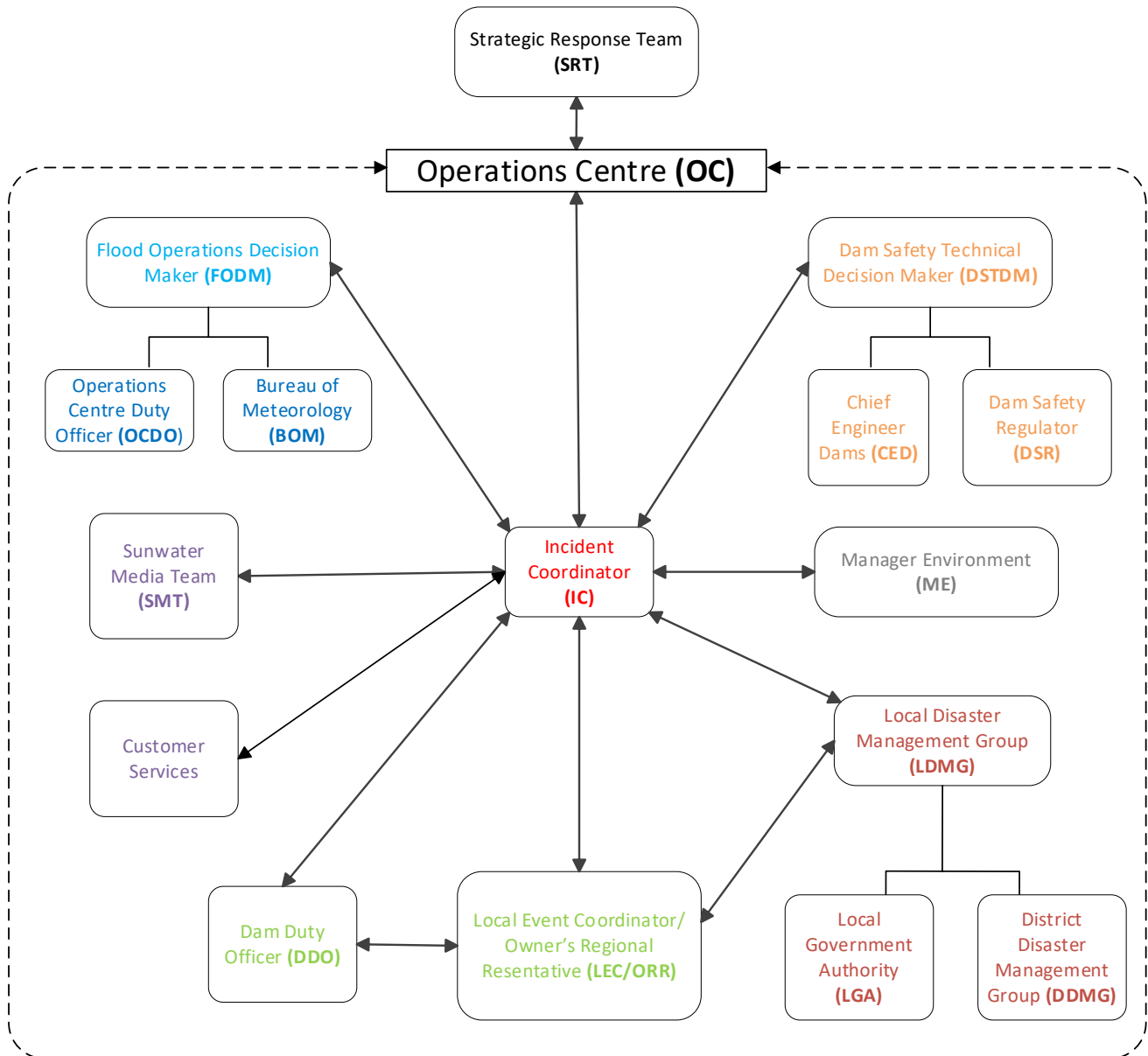
### 2.5 Fatigue Management Plan

Sunwater has a Fatigue Management Procedure (ref W). This document recognises fatigue as an important workplace hazard and has identified and outlined control processes to mitigate the risk of fatigue impaired HSE incidents. A copy of Sunwater's Fatigue Management Procedure can be provided upon request.

### 2.6 Dam emergency organisation within Sunwater

The Sunwater emergency management framework generally utilises the organisation's hierarchy and in-house experts as illustrated in Figure 1 below.

Figure 1: Sunwater emergency response organisation





## Moura — i8.2

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Key aspects of the emergency management framework are:

- Central to the framework is the role of Incident Coordinator (IC) for any dam hazard at a dam. The IC will maintain overall responsibility for coordination of the EAP when activated.
- The DSTDM is primarily responsible for analysing dam safety and providing expert technical advice in this regard. They will be expected to discuss dam hazards with peers and other technical experts and make sound decisions to mitigate risks and to determine a response to incidents and emerging issues. The DSTDM is the key communication contact with the Dam Safety Regulator.
- The FODM has responsibility for all matters involving flood modelling and forecasting and determining the associated impact to Sunwater storages/infrastructure and EAP actions. The FODM may pre-emptively advise the IC to activate the EAP in accordance with available hydrology forecast information. For example, if an EAP trigger level is predicted to be exceeded based on forecast dam inflows derived from observed rainfall and streamflow conditions upstream of the dam, the EAP may be activated to the predicted level. Regarding the operation of the OC, the FODM must liaise with the IC as necessary to inform of decisions made.
- The IC is responsible for the decision to activate the EAP. The IC is the lead coordinator in the implementation of any EAP in events for Sunwater. Should the IC be unavailable, the Local Event Coordinator (LEC) followed by the Dam Duty Officer (DDO) is responsible for the implementation of the EAP. If the IC loses all communications during a dam hazard, then as a fail-safe position, the LEC followed by the DDO will assume the duties and responsibility of the IC. However, loss of communications could result in some communication processes defined in this EAP not being carried out.
- The FODM and DSTDM roles are filled by Registered Professional Engineers of Queensland (RPEQ) and are suitably qualified professionals who are able to make engineering decisions and provide engineering decisions as defined in the Professional Engineers Act (Qld) (ref I).

### 2.7 Community information

Sunwater with the assistance of Banana Shire Council will ensure community education around messaging and impacts of the EAP and its related events is undertaken and continually improved by incorporating actions from Lessons Learnt (section 2.8).

Sunwater currently provides information externally to customers, downstream residents and the community in a range of ways or channels in relation to dam hazards and emergency situations. Individuals can access information through Facebook, Twitter, the Sunwater web page, the Sunwater App and at several regional show/field days across regional Queensland where Sunwater may have stalls and information available.

Immediate D/S residents of Moura Offstream Storage are also provided information in text message/phone calls in the event of an activation of this EAP.

In the event of an emergency event or when otherwise required, Sunwater and the affected local government also have the use of the National Emergency Alert System to send a voice message and SMS. This service is provided by Telstra and managed by the State Disaster Coordination Centre. The process Sunwater follows is documented in Appendix A7.

A copy of all Sunwater approved EAPs are available to the public on the Sunwater website:

<https://www.sunwater.com.au/community/preparing-for-emergencies/emergency-management/>

These copies are redacted to protect people's personal details.

### **2.8 Lessons learnt**

Sunwater carries out Lessons Learnt workshops as part of its post event management. These Lessons Learnt can result in changes to the EAP. These are captured and if applicable to this document are implemented at the earliest opportunity and are made available in the next EAP update to the regulator as part of Sunwater's continual improvement of its EAPs. The Lessons Learnt actions if relevant are provided to stakeholders, such as the LDMGs, DDMGs, other dam owners and RDMW as appropriate.

In addition, Sunwater requests any post event learnings be communicated regarding operational effectiveness and areas for improvement.

### **2.9 Downstream notifications lists**

Sunwater has compiled the notification lists through an iterative process. At least every five years, Sunwater writes to all lot on plan landholders that are impacted in the downstream zones. In addition to individual letters, advertisements are placed yearly in local papers to capture any new residents in the areas. All year, applicable individuals can register to receive notifications for this EAP and are able to register either through the Sunwater website or by calling Sunwater Customer Enquiries on 13 15 89.

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### 3. Dam details

#### 3.1 General dam information

**Location:** Moura Offstream Storage is situated approximately 8 km southwest of Moura and approximately 2 km from the right bank of Dawson River.

**Purpose:** Moura Offstream Storage was built to supplement the Moura Weir Pond, for the benefit of 'Queensland Nitrates Pty Ltd' who pumps from the weir. The storage is a part of a water harvesting system. This system conveys water from the Dawson River via a pumped rising main to an offstream storage in periods of high river flow or flood conditions, and returns the water under gravity, when required, during low flows in the river for distribution downstream via the river system.

**Construction:** The construction of Moura Offstream Storage was completed in January 1999. The spillway is an ungated, broad crested weir, with a grassed chute located on the right bank.

**Specification:** The table below lists general specifications of Moura Offstream Storage.

Table 2: Moura Offstream Storage specifications

| Description                  | Specification   |
|------------------------------|---|
| <b>Dam type</b>              | <b>Central core earth fill embankment</b>   |
| Full Supply Level (FSL)      | EL 125.29 m   |
| Embankment Crest Level (DCL) | EL 127.29 m (Design)<br>EL 127.08 m (2015 Survey – Appendix B)                          |
| Historical recorded storage  | N/A   |
| Storage capacity at FSL      | 2,820 ML  |
| Storage area at FSL          | 75 ha   |
| Catchment area               | 11.1 km <sup>2</sup>  |
| Max. embankment height       | 10.5 m  |
| Total length of dam          | 795 m   |
| Crest width                  | 3.5 m   |
| Spillway type                | Uncontrolled broad crest  |
| Spillway crest level         | EL 126.29 m   |
| Spillway crest length        | 50 m  |
| Spillway capacity (at DCF)   | 85 m <sup>3</sup> /s (7,344 ML/d)   |
| Dam Crest Flood (DCF)        |   |
| Spillway depth at DCF        | 1 m   |
| Outlet conduit               | Outlet pipe size: 750 mm, MSCL encased in concrete connected to 900 mm dia. rising main |
| Rising main                  | 2 x 660 mm MSCL at pump station, joining to 900 mm RC, length: 2,010 m                  |
| Return line                  | 10 m long 200 mm dia. DICL pipe and 6 m long 200 mm dia. UPVC pipe                      |

All levels are to Australian Height Datum (AHD).

Conversion for Moura Offstream Storage is AHD = State Datum + 0.093 m

### 3.2 Population at risk

The latest CRA (ref V) indicated the total PAR of Moura Offstream Storage under SDF scenario is 3 and the total PAR under flood failure conditions is 34. This classifies this storage as a 'Category 1' referable dam under the Water Act (2000, ref F) with a consequence category of 'Low' for SDF scenario and 'Significant' for flood failure scenario.

### 3.3 General arrangement

The general arrangement drawings are in Appendix B.

### 3.4 Emergency inspections and monitoring

The Moura Offstream Storage has been designed to conform to modern design standards, so that its failure is highly unlikely. To maintain the embankment in a safe condition and detect any dam hazards, as soon as it begins to develop, or becomes apparent, the following is applicable to Moura Offstream Storage.

#### 3.4.1 Inspections

The following inspections are to be carried out:

- **Routine Visual Inspection:** Conducted as per the ANCOLD guidelines or as directed by the DSTDM
- **Detailed Inspection:** Conducted annually
- **Comprehensive Inspection:** Conducted five-yearly

#### 3.4.2 Instrumentation and monitoring

A level sensor at the storage measures the storage level, and data is automatically relayed back to the Theodore Office. To confirm the structural behaviour and safety of the embankment, the following instrumentation was installed, and is monitored, at Moura Offstream Storage.

- **Settlement/movement measurement**
  - 5 surface settlement points along the axis and 3 survey control stations.

The instrumentation layout drawings are in Appendix B.

## 4. Roles and responsibilities

Table 3 Roles and Responsibilities

| Roles and responsibilities   | Position holder                           |
|--|---|
| <b>Owner</b> <ul style="list-style-type: none"> <li>• Liaise with the Board and Minister</li> <li>• Activate Sunwater Strategic Response and Business Continuity Plans if required</li> <li>• Ensure necessary resources are available to manage any event</li> <li>• Record communications, notifications and observations as required</li> </ul>   | CEO<br>EGMO<br>EGME&WR                    |
| <b>Owner's Head Office Representative</b> <ul style="list-style-type: none"> <li>• Authorise the issuing of EAPs, SOPs and O&amp;M Manuals and Amendments</li> <li>• Facilitate Dam Safety training courses for Service Managers, Operations Supervisor, Dam Operators and other staff as appropriate and ensure that all staff required to undertake dam safety work are trained and accredited.</li> <li>• Ensure that risks identified in CRAs, or other technical reports undertaken in relation to dam safety are included in the EAP</li> <li>• Ensure visual inspections and instrumentation monitoring frequencies conform to ANCOLD Guidelines</li> <li>• Ensure all dam safety work orders, work instructions and lesson learned outcomes are fully implemented.</li> <li>• Ensure requirements of the Dam Condition Schedule are met.</li> <li>• Ensure the work instructions are correct and the Logbooks, SOPs, Data Books, and EAPs are reviewed annually as per the Condition Schedule.</li> <li>• Undertake and prepare the five yearly Comprehensive Inspection Reports with suitably qualified personnel within the time specified in the Condition Schedule and that work orders are created for recommendations and work is undertaken as required.</li> <li>• Undertake annual inspections and prepare reports within the time frames specified in the Condition Schedule and that work orders are created for recommendations and work is undertaken as required.</li> <li>• Review the Dam Safety Instrumentation database and evaluate data to verify the structural integrity of the dams on a regular basis and maintain a spread sheet for verification for audit and quality control.</li> <li>• Record communications, notifications and observations as required.</li> </ul> | GM Asset Integrity<br>GM Asset Management |
| <b>Owner's Regional Representative (ORR)</b> <ul style="list-style-type: none"> <li>• Liaise with the Storage Supervisor/Operator Maintainer.</li> <li>• Arrange dam specific training and accreditation for relevant staff.</li> <li>• Ensure competent, trained and accredited personnel operate the storages.</li> <li>• Undertake the role of LEC as required.</li> <li>• Ensure all work orders, work instructions and lesson learned outcomes are fully implemented.</li> <li>• Record communications, notifications and observations as required.</li> </ul>  | GM Burnett & Lower<br>Mary<br>OCO<br>OS   |

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| Roles and responsibilities  | Position holder                            |
|---|--|
| <b>Technical Advisor</b> <ul style="list-style-type: none"> <li>Analyse the situation and provide expert technical advice.</li> <li>Discuss issue with peers and other technical experts and make sound decisions to mitigate the risk.</li> <li>Determine response to incidents and emerging issues.</li> <li>Record communications, notifications and observations as required.</li> </ul>  | GM Environment                             |
| <b>Dam Safety Technical Decision Maker (DSTDM)</b> <ul style="list-style-type: none"> <li>Maintain current RPEQ accreditation.</li> <li>Analyse the situation and provide expert technical advice in relation to dam safety.</li> <li>Discuss dam hazard with peers and other technical experts and make sound decisions to mitigate the risk.</li> <li>Determine response to incidents and emerging issues.</li> <li>Issue warning on dam failure and advise on protective measures.</li> <li>Ensure the EAP is implemented appropriately and carry out the DSTDM role as required.</li> <li>Liaise with Regulator as required.</li> <li>Record communications, notifications and observations as required.</li> </ul> | Various personnel as per DSTDM roster      |
| <b>Flood Operations Decision Maker (FODM)</b> <ul style="list-style-type: none"> <li>Maintain current RPEQ accreditation.</li> <li>Provide hydrological advice in relation to predicted and actual dam outflows including assessment of weather and flood warnings and other related matters as identified in the OC SOP.</li> <li>Interpret and apply rainfall data in accordance with the OC SOP, including, as required under the OC SOP, liaising with BOM.</li> <li>Ensure the EAP is implemented appropriately and carry out the FODM role as required.</li> <li>Record communications, notifications and observations as required.</li> </ul>  | Various personnel as per FODM roster       |
| <b>Operations Centre Duty Officer (OCDO)</b> <ul style="list-style-type: none"> <li>Decide if a flood is imminent and record modes of operation.</li> <li>Extract data relative to the event from available sources.</li> <li>Utilise this data in predictive flood models and determine results from these models for approval by FODM.</li> <li>Liaise with the FODM or IC to update current flood situation and routing data.</li> <li>Record communications, notifications and observations as required.</li> </ul>   | Various personnel as per OC roster         |
| <b>Sunwater Media Team (SMT)</b> <ul style="list-style-type: none"> <li>Analyse sensitive issues, discuss with the Owner and issue media releases.</li> <li>Handle public and customer comments (including social media) and advise the Owner if necessary.</li> <li>Liaise with the IC and update SDMG of flood events.</li> <li>Record communications, notifications and observations as required.</li> </ul>   | Various personnel as per Media Team roster |

## Moura — i8.2

| Roles and responsibilities   | Position holder                     |
|--|-------------------------------------|
| <b>Incident Coordinator (IC)</b> <ul style="list-style-type: none"> <li>• Notify LDMG/s, or council/s if LDMG not Stood Up, of intent to use the Emergency Alert (EA).</li> <li>• Activate the EAP.</li> <li>• Ensure the EAP is implemented appropriately and carry out the IC role as required.</li> <li>• Arrange situation reports and determine frequency, as required.</li> <li>• Record communications, notifications and observations as required.</li> </ul>  | Various personnel as per IC roster  |
| <b>Local Event Coordinator (LEC)</b> <ul style="list-style-type: none"> <li>• Liaise with the Local Disaster Coordinator or proxy.</li> <li>• Activate the EAP, when necessary.</li> <li>• Ensure the EAP is implemented appropriately and carry out the LEC role as required.</li> <li>• Record communications, notifications and observations as required.</li> </ul>  | Various personnel as per LEC roster |
| <b>Dam Duty Officer (DDO)</b> <ul style="list-style-type: none"> <li>• Complete accreditation to operate and maintain relevant storage.</li> <li>• Ensure the EAP is implemented appropriately and carry out the DDO role as required.</li> <li>• Take direction from the DSTDM and IC as requested.</li> <li>• Arrange immediate site inspection and make informed assessment of the situation.</li> <li>• Escalate any issue not covered in the EAP or where actions are not clear.</li> <li>• Record communications, notifications and observations as required.</li> </ul>   | SOM<br>SS<br>OM                     |
| <b>Banana Shire Council</b><br>Council has legislated local government functions, as per Section 80 of the Disaster Management Act (2003). These include: <ul style="list-style-type: none"> <li>• Ensure it has a disaster response capability.</li> <li>• Approve its Local Disaster Management plan.</li> <li>• Ensure information about an event or a disaster in its area is promptly given to the District Disaster Coordinator for the disaster district in which area it is situated.</li> <li>• Perform other functions given to the local government under the Act.</li> </ul> And as per Section 352HB of the Water Legislation (Dam Safety) Amendment Act (2017): <ul style="list-style-type: none"> <li>• Must assess (in consultation with its LDMG) the EAP for consistency with the Local Disaster Management Plan.</li> </ul> |                                     |

## Moura — i8.2

| Roles and responsibilities   | Position holder                    |
|--|------------------------------------|
| <p><b>Disaster Management Groups/Personnel</b> - (In addition to requirements outlined in the Disaster Management Act (2003)).</p> <p><b>LDMG</b></p> <ul style="list-style-type: none"> <li>As per IGEM review recommendation: work together with Sunwater and the Councils to ensure community education around messaging and impacts of EAP related events is undertaken and continually improves.</li> <li>Work with councils and Sunwater to ensure the EAP is regularly exercised.</li> <li>Identify and coordinate the use of resources and support services that may be required for an EAP event, noting that for safety events unique to the dam Sunwater will approach council to initiate.</li> <li>Identify and provide advice to DDMG about support services required by the LDMG to manage an EAP event.</li> <li>Provide reports and make recommendations to the relevant DDMG about matters relating to EAP events and any support required.</li> </ul> <p><b>QFD</b></p> <ul style="list-style-type: none"> <li>Work with dam owner and LDMG to ensure Emergency Alerts polygons are prepared, stored and tested at the State Watch Desk.</li> </ul> <p><b>DDMG</b></p> <ul style="list-style-type: none"> <li>May review EAP for consistency with the District Disaster Management Plan.</li> </ul> | <p>LDMG</p> <p>QFD</p> <p>DDMG</p> |
| <p><b>Dam Safety Regulator (DSR)</b></p> <ul style="list-style-type: none"> <li>Liaise with relevant Minister on necessary actions.</li> <li>Approve this document as required under legislation.</li> <li>Liaise with Chief Executive as required in administering (regulating) the Water Supply (Safety and Reliability) Act 2008.</li> </ul>  | <p>DDS</p>                         |



### 5. Dam hazard—flood operations

#### 5.1 Overview

The emergency action described in this section (Dam hazard—flood operations) relates to:

- A dam hazard where natural catchment inflows fill Moura Offstream Storage to Full Supply Level (FSL) 125.29m and the rate of inflow exceeds the capacity of the outlet works. The FIA (ref U) found that flooding downstream is likely to be confined to the gully to the north of the storage. The failure path breaches toward the northeast toward the Dawson Highway. For more information regarding the flood impact extent, refer to the maps in Appendix B of this EAP. These flood flows can create a dam hazard. Inflows will also cause the storage to temporarily rise to above the FSL of the storage. Note:
  - The greater the rate of inflow, the higher the storage will rise.
  - The higher the storage level rises, the greater the loads on the dam structure.
  - Although unlikely, the greater the loading, the higher the likelihood of a dam failure.

Typically, the level of surveillance is increased during flood operations (refer tables in this section).

- Spillway discharge from the dam where there have been no indications that a dam failure may be initiating or in progress.

The area likely to be affected by this emergency event is described as:

- As the rate of discharge increases, there will be an impact on low-level road crossings of Dawson River and other infrastructure in the river such as pump sites.

**Table 4 Historical floods experienced at Moura Offstream Storage**

| Flood rank | Date     | Peak height<br>EL (m) | Peak height<br>(m over spillway) |
|------------|----------|-----------------------|----------------------------------|
| 1          | Dec 2010 | 126.39                | 0.1                              |

## Moura — i8.2

### 5.2 Emergency actions

Regarding the emergency action tables in this section, each level of activation includes both its own actions and the actions of any lower level, unless those lower level actions are superseded.

#### 5.2.1 Activation triggers

Table 5: Flood emergency activation trigger summary

|                     |   |
|---------------------|---|
| <b>Alert</b>        | <ul style="list-style-type: none"><li>• EL 126.19m and rising<br/>(0.1 m below spillway crest level and rising)</li></ul>               |
| <b>Lean Forward</b> | <ul style="list-style-type: none"><li>• Storage above FSL 126.29m<br/>(spillway crest level)</li></ul>                                  |
| <b>Stand Up—1</b>   | <ul style="list-style-type: none"><li>• Storage above EL 126.39m<br/>(flood of record)</li></ul>  |
| <b>Stand Up—2</b>   | <ul style="list-style-type: none"><li>• Storage above EL 127.29m (allowing for Wave Action), OR</li><li>• As advised by DSTDM</li></ul> |
| <b>Stand Down</b>   | <ul style="list-style-type: none"><li>• Storage FSL 126.29m and falling with no forecast increase in EL</li></ul>                       |

While this EAP is not activated until Moura Offstream Storage reaches EL 126.19m, Sunwater and Banana Shire Council will work cooperatively and will endeavour to share intelligence of any rainfall event as and when either organisation becomes aware of a situation that could result in the activation of the EAP.

In respect of forecast rainfall, as is identified in the roles and responsibilities of the FODM, regard must be had to the OC SOP.

The activation of Stand Up 2 requires consideration of wave action. For example, if the gauge reading was forecast to reach 1 m below the dam crest level and the DDO reported 1 m high waves, Stand Up 2 will be triggered. Furthermore, the DSTDM may also trigger this activation if there are any dam safety concerns as the storage approaches dam crest level.

#### 5.2.2 Emergency action roles

Table 6 to Table 10 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).

Table 6: Flood operations—DDO emergency action

| Activation level              | Alert   | Lean Forward  | Stand Up—1  | Stand Up—2   | Stand Down   |
|-------------------------------|---|---|---|--|--|
| <b>Activation trigger</b>     | <ul style="list-style-type: none"> <li>EL 126.19 m (0.1 m below spillway crest level and rising)</li> </ul>   | <ul style="list-style-type: none"> <li>Storage above FSL 126.29 m (spillway crest level)</li> </ul>   | <ul style="list-style-type: none"> <li>Storage above EL 126.39 m (flood of record)</li> </ul>   | <ul style="list-style-type: none"> <li>Storage above EL 127.29m (allowing for Wave Action), OR</li> <li>As advised by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>Storage level FSL 126.29m and falling with no forecast increase in EL</li> </ul>  |
| <b>Actions</b>                | <ul style="list-style-type: none"> <li>Inspect the dam tri-weekly (or as instructed by the DSTDM), and photograph/video and record using approved forms and send to IC and DSTDM</li> <li>Monitor catchment conditions</li> <li>Record the storage level tri-weekly (or as instructed by the DSTDM) using gauge boards</li> <li>Record all communication and</li> <li>Logbook entries as per SOP 12</li> <li>Note: When storage level is above max. OL (FSL125.29) release water into the river through the return line until FSL is achieved</li> <li>Notify the SO (who will be available for duty for the duration of a flood or emergency event)</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Inspect the dam daily or as instructed by the DSTDM), and photograph/video and record using approved forms and send to IC and DSTDM. Attention will be given to:</li> <li>visual inspection of flow patterns over spillway and dissipater for evidence of scouring</li> <li>inspect embankment for leaks, deformation, and erosion</li> <li>obvious signs of seepage</li> <li>Report any unusual readings or observations to the DSTDM and IC as soon as practical</li> <li>Photograph spillway and DS face at regular intervals</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Remotely inspect the dam twice daily or as instructed by the DSTDM), and photograph/video and record using approved forms and send to IC and DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> <li></li> </ul>   | <ul style="list-style-type: none"> <li>Return to routine surveillance activities and frequencies—inspect the dam for any damage and photograph any damage identified</li> <li>Forward information for EER to IC email</li> <li>Update Dam Logbook as per SOP 12</li> </ul> |
| <b>Internal notifications</b> | <ul style="list-style-type: none"> <li>IC</li> <li>SO</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |
| <b>External notifications</b> | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 7: Flood operations—LEC emergency action

| Activation level       | Alert  | Lean Forward  | Stand Up—1  | Stand Up—2   | Stand Down  |
|------------------------|--|---|---|--|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>EL 126.19 m (0.1 m below spillway crest level and rising)</li> </ul>  | <ul style="list-style-type: none"> <li>Storage above FSL 126.29 m (spillway crest level)</li> </ul> | <ul style="list-style-type: none"> <li>Storage above EL 126.39 m (flood of record)</li> </ul> | <ul style="list-style-type: none"> <li>Storage above EL 127.29m (allowing for Wave Action), OR</li> <li>As advised by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>Storage level FSL 126.29m and falling with no forecast increase in EL</li> </ul>         |
| Actions                | <ul style="list-style-type: none"> <li>Liaise with LDMG re: situation</li> <li>Develop/implement staff roster</li> <li>Record all communication</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>                  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>IC</li> <li>DDO</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>                  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>                  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |



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**Table 8: Flood operations—IC emergency action**

| Activation level       | Alert  | Lean Forward   | Stand Up—1  | Stand Up—2   | Stand Down   |
|------------------------|--|--|---|--|--|
| Activation trigger     | <ul style="list-style-type: none"> <li>EL 126.19 m (0.1 m below spillway crest level and rising)</li> </ul>  | <ul style="list-style-type: none"> <li>Storage above FSL 126.29 m (spillway crest level)</li> </ul>  | <ul style="list-style-type: none"> <li>Storage above EL 126.39 m (flood of record)</li> </ul> | <ul style="list-style-type: none"> <li>Storage above EL 127.29m (allowing for Wave Action), OR</li> <li>As advised by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>Storage level FSL 126.29m and falling with no forecast increase in EL</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Liaise with Sunwater Customer Support to send SMS to D/S residents</li> <li>Obtain catchment conditions from the DDO</li> <li>Liaise with the DSTDM</li> <li>Record all communication</li> <li>Create Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> </ul> <div> <b>NOTE:</b> IC to carry out LEC actions unless LDMG is stood up         </div> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Ensure all abnormal observations or damage has been reported to DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Deactivate EAP</li> <li>Compile EER and deliver to DSR if required</li> <li>Close Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>DDO</li> <li>DSTDM</li> <li>LEC/ORR</li> <li>SMT</li> <li>SRT</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Inform previous notifications of deactivation as required</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>D/S Residents</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level,</li> </ul>           | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |



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e.g., taking photographs/video, dam inspections, instrument readings



Table 9: Flood operations—LEC and IC communication plan

| Activation level | Trigger for communications   | Group to contact   | Method   | Message text  |
|------------------|--|--|--|---|
| Alert            | <ul style="list-style-type: none"> <li>EL 126.19 m (0.1 m below spillway crest level and rising)</li> </ul>                            | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>  | <p>Describe current situation with dam—What is the event?<br/>What is the status?<br/>Advise of current storage level</p>   |
| Lean Forward     | <ul style="list-style-type: none"> <li>Storage above FSL 126.29 m (spillway crest level)</li> </ul>                                    | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>  | <p>Describe current situation with dam—What is the event?<br/>What is the status?<br/>Advise of current storage level<br/>EVENT: FLOOD<br/>STATUS: STORAGE SPILLING<br/>ACTION: STAY ALERT FOR FURTHER ADVICE</p> |
| Stand Up—1       | <ul style="list-style-type: none"> <li>Storage above EL 126.39 m (flood of record)</li> </ul>  | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>  | <p>Describe current situation with dam—What is the event?<br/>What is the status?<br/>Advise of current storage level<br/><b>Advise of any forecasts you are aware of</b></p>                                     |
|                  |  | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS</li> <li>(Phone for those without mobiles)</li> </ul> | <p>Liaise with Sunwater customer support and communications to send appropriate messaging via SMS</p>   |
| Stand Up—2       | <ul style="list-style-type: none"> <li>Storage above EL 127.29m (allowing for Wave Action), OR</li> <li>As advised by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>  | <p>Describe current situation with dam—What is the event?<br/>What is the status?<br/>Advise of current storage level<br/>Advise of any forecasts you are aware of</p>  |
|                  |  | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>                                | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                              | <p><b>Complete Emergency Alert Request Form as per instructions (copies in Appendix A7) and email to SDCC Watch Desk to send to D/S Residents.</b></p>  |
|                  |  | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS</li> <li>(Phone for those without mobiles)</li> </ul> | <p><b>Liaise with Sunwater customer support and communications to send appropriate messaging via SMS</b></p>  |
| Stand Down       | <ul style="list-style-type: none"> <li>Storage level FSL 126.29m and falling with no forecast increase in EL</li> </ul>                | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>  | <p>Describe current situation with dam—What is the event?<br/>What is the status?<br/>Advise of current storage level<br/>Advise EAP has been deactivated</p>   |
|                  |  | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS</li> <li>(Phone for those without mobiles)</li> </ul> | <p>Liaise with Sunwater customer support and communications to send appropriate messaging via SMS</p>   |

**Table 10: Flood operations—DSTDM emergency action**

| Activation level              | Alert   | Lean Forward  | Stand Up—1  | Stand Up—2   | Stand Down   |
|-------------------------------|---|---|---|--|--|
| <b>Activation trigger</b>     | <ul style="list-style-type: none"> <li>EL 126.19 m (0.1 m below spillway crest level and rising)</li> </ul>   | <ul style="list-style-type: none"> <li>Storage above FSL 126.29 m (spillway crest level)</li> </ul> | <ul style="list-style-type: none"> <li>Storage above EL 126.39 m (flood of record)</li> </ul> | <ul style="list-style-type: none"> <li>Storage above EL 127.29m (allowing for Wave Action), OR</li> <li>As advised by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>Storage level FSL 126.29m and falling with no forecast increase in EL</li> </ul>                  |
| <b>Action</b>                 | <ul style="list-style-type: none"> <li>Provide technical advice to DDO and IC on a needs basis</li> <li>Record all communication</li> <li>Review surveillance reports and determine if any additional responses are required</li> <li>Notify DSR</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>                  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Forward information for event report to IC email</li> <li>Return to routine activities</li> </ul> |
| <b>Internal notifications</b> | <ul style="list-style-type: none"> <li>DDO</li> <li>IC</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>                  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>CEO—if time permits</li> </ul>                   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |
| <b>External notifications</b> | <ul style="list-style-type: none"> <li>DSR</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>                  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>            | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |



**ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO**  
e.g., taking photographs/video, dam inspections, instrument readings



## 6. Dam hazard—piping: embankment, foundation, or abutments

### 6.1 Overview

The emergency action described in this section relates to a potential dam hazard due to a piping condition through the embankment (Main Dam or Saddle Dams), foundations, or dam abutment. An early indicator of a piping condition can be an increase in seepage or a new area of seepage. If the seepage water is cloudy or has become cloudy, this may indicate that material is being transported and a pipe is being established.

If a pipe is established and progresses, then a dam failure may result. If a potential pipe is detected early, remedial repairs may be possible in the form of constructing a filter and weighting zone over the pipe exit if safe to do so.

The flood outlines in Appendix B are there to provide indicative outlines of the maximum potentially affected area of a dam hazard caused by piping. The use of these flood outlines is prescribed below:

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to piping and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to piping and concurrent flooding or downstream releases are occurring or expected to occur.

**Notes:** Definitions for *Concurrent Flooding* and *Downstream Releases* are provided in Section 1.3

#### 6.1.1 Assessment of circumstances that indicates an increase in the likelihood of piping.

An increase in seepage or a new area of seepage is a circumstance that could indicate an increased likelihood of piping. This circumstance is the trigger for the alert status for piping.

Cloudy seepage water is a circumstance that could indicate an increased likelihood of piping. This circumstance is the trigger for the lean forward status for piping.

### 6.2 Emergency action roles

Table 11 to Table 15 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).



Figure 2: Piping: embankment, foundation, or abutments flowchart

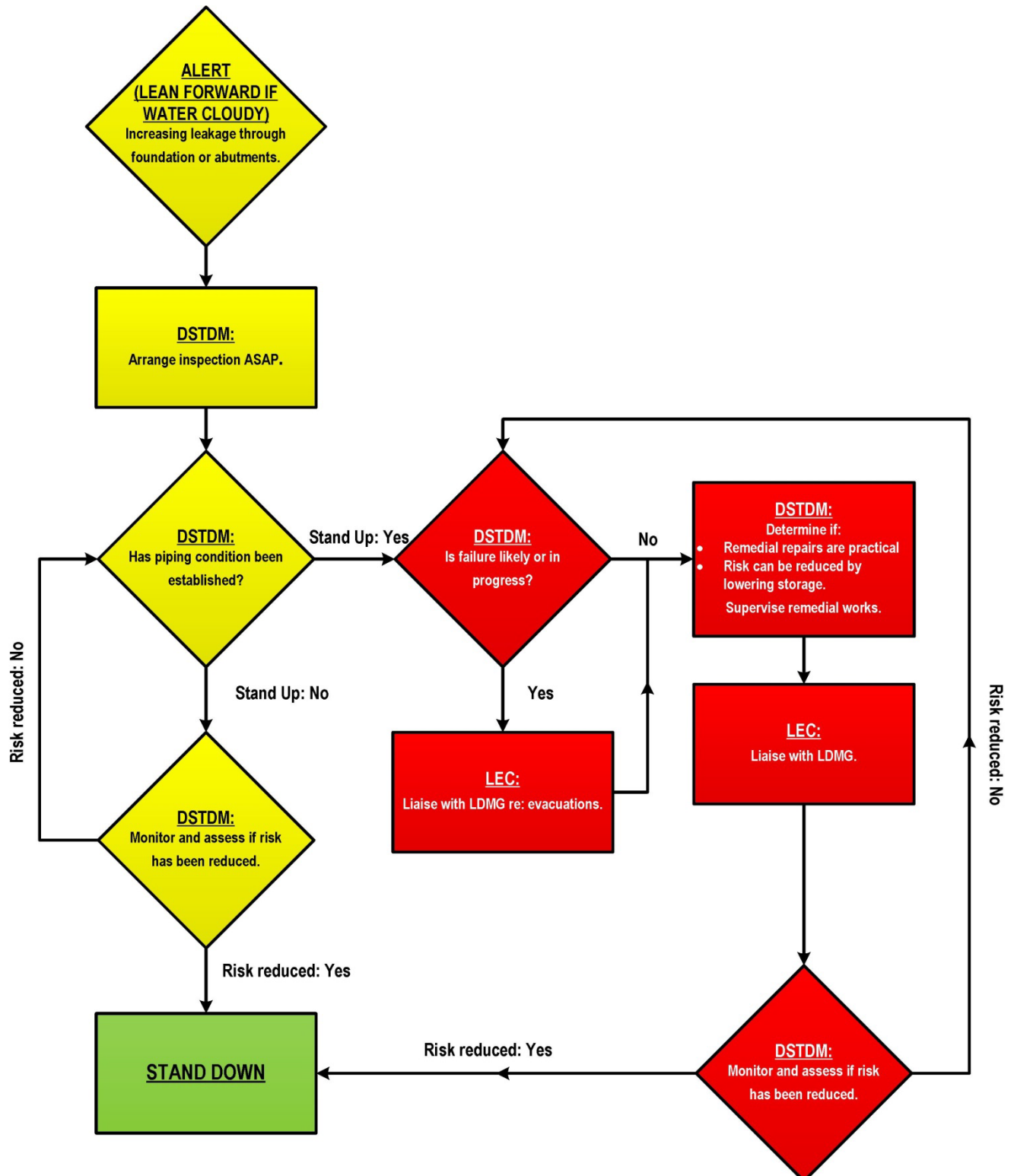


Table 11: Piping: embankment, foundation, or abutments—DDO emergency action

| Activation level              | Alert   | Lean Forward   | Stand Up—1   | Stand Up—2  | Stand Down  |
|-------------------------------|---|--|--|---|---|
| <b>Activation trigger</b>     | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments</li> </ul>  | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments with cloudy water</li> </ul> | <ul style="list-style-type: none"> <li>Piping condition has been established</li> </ul>  | <ul style="list-style-type: none"> <li>Failure in progress or likely due to piping, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul>  | <ul style="list-style-type: none"> <li>Risk assessment has determined that piping risk has reduced</li> </ul>   |
| <b>Actions</b>                | <ul style="list-style-type: none"> <li>Monitor flows every 6 hours or until a decreasing trend is observable, or as directed by the DSTDM</li> <li>Photograph/video the piping from a safe point and record using the approved forms and send to IC and DSTDM</li> <li>Notify SO</li> <li>Update Dam Logbook as per SOP 12</li> <li>Record all communication</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Support/supervise remedial works as required</li> <li>Lower the storage if directed</li> <li>Close any affected roads if not already closed by others</li> <li>Maintain surveillance of area immediately downstream of dam (if safe to do so) and move on any members of the public</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Vacate the immediate vicinity of the piping condition</li> <li>Ensure remedial works cease and plant and personnel have been moved to a safe location</li> <li>Record/ photograph the piping damage and/or dam failure from a safe point</li> </ul> | <ul style="list-style-type: none"> <li>Forward information for event report to IC</li> <li>Return to routine activities</li> <li>Update Dam Logbook as per SOP12</li> </ul> |
| <b>Internal notifications</b> | <ul style="list-style-type: none"> <li>DSTDM</li> <li>IC</li> <li>SO</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| <b>External notifications</b> | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



**Table 12: Piping: embankment, foundation, or abutments—LEC emergency action**

| Activation level              | Alert  | Lean Forward   | Stand Up—1  | Stand Up—2   | Stand Down  |
|-------------------------------|--|--|---|--|---|
| <b>Activation trigger</b>     | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments</li> </ul> | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments with cloudy water</li> </ul> | <ul style="list-style-type: none"> <li>Piping condition has been established</li> </ul>   | <ul style="list-style-type: none"> <li>Failure in progress or likely due to piping, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has determined that piping risk has reduced</li> </ul>                   |
| <b>Actions</b>                | <ul style="list-style-type: none"> <li>Liaise with DDO and IC re: situation</li> <li>Record all communication</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with relevant council(s) regarding potential road/bridge closures</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| <b>Internal notifications</b> | <ul style="list-style-type: none"> <li>IC</li> <li>DDO</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| <b>External notifications</b> | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |



**ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO**  
e.g., taking photographs/video, dam inspections, instrument readings



Table 13: Piping: embankment, foundation, or abutments—IC emergency action

| Activation level       | Alert   | Lean Forward   | Stand Up—1   | Stand Up—2   | Stand Down   |
|------------------------|---|--|--|--|--|
| Activation trigger     | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments</li> </ul>  | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments with cloudy water</li> </ul>   | <ul style="list-style-type: none"> <li>Piping condition has been established</li> </ul>  | <ul style="list-style-type: none"> <li>Failure in progress or likely due to piping, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul>   | <ul style="list-style-type: none"> <li>Risk assessment has determined that piping risk has reduced</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Liaise with DSTDM, DDO &amp; LEC re: situation</li> <li>Create Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> <li>Record all communication</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>NOTE:</b> IC to carry out LEC actions unless LDMG is <i>Stood Up</i> </div> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Investigate availability of machinery and materials (if insufficient stockpiles available)</li> <li>Place machinery operators on standby if directed by DSTDM</li> <li>Consider the need to appoint a Recovery Coordinator. The Recovery Coordinator is then responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over.</li> <li>Confirm EAs and other messages are prepared in advance – if required.</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Mobilise resources to undertake remedial works if directed by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> <li>Liaise with the DSTDM to confirm that dam failure is in progress</li> <li>Confirm that remedial works have ceased if directed by the DSTDM and plant and personnel have been moved to a safe location</li> <li>Liaise with DDO and DSTDM re: potential for evacuations</li> </ul> | <ul style="list-style-type: none"> <li>Deactivate EAP Event</li> <li>Compile EER and deliver to DSR if required</li> <li>Close Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>DSTDM</li> <li>DDO</li> <li>LEC/ORR</li> <li>SMT</li> <li>SRT</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Inform previous notifications of deactivation as required</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>DDMG</li> </ul>  | <ul style="list-style-type: none"> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>D/S residents</li> <li>SDCC Watch Desk</li> </ul>                              | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |



**ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO**  
e.g., taking photographs/video, dam inspections, instrument readings

Table 14: Piping: embankment, foundation, or abutments—LEC and IC communication plan

| Activation level | Trigger for communications  | Group to contact   | Method  | Message text   |
|------------------|---|--|---|--|
| Alert            | <ul style="list-style-type: none"> <li>Increasing leakage through an embankment, the foundations, or abutments</li> </ul>                   | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                 | Describe current situation with dam—What is the event? ( <i>Unconfirmed piping risk</i> )<br>What is the status? (Unconfirmed leakage—investigation continues)<br>Advise of current storage level<br>Advise any issues you are aware of<br>Standby for further advice                              |
| Lean Forward     | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations or abutments with cloudy water</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                 | Describe current situation with dam—What is the event? ( <i>Unconfirmed piping risk</i> )<br>What is the status? (Unconfirmed leakage - investigation continues)<br>Advise of current storage level<br>Advise any issues you are aware of<br>Standby for further advice                            |
| Stand Up—1       | <ul style="list-style-type: none"> <li>Piping condition has been established</li> </ul>   | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                 | Describe current situation with dam—What is the event? ( <i>Confirmed piping risk</i> )<br>What is the status? (Confirmed piping/leakage)<br>Advise of current storage level<br>Advise any issues you are aware of. Discuss any potential road/bridge closures<br>Prepare for possible evacuations |
|                  |   | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>                                | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                     | Complete Emergency Alert Request Form as per instructions and email to SDCC Watch Desk to send.<br>Develop messages in consultation with DSTDM   |
|                  |   | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS (Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
 e.g., taking photographs/video, dam inspections, instrument readings



Table 14 (Continued): Piping: embankment, foundation, or abutments—LEC and IC communication plan

| Activation level | Trigger for communications  | Group to contact  | Method                                     | Message text  |
|------------------|---|---|--|---|
| Stand Up—2       | <ul style="list-style-type: none"> <li>Failure likely due to piping, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul>  | • Phone                                    | Describe current situation with dam—What is the event? ( <i>Confirmed piping risk</i> )<br>What is the status? (Possible Dam Failure)<br>Advise of current storage level<br>Prepare coordinated evacuations   |
|                  |   | • SDCC Watch Desk   | • Phone & Email                            | Complete Emergency Alert Request Form as per instructions and email to SDCC Watch Desk to send.<br>Develop messages in consultation with DSTDM  |
|                  |   | • D/S Residents   | • SMS<br>(Phone for those without mobiles) | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS  |
|                  | <ul style="list-style-type: none"> <li>Dam failure in progress</li> </ul>   | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul>  | • Phone                                    | Describe current situation with dam—What is the event? ( <i>Confirmed piping risk</i> )<br>What is the status? (Dam Failure In Progress)<br>Advise of current storage level<br>Coordinate evacuations of affected Downstream Residents and move people to higher ground |
|                  |   | • SDCC Watch Desk   | • Phone & Email                            | Complete Emergency Alert Request Form as per instructions (copies in Appendix A7) and email to SDCC Watch Desk to send.   |
| Stand Down       | <ul style="list-style-type: none"> <li>Risk assessment has determined that piping risk has reduced</li> </ul>                                   | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG)</li> </ul> | • Phone                                    | Describe current situation with dam—What is the event? ( <i>Dam Safety Risk—piping</i> )<br>What is the status? (Dam hazard Stood Down)<br>Advise risk assessment has determined that piping risk has reduced, and EAP has been deactivated.                            |
|                  |   | • D/S Residents   | • SMS<br>(Phone for those without mobiles) | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS  |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 15: Piping: embankment, foundation, or abutments—DSTDM emergency action

| Activation level       | Alert  | Lean Forward   | Stand Up—1  | Stand Up—2  | Stand Down  |
|------------------------|--|--|---|---|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments</li> </ul>   | <ul style="list-style-type: none"> <li>Increasing leakage through the embankment, the foundations, or abutments with cloudy water</li> </ul> | <ul style="list-style-type: none"> <li>Piping condition has been established</li> </ul>   | <ul style="list-style-type: none"> <li>Failure in progress or likely due to piping, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul>  | <ul style="list-style-type: none"> <li>Risk assessment has determined that piping risk has reduced</li> </ul>                   |
| Action                 | <ul style="list-style-type: none"> <li>Arrange an inspection of the dam to assess its condition as soon as possible, when safe to do so</li> <li>Determine if piping condition has been established</li> <li>Monitor situation and assess risks</li> <li>Record all communication</li> <li>Advise DSR on EAP activation</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Assess risk and determine if failure likely or in progress</li> <li>Liaise with the DDO &amp; IC</li> <li>Determine if remedial repairs are practical</li> <li>Determine if risks can be reduced by lowering storage.</li> <li>Supervise* remedial repairs (if applicable)</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with the IC and advise on need to recommend evacuations</li> </ul> | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>DDO</li> <li>IC</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>CEO—if time permits</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| External notification  | <ul style="list-style-type: none"> <li>DSR</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |

\* Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision.



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



## 7. Dam hazard—earthquake

### 7.1 Overview

The emergency action described in this section relates to a potential dam hazard due to an earthquake causing damage to the dam embankment (Main Dam or Saddle Dams), foundations, or dam abutment. Damage could take the form of cracking or slumping of the embankment, deformation or land slip, or increased seepage.

If damage does occur, then a dam failure may result. If damage is detected early, remedial repairs may be possible depending on the nature of the damage.

The flood outlines in Appendix B are there to provide indicative outlines of the maximum potentially affected area of a dam hazard caused by earthquake damage. The use of these flood outlines is prescribed below:

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to earthquake damage and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to earthquake damage and concurrent flooding or downstream releases are occurring or expected to occur.

**Note:** Definitions for *Concurrent Flooding* and *Downstream Releases* are provided in Section 1.3

### 7.2 Emergency action roles

Table 16 to Table 20 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).



Figure 3: Earthquake flowchart

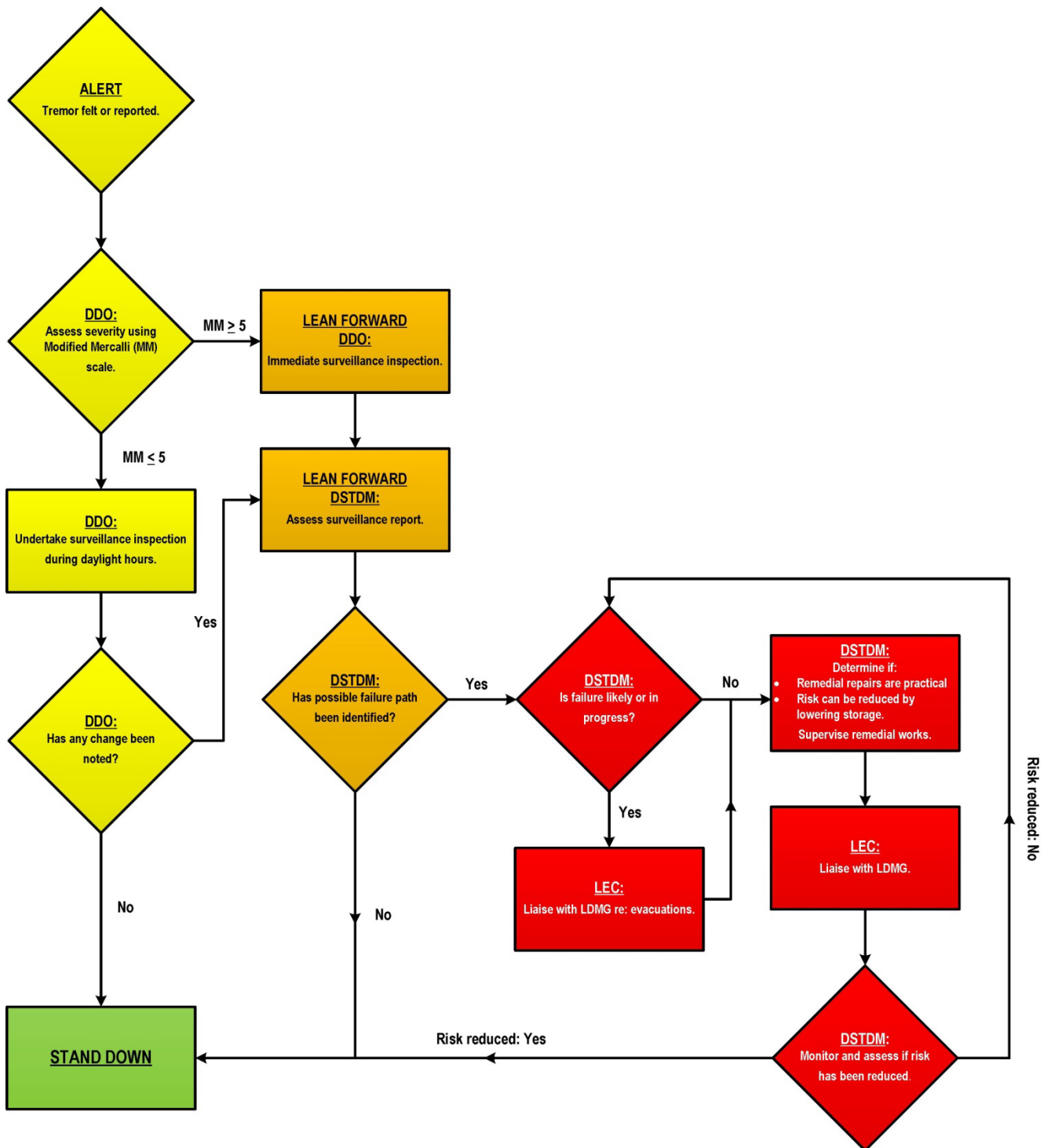


Table 16: Earthquake—DDO emergency action

| Activation level       | Alert   | Lean Forward   | Stand Up—1   | Stand Up—2   | Stand Down   |
|------------------------|---|--|--|--|--|
| Activation trigger     | <ul style="list-style-type: none"> <li>Earthquake confirmed (by DSTDM) or felt in the area, AND</li> <li>Intensity less than 5MM~</li> </ul>  | <ul style="list-style-type: none"> <li>Earthquake confirmed (by DSTDM) or felt in the area, AND</li> <li>Intensity greater than or equal to 5MM~, OR</li> <li>Intensity less than 5MM~ and change detected during surveillance inspection</li> </ul>   | <ul style="list-style-type: none"> <li>Earthquake confirmed (by DSTDM) or felt in the area, AND</li> <li>A possible failure path has been identified</li> </ul>  | <ul style="list-style-type: none"> <li>Failure in progress or likely due to earthquake, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul>   | <ul style="list-style-type: none"> <li>Risk assessment has been determined that failure risk has reduced</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Inspect the dam wall, spillway structure, and abutments in daylight hours (if safe to do so); photograph/video and record using the approved forms and send to IC and DSTDM</li> <li>Check for leaks, deformation, erosion, and concrete damage</li> <li>Notify SO</li> <li>Update Dam Logbook as per SOP12</li> <li>Record all communication</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Unless completed in Alert Stage, immediately inspect the dam wall, spillway structure, and abutments (if safe to do so); photograph/video and record using the approved forms and send to IC and DSTDM</li> <li>Repeat the inspection as directed</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Support/supervise remedial work as required</li> <li>Lower the storage if directed</li> <li>Close any affected roads, if not already closed by others</li> <li>Maintain surveillance of area immediately downstream of dam or Saddle Dams (if safe to do so) and move on any members of the public</li> <li>Record/photograph the damage from a safe point</li> <li>Vacate the immediate vicinity of the embankment</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> <li>Ensure remedial works cease and plant and personnel have been moved to a safe location</li> <li>Record/photograph the earthquake damage and/or dam failure from a safe point</li> </ul> | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Update Dam Logbook as per SOP12</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>DSTDM</li> <li>IC</li> <li>LEC</li> <li>SO</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |
| External notifications | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |

~ DDO to assess magnitude (MM scale) at dam location.



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



**Table 17: Earthquake—LEC emergency action**

| Activation level       | Alert  | Lean Forward   | Stand Up—1  | Stand Up—2   | Stand Down  |
|------------------------|--|--|---|--|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Earthquake confirmed (by DSTDM) or felt in the area, AND</li> <li>Intensity less than 5MM~</li> </ul> | <ul style="list-style-type: none"> <li>Earthquake confirmed (by DSTDM) or felt in the area, AND</li> <li>Intensity greater than or equal to 5MM~, OR</li> <li>Intensity less than 5MM~ and change detected during surveillance inspection</li> </ul> | <ul style="list-style-type: none"> <li>Earthquake confirmed (by DSTDM) or felt in the area, AND</li> <li>A possible failure path has been identified</li> </ul>                   | <ul style="list-style-type: none"> <li>Failure in progress or likely due to earthquake, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has been determined that failure risk has reduced</li> </ul>             |
| Actions                | <ul style="list-style-type: none"> <li>Liaise with DDO and IC re: situation</li> <li>Record all communication</li> </ul>                     | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with LDMG re: situation</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with DDO and relevant Council(s) regarding potential road/bridge closures</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>IC</li> <li>DDO</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |

~ DDO to assess magnitude (MM scale) at dam location.



**ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO**  
e.g., taking photographs/video, dam inspections, instrument readings



**Table 18: Earthquake—IC emergency action**

| Activation level       | Alert  | Lean Forward   | Stand Up—1   | Stand Up—2  | Stand Down   |
|------------------------|--|--|--|---|--|
| Activation trigger     | <ul style="list-style-type: none"> <li>Earthquake confirmed* (by DSTDM) or felt in the area, AND</li> <li>Intensity less than 5MM~</li> </ul>  | <ul style="list-style-type: none"> <li>Earthquake confirmed* (by DSTDM) or felt in the area, AND</li> <li>Intensity greater than or equal to 5MM~, OR</li> <li>Intensity less than 5MM~ and change detected during surveillance inspection</li> </ul>          | <ul style="list-style-type: none"> <li>Earthquake confirmed* (by DSTDM) or felt in the area, AND</li> <li>A possible failure path has been identified</li> </ul>     | <ul style="list-style-type: none"> <li>Failure in progress or likely due to earthquake, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul>  | <ul style="list-style-type: none"> <li>Risk assessment has been determined that failure risk has reduced</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Liaise with DDO, DSTDM &amp; LEC re: situation</li> <li>Record all communication</li> <li>Create Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> IC to carry out LEC actions unless LDMG is <i>Stood Up</i></p> </div> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Investigate availability of machinery and materials (if insufficient stockpiles available)</li> <li>Place machinery operators on standby if directed by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Mobilise resources to undertake remedial works if directed by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with the DSTDM to confirm that dam failure is in progress</li> <li>Confirm that remedial works have ceased if directed by the DSTDM and plant and personnel have been moved to a safe location</li> <li>Liaise with DDO and DSTDM re: potential for evacuations</li> </ul> | <ul style="list-style-type: none"> <li>Deactivate EAP</li> <li>Compile EER and deliver to the DSR if required</li> <li>Close Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>DDO</li> <li>DSTDM</li> <li>LEC/ORR</li> <li>SMT</li> <li>SRT</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>Inform previous notifications of deactivation as required</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>As required</li> </ul>  | <ul style="list-style-type: none"> <li>D/S Residents</li> <li>SDCC Watch Desk</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul>                                   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |

~ DDO to assess magnitude (MM scale) at dam location

\* 'Confirmed' is defined as an alert received from Geoscience Australia or other source that advises an Earthquake >4.9 ML (Richter Scale) has occurred within a 200km radius of the Dam



**ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO**  
e.g., taking photographs/video, dam inspections, instrument readings



Table 19: Earthquake—LEC and IC communication plan

| Activation level | Trigger for communications   | Group to contact   | Method  | Message text  |
|------------------|--|--|---|---|
| Alert            | <ul style="list-style-type: none"> <li>Earthquake reported or felt in the area, AND</li> <li>Intensity less than 5MM</li> </ul>  | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | <p>Describe current situation with dam—What is the event? (Dam Safety Risk—Earthquake damage)</p> <p>What is the status? (Under investigation)</p> <p>Advise current storage level</p> <p>Stand by for further information</p>  |
| Lean Forward     | <ul style="list-style-type: none"> <li>Earthquake reported or felt in the area, AND</li> <li>Intensity greater than or equal to 5MM, OR</li> <li>Intensity less than 5MM and change detected during surveillance inspection</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | <p>Describe current situation with dam—What is the event? (Dam Safety Risk—Earthquake damage)</p> <p>What is the status? (Under investigation)</p> <p>Advise current storage level</p> <p>Stand by for further information</p>  |
|                  |  | Send Sunwater Incident and Near Miss Report  |   | EAP Alert Notification—Moura OS—Earthquake reported in area   |
| Stand Up—1       | <ul style="list-style-type: none"> <li>Earthquake reported or felt in the area, AND</li> <li>A possible failure path has been identified</li> </ul>  | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | <p>Describe current situation with dam—What is the event? (Dam Safety Risk—Earthquake felt or reported in area)</p> <p>What is the status? (Possible earthquake damage to dam)</p> <p>Advise of current storage level. Discuss any potential road/ bridge closures</p> <p>Activate emergency response</p> |
|                  |  | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>                                | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                         | <p>Complete Emergency Alert Request Form as per instructions and email to SDCC Watch Desk to send.</p> <p>Develop messages in consultation with DSTDM</p>   |
|                  |  | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS<br/>(Phone for those without mobiles)</li> </ul> | <p>Liaise with Sunwater customer support and communications to send appropriate messaging via SMS</p>   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 19 (Continued): Earthquake—LEC and IC communication plan

| Activation level | Trigger for communications  | Group to contact   | Method  | Message text  |
|------------------|---|--|---|---|
| Stand Up—2       | <ul style="list-style-type: none"> <li>Failure likely due to earthquake, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | Describe current situation with dam—What is the event? ( <i>Dam Safety Risk—Earthquake damage</i> )<br>What is the status? (Dam Failure Likely)<br>Advise of current storage level. Discuss any potential road/bridge closures (if not discussed at Stand Up—1)<br>Prepare coordinated evacuation |
|                  |   | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>                                | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                         | Complete Emergency Alert Request Form as per instructions and email to SDCC Watch Desk to send.<br>Develop messages in consultation with DSTDM  |
|                  |   | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS<br/>(Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS  |
|                  | <ul style="list-style-type: none"> <li>Dam failure in progress</li> </ul>   | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | Describe current situation with dam—What is the event? ( <i>Dam Safety Risk—Earthquake damage</i> )<br>What is the status? (Dam Failure In Progress)<br>Advise of current storage level<br>Coordinate evacuation of Downstream Residents and move people to higher ground                         |
|                  |   | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>                                | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                         | Complete Emergency Alert Request Form as per instructions (copies in Appendix A7) and email to SDCC Watch Desk to send.<br>.  |
|                  |   | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS<br/>(Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS  |
| Stand Down       | <ul style="list-style-type: none"> <li>Risk assessment has been determined that failure risk has reduced</li> </ul>                                 | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | Describe current situation with dam—What is the event? ( <i>Dam Safety Risk—Earthquake damage</i> )<br>What is the status? (Dam hazard Stood Down)<br>Advise risk assessment has been determined, that failure risk has reduced, and that EAP has been deactivated                                |
|                  |   | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS<br/>(Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS  |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 20: Earthquake—DSTDM emergency action

| Activation level       | Alert  | Lean Forward  | Stand Up—1  | Stand Up—2   | Stand Down  |
|------------------------|--|---|---|--|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Earthquake confirmed* or felt in the area, AND</li> <li>Intensity less than 5MM~</li> </ul>   | <ul style="list-style-type: none"> <li>Earthquake confirmed* or felt in the area, AND</li> <li>Intensity greater than or equal to 5MM~, OR</li> <li>Intensity less than 5MM~ and change detected during surveillance inspection</li> </ul>                              | <ul style="list-style-type: none"> <li>Earthquake confirmed* or felt in the area, AND</li> <li>A possible failure path has been identified</li> </ul>   | <ul style="list-style-type: none"> <li>Failure in progress or likely due to earthquake, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has been determined that failure risk has reduced</li> </ul>             |
| Action                 | <ul style="list-style-type: none"> <li>Monitor situation and assess risks</li> <li>Liaise with DDO &amp; IC</li> <li>Record all communication</li> <li>Advise DSR of EAP activation</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Review surveillance inspection of the dam and assess its condition as soon as possible</li> <li>Determine if there are any possible failure paths from reported damage</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Arrange an inspection of the dam and assess its condition as soon as possible, when safe to do so</li> <li>Assess risk and determine if failure likely or in progress</li> <li>Determine if remedial repairs are practical</li> <li>Determine if risks can be reduced by lowering storage</li> <li>Supervise^ remedial repairs (if applicable)</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>DDO</li> <li>IC</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>CEO—if time permits</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>   |
| External notification  | <ul style="list-style-type: none"> <li>DSR</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>   |

~DDO to assess magnitude (MM scale) at dam location

\* ‘Confirmed’ is defined as an alert received from Geoscience Australia or other source that advises an Earthquake >4.9 ML (Richter Scale) has occurred within a 200km radius of the Dam

^Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision.



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



## 8. Dam hazard—terrorist threat/activity or high energy impact

### 8.1 Overview

The emergency action described in this section relates to a potential dam hazard due to a terrorist threat or activity or a high energy impact on the dam such as a plane crash or meteorite.

The vulnerability of Moura Offstream Storage to a terrorist attack or high energy impact is low.

The flood outlines in Appendix B are there to provide indicative outlines of the maximum potentially affected area of a dam hazard caused by a terrorist attack or a high energy impact. The use of these flood outlines is prescribed below:

- Use the Sunny Day Failure (SDF) outline when a dam failure is in progress or likely due to a terrorist attack or a high energy impact and no concurrent flooding or downstream releases are occurring or expected to occur, or
- Use the Probable Maximum Flood (PMF) outline when a dam failure is in progress or likely due to a terrorist attack or a high energy impact and concurrent flooding or downstream releases are occurring or expected to occur.

**Notes:** Definitions for *Concurrent Flooding* and *Downstream Releases* are provided in Section 1.3

#### 8.1.1 Assessment of circumstances that indicates an increase in the likelihood of terrorist activity or high energy impact

Advice from authorities of a specific risk to water infrastructure is a circumstance that could indicate increased likelihood of a terrorist attack. If this were specific enough to name a dam, this circumstance would trigger Stand Up—1 activation level.

### 8.2 Emergency action roles

Table 21 to Table 25 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).



Figure 4: Terrorist threat/activity or high energy impact flowchart

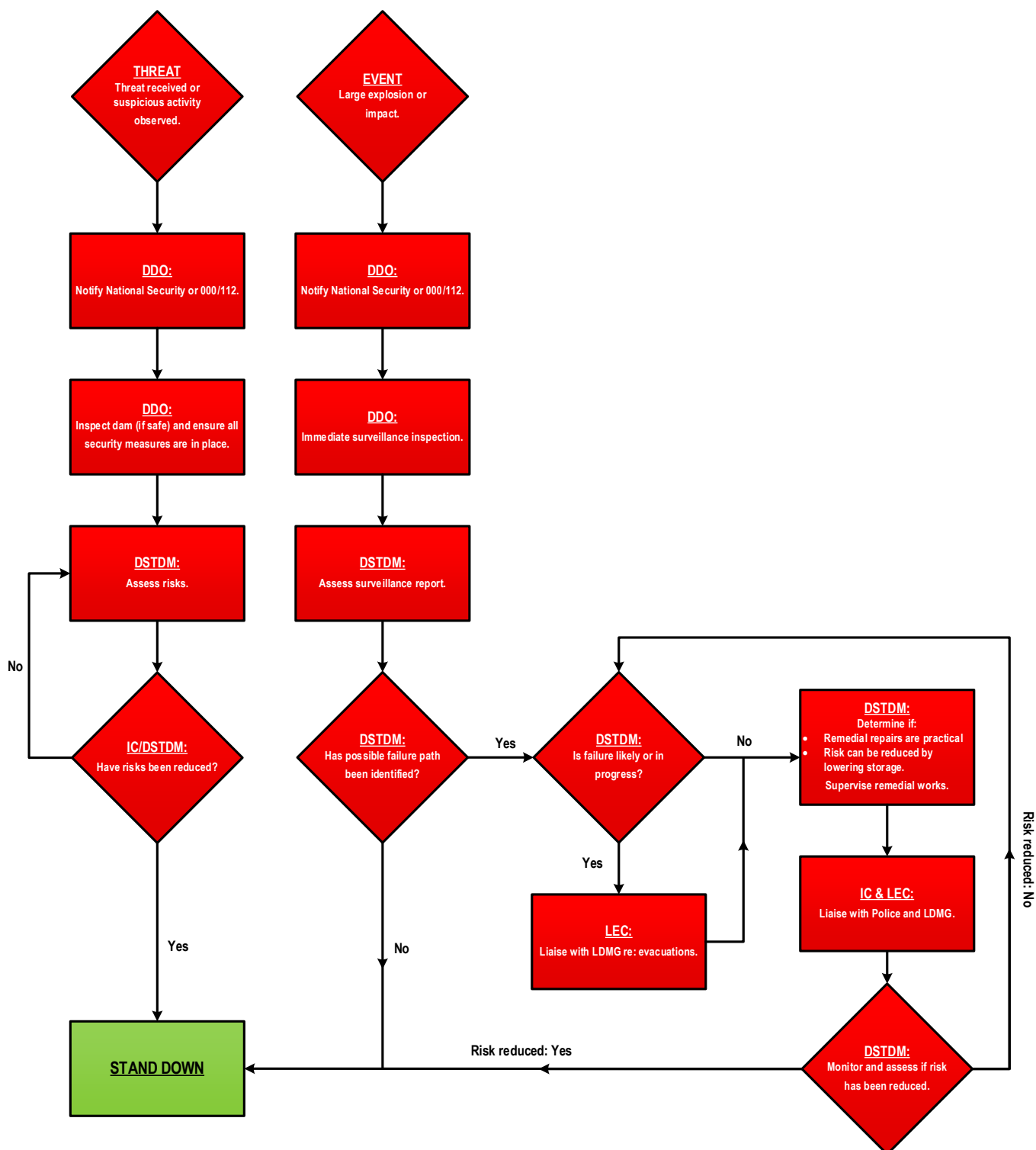


Table 21: Terrorist threat/activity or high energy impact—DDO emergency action

| Activation level       | Alert/Lean Forward   | Stand Up—1   | Stand Up—2  | Stand Up—3  | Stand Down  |
|------------------------|--|--|---|---|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <b>THREAT</b> <ul style="list-style-type: none"> <li>Possible terrorist activity/suspicious behaviour noticed at the dam</li> <li>Threat received</li> <li></li> </ul>   | <b>EVENT</b> <ul style="list-style-type: none"> <li>Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)</li> </ul>           | <b>RESPONSE</b> <ul style="list-style-type: none"> <li>Failure in progress or likely due to impact or explosion, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>In an emergency call 000.</li> <li>Record all communication</li> <li>If any suspicious behaviour noticed, contact DSTDM for advice. If instructed by DSTDM, of if threat received, complete the following:</li> <li>Inspect dam (if safe) and ensure all security measures in place (locked gates, etc.)</li> <li>Photograph/video suspicious items from a safe point and record using the approved forms and send to IC &amp; DSTDM</li> <li>If Police appoint Incident Manager, support and follow instructions</li> <li>Close any affected roads as directed</li> <li>Notify SO</li> <li>Update Dam Logbook as per SOP 12</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Vacate the immediate vicinity of the affected area</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Lower reservoir level, if directed by DSTDM</li> </ul>  | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Update Dam Logbook as per SOP 12</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>DSTDM</li> <li>IC</li> <li>SO</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li><b>#000 Emergency</b></li> </ul>  | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 22: Terrorist threat/activity or high energy impact—LEC emergency action

| Activation level       | Alert/Lean Forward   | Stand Up—1   | Stand Up—2  | Stand Up—3  | Stand Down  |
|------------------------|--|--|---|---|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <b>THREAT</b> <ul style="list-style-type: none"> <li>Possible terrorist activity/suspicious behaviour noticed at the dam</li> <li>Threat received</li> </ul>   | <b>EVENT</b> <ul style="list-style-type: none"> <li>Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)</li> </ul> | <b>RESPONSE</b> <ul style="list-style-type: none"> <li>Failure in progress or likely due to impact or explosion, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>                  |
| Actions                | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>Liaise with DDO, IC and LDMG re: situation</li> <li>If Police appoint Incident Manager, support and follow instructions</li> <li>Monitor situation and assess risks</li> <li>Liaise with relevant council(s) regarding possible road/bridge closures</li> <li>Record all communication</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with DDO and LDMG re: potential for evacuations</li> </ul>                                     | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>DDO</li> <li>IC</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 23: Terrorist threat/activity or high energy impact—IC emergency action

| Activation level       | Alert/Lean Forward   | Stand Up—1   | Stand Up—2  | Stand Up—3   | Stand Down   |
|------------------------|--|--|---|--|--|
| Activation trigger     | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <b>THREAT</b> <ul style="list-style-type: none"> <li>Possible terrorist activity/suspicious behaviour noticed at the dam</li> <li>Threat received</li> </ul>   | <b>EVENT</b> <ul style="list-style-type: none"> <li>Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)</li> </ul> | <b>RESPONSE</b> <ul style="list-style-type: none"> <li>Failure in progress or likely due to impact or explosion, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul>  | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>   |
| Actions                | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>Record all communication</li> <li>Liaise with DDO, DSTDM and LEC</li> <li>Contact National Security</li> <li>If Police appoint Incident Manager support and follow instructions</li> <li>Create Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> </ul> <div> <b>NOTE:</b> IC to carry out LEC actions unless LDMG1 is <i>Stood Up</i> </div> | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with DDO, DSTDM and LEC re: potential for evacuations</li> <li>Mobilise resources to undertake remedial works if directed by DSTDM</li> </ul> | <ul style="list-style-type: none"> <li>Deactivate EAP Event</li> <li>Compile EER and organise delivery to the DSR if required</li> <li>Close Incident Report Record</li> <li>Update Sunwater intranet with dam status</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>DDO</li> <li>DSTDM</li> <li>LEC/ ORR</li> <li>SMT</li> <li>SRT</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>Inform previous notifications of deactivation as required</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>CTG</li> <li>DDMG</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>D/S Residents</li> <li>SDCC Watch Desk</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings

Table 24: Terrorist threat/activity or high energy impact—LEC and IC communication plan

| Activation level | Trigger for communications  | Group to contact   | Method  | Message text   |
|------------------|---|--|---|--|
| Alert            | ALERT NOT APPLICABLE  |  |   |  |
| Lean Forward     | LEAN FORWARD NOT APPLICABLE   |  |   |  |
| Stand Up—1       | <b>THREAT</b> <ul style="list-style-type: none"> <li>Possible terrorist activity/suspicious behaviour notice at the dam</li> <li>Threat received</li> </ul>                                 | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> <li>CTG</li> </ul>                        | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                 | Describe current situation with dam—What is the event? (Dam Safety Risk—Security threat/ impact/explosion, etc.)<br>What is the status? (Received/noted terrorist threat)<br>Discuss any potential road/bridge closures<br>Activate emergency response                         |
| Stand Up—2       | <b>EVENT</b> <ul style="list-style-type: none"> <li>Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)</li> </ul>   | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> <li>CTG (if not at Stand Up—1)</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                 | Describe current situation with dam—What is the event? (Dam Safety Risk—Security threat/ impact/explosion, etc.)<br>What is the status? (Under Investigation)<br>Discuss any potential road/bridge closures (if not discussed at Stand Up—1)<br>Prepare coordinated evacuation |
|                  |   | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>  | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                     | Complete Emergency Alert Request Form as per instructions and email to SDCC Watch Desk to send.<br>Develop messages in consultation with DSTDM   |
|                  |   | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>  | <ul style="list-style-type: none"> <li>SMS (Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS   |
| Stand Up—3       | <b>RESPONSE</b> <ul style="list-style-type: none"> <li>Failure in progress or likely due to impact or explosion, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul>                                     | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                 | Describe current situation with dam—What is the event? (Dam Safety Risk—Security threat/ impact/explosion, etc.)<br>What is the status? (Dam Failure Likely/In Progress)<br>Initiate evacuations   |
|                  |   | <ul style="list-style-type: none"> <li>SDCC Watch Desk</li> </ul>  | <ul style="list-style-type: none"> <li>Phone &amp; Email</li> </ul>                     | Complete Emergency Alert Request Form as per instructions (copies in Appendix A7) and email to SDCC Watch Desk to send.  |
|                  |   | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>  | <ul style="list-style-type: none"> <li>SMS (Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings

Table 24 (Continued): Terrorist threat/activity or high energy impact—LEC and IC communication plan

| Activation level | Trigger for communications   | Group to contact   | Method  | Message text  |
|------------------|--|--|---|---|
| Stand Down       | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul> | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS1</li> <li>QPS2</li> <li>DDMG</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul>                                     | Describe current situation with dam—What is the event? (Dam Safety Risk—Security threat/ impact/explosion, etc.)<br>What is the status? (Dam hazard Stood Down)<br>Advise that failure risk has been reduced and EAP has been deactivated |
|                  |  | <ul style="list-style-type: none"> <li>D/S Residents</li> </ul>                                  | <ul style="list-style-type: none"> <li>SMS<br/>(Phone for those without mobiles)</li> </ul> | Liaise with Sunwater customer support and communications to send appropriate messaging via SMS  |



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Table 25: Terrorist threat/activity or high energy impact—DSTDM emergency action

| Activation level       | Alert/Lean Forward   | Stand Up—1  | Stand Up—2  | Stand Up—3  | Stand Down  |
|------------------------|--|---|---|---|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <b>THREAT</b> <ul style="list-style-type: none"> <li>Possible terrorist activity/suspicious behaviour noticed at the dam</li> <li>Threat received</li> </ul>                  | <b>EVENT</b> <ul style="list-style-type: none"> <li>Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)</li> </ul>   | <b>RESPONSE</b> <ul style="list-style-type: none"> <li>Failure in progress or likely due to impact or explosion, AND</li> <li>Sufficient water in storage to create a dam hazard</li> </ul> | <ul style="list-style-type: none"> <li>Risk assessment has determined that failure risk has reduced</li> </ul>                  |
| Action                 | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>Record all communication</li> <li>Liaise with IC and DDO</li> <li>Assess risks</li> <li>Liaise with SRT</li> <li>Notify DSR</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Arrange an inspection of the dam and assess its condition as soon as possible, when safe to do so</li> <li>Assess risk and determine if failure likely or in progress</li> <li>Determine if remedial repairs are practical</li> <li>Determine if risks can be reduced by lowering storage</li> <li>Supervise* remedial repairs (if applicable)</li> <li>Monitor situation and assess risks</li> </ul> | <ul style="list-style-type: none"> <li>As per previous activation level, AND</li> <li>Liaise with the IC and advise on need to recommend evacuations</li> </ul>                             | <ul style="list-style-type: none"> <li>Forward information for EER to IC email</li> <li>Return to routine activities</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>IC</li> <li>DDO</li> <li>SRT</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |
| External notification  | <ul style="list-style-type: none"> <li>Not applicable</li> </ul> | <ul style="list-style-type: none"> <li>DSR</li> </ul>   | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  | <ul style="list-style-type: none"> <li>As per previous activation level</li> </ul>  |

\* Supervise means provide technical oversight to the work. It does not necessarily mean on-site supervision.



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e.g., taking photographs/video, dam inspections, instrument readings



## 9. Other emergency situation—communications failure

### 9.1 Overview

The emergency action described in this section (Other emergency situation—communications failure) relates to either:

- An emergency situation where all means of communication at the dam site have been lost.
- An emergency situation where all means of communication with the local area have been lost.
- An emergency situation where all means of communication with Brisbane site have been lost.

This section specifies actions and provides guidance for the three situations.

### 9.2 Emergency actions

Due to the large number of different possible scenarios, the table below only covers the most common or likely conditions.

#### 9.2.1 Activation triggers

**Table 26: Communications failure emergency activation trigger summary**

|                                   |  |
|-----------------------------------|--|
| <b>Comms Failure – Site</b>       | <ul style="list-style-type: none"> <li>• Unable to communicate to or from dam site (usually affects DDO)</li> </ul>                                      |
| <b>Comms Failure – Local area</b> | <ul style="list-style-type: none"> <li>• Unable to communicate to or from local area (likely to affect LEC or ORR)</li> </ul>                            |
| <b>Comms Failure – Brisbane</b>   | <ul style="list-style-type: none"> <li>• Unable to communicate to or from Sunwater Brisbane (could affect DSTDM or FODM &amp; will affect IC)</li> </ul> |

#### 9.2.2 Assessment of circumstances that indicates the likelihood of communications failure escalating the activation level of a current dam hazard

The Operations Centre Duty Officer (OCDO) will assess the weather and flood warnings on a daily basis in accordance with the Operations Centre (OC) SOP. The OCDO will escalate to the Flood Operations Decision Maker (FODM) any warnings that have the potential to cause a significant communications failure.

The on-call IC will escalate to the FODM any local intelligence on conditions that could increase the probability of a significant communications failure.

The FODM will determine whether it is reasonably likely that there will be a significant communications failure within the subsequent 24 hours and assess the likely effect on current dam hazards. If required, the FODM will instruct the IC to escalate the activation level of any current dam hazards.

#### 9.2.3 Emergency action roles

Table 27 to Table 30 specify emergency actions for the following roles:

- Dam Duty Officer (DDO)
- Local Event Coordinator (LEC)
- Incident Coordinator (IC)
- Dam Safety Technical Decision Maker (DSTDM).



Table 27: Communications failure—DDO emergency action

| Activation level       | Comms Failure – Local Area  | Comms Failure – Brisbane  |
|------------------------|---|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Unable to communicate to local area including LEC or ORR</li> </ul>  | <ul style="list-style-type: none"> <li>Unable to communicate to Sunwater Brisbane including IC or DSTDM or FODM</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>As much as practicable, assume the role of LEC</li> <li>Continue tasks in accordance with any other current emergency action</li> <li>Every hour, attempt communications by all means noting the following: <ul style="list-style-type: none"> <li>Mobile phone - try texting instead of voice, much higher probability of success</li> <li>Satellite phone - needs to access open sky unless external antenna fitted</li> <li>Fax - generally uses fixed landline and is therefore less likely to have failed</li> <li>Social media - e.g. Facebook (Internet may be available via landline)</li> </ul> </li> <li>Record all communication and attempts via Dam Logbook entries as per SOP 12 and communications log if EAP event is current</li> </ul> | <ul style="list-style-type: none"> <li>Determine if LEC is in communication and if not, assume the LEC role as much as is practicable</li> <li>Continue tasks in accordance with any other current emergency action</li> <li>Every hour, attempt communications by all means noting the following: <ul style="list-style-type: none"> <li>Mobile phone - try texting instead of voice, much higher probability of success</li> <li>Satellite phone - needs to access open sky unless external antenna fitted</li> <li>Fax - generally uses fixed landline and is therefore less likely to have failed</li> <li>Social media - e.g. Facebook (Internet may be available via landline)</li> </ul> </li> <li>Record all communication and attempts via Dam Logbook entries as per SOP 12 and communications log if EAP event is current</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>IC</li> <li>SO (if available)</li> </ul>   | <ul style="list-style-type: none"> <li>LEC</li> <li>SO (if available)</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>As required</li> </ul>   | <ul style="list-style-type: none"> <li>As required</li> </ul>   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 28: Communications failure—LEC emergency action

| Activation level       | Comms Failure – Dam Site   | Comms Failure – Brisbane  |
|------------------------|--|---|
| Activation trigger     | <ul style="list-style-type: none"> <li>Unable to communicate to dam site</li> </ul>  | <ul style="list-style-type: none"> <li>Unable to communicate to Sunwater Brisbane including IC or DSTDM or FODM</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Every hour, attempt communications by all means noting the following: <ul style="list-style-type: none"> <li>Mobile phone - try texting instead of voice, much higher probability of success</li> <li>Satellite phone - needs to access open sky unless external antenna fitted</li> <li>Fax - generally uses fixed landline and is therefore less likely to have failed</li> <li>Social media - e.g. Facebook (Internet may be available via landline)</li> </ul> </li> <li>Record all communication and attempts</li> <li>Assume that the DDO is carrying out LEC role at site as much as practicable</li> <li>Liaise with IC</li> <li>Liaise with DSTDM</li> <li>As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action</li> </ul> | <ul style="list-style-type: none"> <li>Issue Sunwater Incident Alert <ul style="list-style-type: none"> <li>Every hour, attempt communications by all means noting the following: <ul style="list-style-type: none"> <li>Mobile phone-try texting instead of voice, much higher probability of success</li> <li>Satellite phone-needs to access open sky unless external antenna fitted</li> <li>Fax - generally uses fixed landline and is therefore less likely to have failed</li> <li>Social media - e.g. Facebook (Internet may be available via landline)</li> </ul> </li> </ul> </li> <li>Record all communication and attempts</li> <li>Liaise with the DDO and assume IC role</li> <li>As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>IC</li> <li>DSTDM</li> <li>SO (if available)</li> </ul>   | <ul style="list-style-type: none"> <li>DDO</li> <li>DSTDM (if available)</li> <li>SO</li> </ul>   |
| External notifications | <ul style="list-style-type: none"> <li>LDMG</li> </ul>   | <ul style="list-style-type: none"> <li>LDMG</li> <li>QPS</li> <li>DDMG</li> </ul>   |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



Table 29: Communications failure—LEC and IC communication plan

| Activation level           | Trigger for communications   | Group to contact  | Method  | Message text  |
|----------------------------|--|---|---|---|
| Comms Failure – Site       | <ul style="list-style-type: none"> <li>Unable to communicate to or from dam site, AND</li> <li>DDO is at dam site</li> </ul> | <ul style="list-style-type: none"> <li>IC/LEC</li> <li>DSTD</li> <li>SO (if available)</li> <li>LDMG</li> <li>QPS</li> <li>DDMG</li> </ul>  | <ul style="list-style-type: none"> <li>Phone</li> </ul> | Describe current situation with dam communications.<br>What is the status – estimated time to restore communications? |
|                            |  |   |   | EAP Alert Notification—Moura Offsite Storage—Site Communications Failure  |
| Comms Failure – Local Area | <ul style="list-style-type: none"> <li>Unable to communicate to or from local area including LEC and ORR</li> </ul>          | <ul style="list-style-type: none"> <li>DDO (if available)</li> <li>DSTD</li> <li>SO (if available)</li> <li>LDMG (if available)</li> <li>QPS (if available)</li> <li>DDMG (if available)</li> </ul> | <ul style="list-style-type: none"> <li>Phone</li> </ul> | Describe current situation with dam communications.<br>What is the status – estimated time to restore communications? |
|                            |  |   |   | EAP Alert Notification— Moura Offsite Storage —Local Area Communications Failure                                      |
| Comms Failure – Brisbane   | <ul style="list-style-type: none"> <li>Unable to communicate to or from Sunwater Brisbane</li> </ul>                         | <ul style="list-style-type: none"> <li>DSTD (if available)</li> <li>LDMG</li> <li>QPS</li> <li>DDMG</li> </ul>  | <ul style="list-style-type: none"> <li>Phone</li> </ul> | Describe current situation with dam communications.<br>What is the status – estimated time to restore communications? |
|                            |  |   |   | EAP Alert Notification—Sunwater Brisbane Communications Failure   |



Table 30: Communications failure—DSTDM emergency action

| Activation level       | Comms Failure – Dam Site  | Comms Failure – Local Area   |
|------------------------|---|--|
| Activation trigger     | <ul style="list-style-type: none"> <li>Unable to communicate to dam site</li> </ul>   | <ul style="list-style-type: none"> <li>Unable to communicate to local area including LEC and ORR</li> </ul>  |
| Actions                | <ul style="list-style-type: none"> <li>Provide technical advice to IC/LEC on an as needs basis</li> <li>Record all communication</li> <li>As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action</li> </ul> | <ul style="list-style-type: none"> <li>Provide technical advice to IC on an as needs basis</li> <li>Record all communication</li> <li>Assume that the DDO is assisting IC with LEC role</li> <li>As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action</li> </ul> |
| Internal notifications | <ul style="list-style-type: none"> <li>IC</li> <li>LEC</li> <li>And CEO (if time permits)</li> </ul>  | <ul style="list-style-type: none"> <li>IC</li> <li>DDO (if available)</li> <li>And CEO (if time permits)</li> </ul>  |
| External notifications | <ul style="list-style-type: none"> <li>DSR (if applicable)</li> </ul>   | <ul style="list-style-type: none"> <li>DSR (if applicable)</li> </ul>  |



ALL ACTION MUST BE TAKEN WHEN IT IS SAFE TO DO SO  
e.g., taking photographs/video, dam inspections, instrument readings



### **APPENDIX A    Notification and communication lists**

- A1    Sunwater regional notification list
- A2    Sunwater Brisbane notification list
- A3    External notification list
- A4    D/S residents' notification list
- A5    Other reference contacts
- A6    Emergency alert polygon
- A7    Dam failure emergency alert request

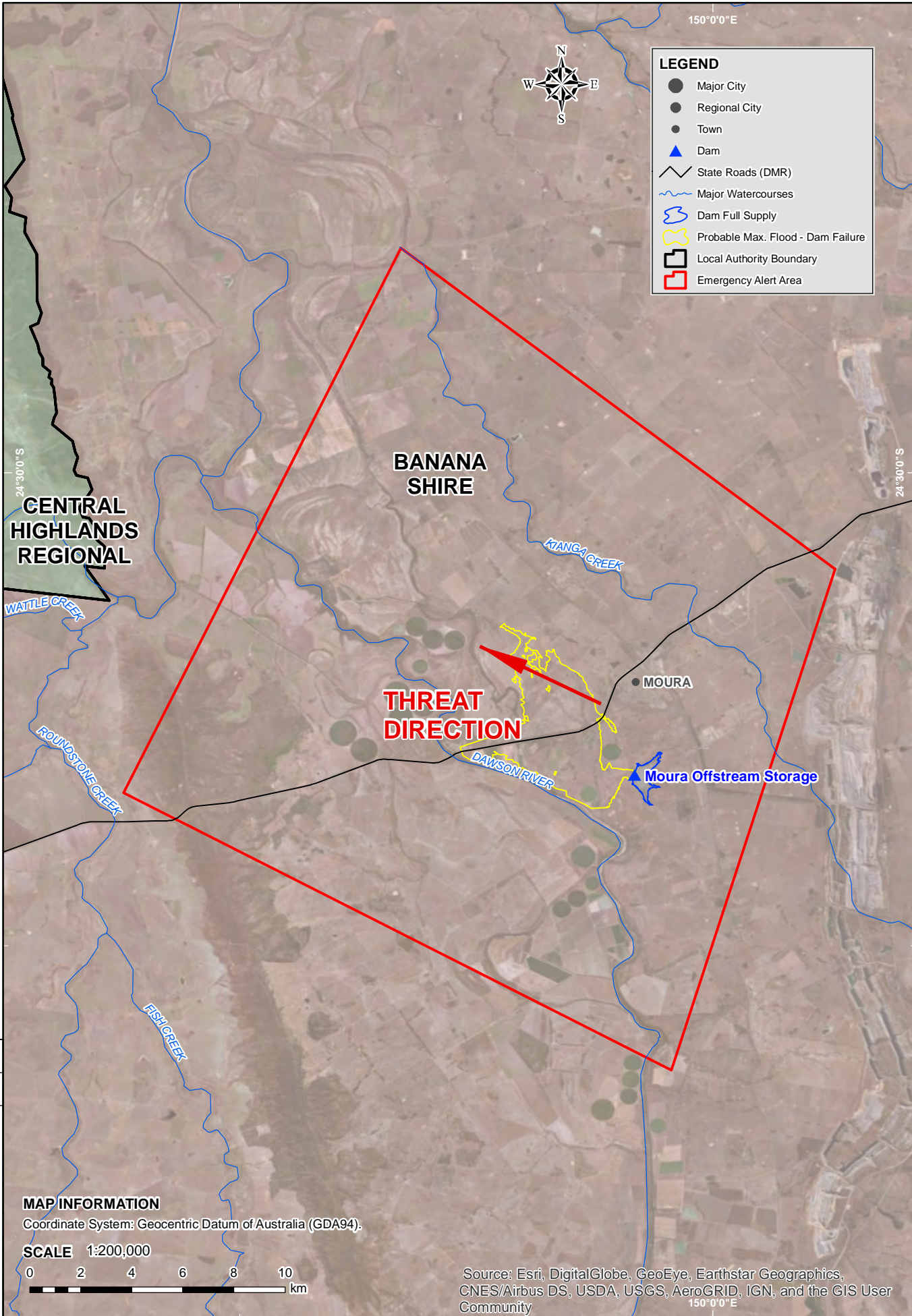
Appendix A1 to Appendix A5 have been redacted


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Document: S:\BW Asset Delivery\SW-BW Service Delivery\YR-WSRW-38-01-05-01 EAP Mapping\Drawings\wcm\Map1  
Emergency Alerts\249583-A.mxd  
Printed: Tuesday, 23/01/2018 11:27:08 AM

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|  |  |          |  |   | SHEET 1 OF 1             |          |
|  |  |          |  |   | DATE <b>JANUARY 2018</b> |          |



## Appendix A7: Dam failure emergency alert request

### Queensland emergency alert request guidelines


An Emergency Alert Request form should be completed, if required (see Sections 5 to 9 for actions) and sent to the SDCC Watch Desk to activate the Moura Offstream Storage Emergency Polygon.

#### Instructions

- This form is not to be used for flood UNLESS a flood has triggered an emergency event.
- Print off the following Queensland Emergency Alert Request form.
- Telephone the SDCC Watch Desk on [REDACTED] and tell them your intention to use the Emergency Alert for an emergency event for Moura Offstream Storage.
- A KML Polygon for this dam is stored in the Sunwater area of the Disaster Management Portal in the Emergency Alert area. Ask the SDCC operative to locate the polygon. It will be a KML file called [REDACTED]
- Give them your phone number, confirm their name, and end the call after advising the form will be sent shortly.
- IC and DSTDM will work together to craft a message relevant to the hazard and discuss with the LDMG, if there is time.
- Fill in the form and send to SDCC watch desk email: [REDACTED] This form must come from the IC, DSTDM, or member of the Executive.
- Phone back to check the message has been sent and ask for an email to confirm.
- Send an internal Incident Alert to advise of completion.
- This form MUST be sent from a Sunwater email address. If Sunwater email is not functional, they can confirm identification through the RDMW (Regulator), if required.
- Use the following text to complete the emergency alert request:

| Filename:  | Voice Message:   | SMS   |
|------------|--|---|
| [REDACTED] | FLOOD EMERGENCY WARNING from Sun Water: People near toh mar sick's road, Saleyards Road, Dawson Highway and Back Creek must LEAVE IMMEDIATELY. Moura Offstream Storage possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Kee an guh Hall is safe. Get full warnings and what you should do at ee em dee dot banana dot q eye tee plus dot com. | FLOOD EMERGENCY WARNING from Sunwater: People near Tomaszuks Rd, Saleyards Rd, Dawson Highway and Back Creek must LEAVE IMMEDIATELY. Moura Offstream Storage possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Kianga Hall is safe. Get full warnings and what you should do at <a href="http://emd.banana.qitplus.com/">http://emd.banana.qitplus.com/</a> . |

The following two pages contain a pre-filled copy of the Moura Offstream Storage Emergency Alert request form.

|  |  |  |  |                     |
|--|--|--|--|---------------------|
| <br><b>Queensland Government</b>   | <b>PHONE THE SDCC WATCH DESK</b>                   |  | <b>- ADVISE EA IS BEING DEVELOPED</b>                    |                     |
|  | <h1>EMERGENCY ALERT REQUEST</h1>                   |  |  |                     |
|  | <b>Location of Alert:</b> Moura Off stream Storage |  |  | <b>Date:</b>        |
| <b>LGA/Agency requesting:</b>  |  |  | <b>Time:</b>   |                     |
| <b>Requesting Officer:</b><br><b>Name:</b><br><b>Agency/Position:</b>  |  |  | <b>Telephone:</b><br>(SDCC Watch Desk may telephone you) |                     |
| <b>Email:</b>  |  |  |  |                     |
| <b>Advised</b> <b>LDC/LDMG:</b> <input type="checkbox"/> YES <b>DDC/DDMG:</b> <input type="checkbox"/> YES <b>Neighbouring LDMG/LGA:</b> <input type="checkbox"/> YES <input type="checkbox"/> N/A   |  |  |  |                     |
| <b>Send Alert</b>  |  | <b>Immediately:</b> <input type="checkbox"/> YES <b>Scheduled:</b> <input type="checkbox"/> YES      Date & Time    /    /    :    hrs   |  |                     |
| <b>Event Type</b>  |  | <input type="checkbox"/> Cyclone <input type="checkbox"/> Storm Tide <input type="checkbox"/> Flash Flood <input type="checkbox"/> Flood<br><input type="checkbox"/> Bushfire <input type="checkbox"/> Fire Incident <input type="checkbox"/> Smoke / Toxic Plume <input type="checkbox"/> Chemical Spill<br><input type="checkbox"/> Tsunami (Sent as Location Based Text Message ONLY)<br><input checked="" type="checkbox"/> Other (please specify): Catastrophic Dam Failure |  |                     |
| <b>Distributed by:</b><br>(Channel)  |  | <input checked="" type="checkbox"/> Voice (Landline only) <input checked="" type="checkbox"/> SMS – Location Based (Location of phone at time of distribution) <input type="checkbox"/> SMS – Service Address Based (Registered billing address)   |  |                     |
| <b>Message Severity</b>  |  | <input checked="" type="checkbox"/> Emergency Warning (Activates SEWS) <input type="checkbox"/> Watch & Act <input type="checkbox"/> Advice  |  |                     |
| <b>Threat Direction Required?</b><br>(e.g. Fire, Dam Spill)  |  | <input type="checkbox"/> YES <input type="checkbox"/> N/A <b>Threat location indicated on map?</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> N/A<br>Only For Emergency Warning Voice & Service Address SMS  |  |                     |
| <b>EA Messaging Filename (Doc, Pdf):</b>   |  | <b>Polygon Filename, (Kml, Kmz, Gml, GeoJSON):</b><br>Number of polygons _____ (if multiple, attach list in order of priority)   |  |                     |
| <b>Supplied via:</b> <input type="checkbox"/> DM Portal <input type="checkbox"/> Email <input type="checkbox"/> Verbal <input type="checkbox"/> Other<br>Other (please specify):   |  | <b>Supplied via:</b> <input type="checkbox"/> DM Portal <input type="checkbox"/> Email <input type="checkbox"/> Verbal <input type="checkbox"/> Other<br>Other (please specify):   |  |                     |
| <b>Voice:</b> Type or handwritten, max 4000 characters incl spaces. (Ideally message should be < 450 characters)   |  |  |  |                     |
| FLOOD EMERGENCY WARNING from Sun Water: People near toh mar sick road, Saleyards Road, Dawson Highway and Back Creek must LEAVE IMMEDIATELY. Mah ruh Offstream Storage possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Kee an guh Hall is safe. More info <a href="http://www.emd.banana.dot.q.eyetee.plus.com">www.emd.banana.dot.q.eyetee.plus.com</a> . Call 000 if your life is in danger. |  |  |  |                     |
| <b>SMS:</b> Type or handwritten, use capitals for clarity, max 612 characters incl spaces. (Ideally should be < 160 characters incl. spaces)   |  |  |  |                     |
| FLOOD EMERGENCY WARNING from Sunwater: People near Tomaszuks Rd, Saleyards Rd, Dawson Highway and Back Creek must LEAVE IMMEDIATELY. Moura Offstream Storage possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Kianga Hall is safe. More info: <a href="http://emd.banana.qitplus.com/">http://emd.banana.qitplus.com/</a> . Call 000 if your life is in danger                                  |  |  |  |                     |
| <b>Remove EA from websites:</b>  |  | <input type="checkbox"/> 12 hrs <input type="checkbox"/> 24 hrs <input type="checkbox"/> 48 hrs <input type="checkbox"/> Specify Date & Time: <input type="checkbox"/> Check back in 12 hrs:<br><input type="checkbox"/> Replace previous EA message    /    /    :    hrs    Contact #: _____   |  |                     |
| <b>Requesting Officer:</b>   |  | <b>Signature:</b>  |  | <b>Date:</b> /    / |
| <b>Send to</b>   |  | <b>to confirm receipt</b>  |  |                     |
| <b>FOR USE BY SDCC</b>   |  |  |  |                     |
| EA Request Form completed by:    SDCC Watch Desk <input type="checkbox"/> Requesting Officer <input type="checkbox"/>  |  |  |  |                     |
| Notification of any delays provided to Requestor: <input type="checkbox"/> YES <input type="checkbox"/> NO   |  |  |  |                     |
| <b>EA User Name:</b><br><br>Signature:      Date:    /    /  |  |  | <b>Emergency Alert No:</b>                               |                     |
| <b>Authorising Officer Name:</b><br><br>Signature:      Date:    /    /  |  |  | <b>EMS EA Campaign Report ID:</b>                        |                     |
| Report provided to Requestor on EA outcomes: <input type="checkbox"/> YES <input type="checkbox"/> NO  |  |  |  |                     |
| The EA Manual, EA Quick Reference Guide, EA Request Form Template are available at: <a href="http://www.disaster.qld.gov.au">www.disaster.qld.gov.au</a>   |  |  |  |                     |



# DO NOT SEND THIS PAGE

(Sunwater internal use only)

## Emergency Alert (EA) Request instructions

Complete ALL initial fields, especially contact details, and check applicable boxes.

|                |   |
|----------------|---|
| <b>STEP 1.</b> | EA Polygon Area (e.g., detailed description and location reference to allow positive identification of message area, including street names with cross street, areas of interest such as parks, rivers, dams, coastal areas) it is preferable to attach a map identifying the message area. If a Threat Direction has been requested, please clearly indicate it on the map.<br><br>Check applicable box. |
| <b>STEP 2.</b> | Enter the Polygon file name/s.  |
| <b>STEP 3.</b> | <i>Sunwater Polygons are all in *.kml format.</i><br>Check applicable box.  |
| <b>STEP 4.</b> | <i>Sunwater Messaging/spatial data is always supplied via DMportal.</i><br>Check applicable box.<br><br>Enter the file name.  |

**Voice Message:** Either type or handwrite the required message in CAPITALS. As the message will be translated by a text-to-speech process it is important that words are not unintelligible when translated e.g., “qld” used in a web site address must be entered as “Q L D”, similarly the word “DOT” must be entered into a web address instead of a full stop.

An Emergency Warning message must start with “EMERGENCY EMERGENCY” Do not use special characters.

**SMS:** Either type the message or handwrite the characters into the boxes.

Capitals only required as per normal grammar rules, but an Emergency Warning message must start with “EMERGENCY EMERGENCY” (in capitals). Do not use special characters.

### Voice example:

EMERGENCY. EMERGENCY. SUN WATER ADVISE IMMINENT FAILURE OF CANIA DAM. RESIDENTS DOWNSTREAM OF THE DAM NEED TO ACT TO PROTECT LIFE AND LEAVE IMMEDIATELY. FAILURE OF THE DAM WILL RESULT IN EXTREMELY DANGEROUS FLOODING DOWNSTREAM INCLUDING: MOONFORD AND MONTO. DO NOT DELAY. LEAVE NOW. CENTRAL MONTO AND BILOELA ARE SAFE LOCATIONS.

### SMS example:

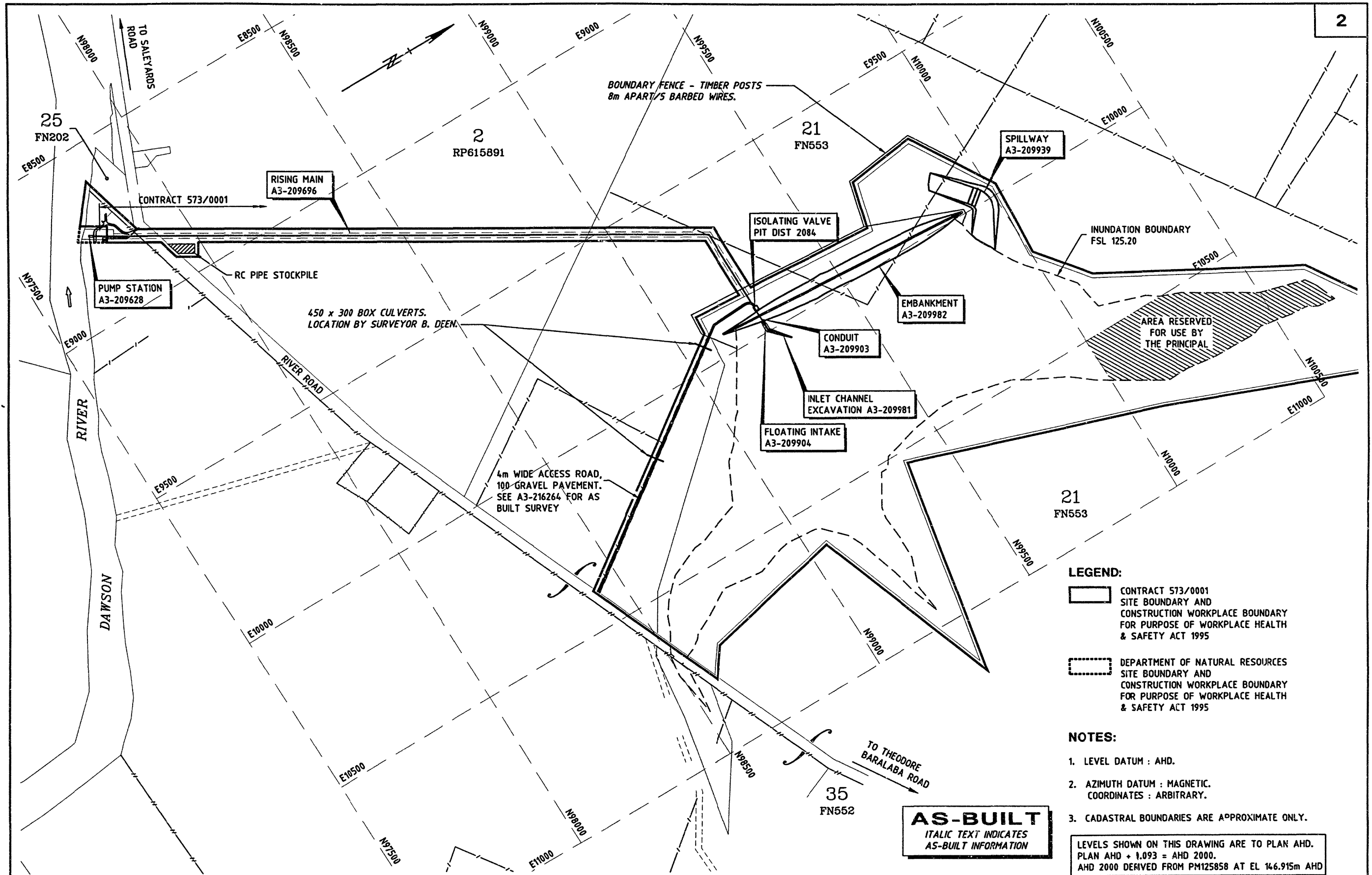
EMERGENCY. EMERGENCY. Sunwater advise imminent failure of Cania Dam. Take action to protect life and leave now. Moonford and Monto are at risk. Info on ABC Radio. Central Monto & Biloeila are safe.

**If using template EA messages, please provide the appropriate variables that are in the template message guides. Refer to the Queensland EA Manual for copies of the template message guides.**

## APPENDIX B Drawings, inundation maps and emergency control measures

- B1 Drawings
- B2 Flood impact—downstream
- B3 Inundation maps
- B4 Emergency access routes
- B5 Locality plan

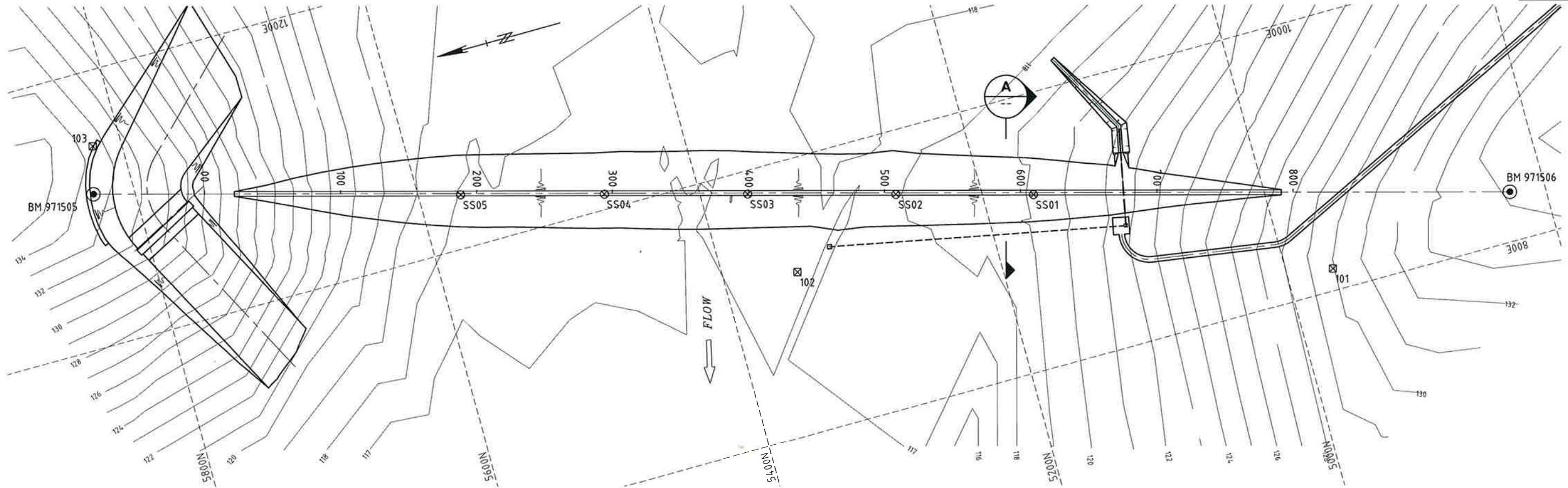
**NOTE:** Actual levels may differ from those shown in flood inundation maps due to variations in assumptions made in the models to actual flood events



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T:\Asset Solutions\SW-Dawson Valley VSSN-WLBD-04-01-01-AR\_MOS Survey Points\Drawings\AutoCAD\232479.dwg  
24 Jun 2009 1:26 PM

DRAWING PRODUCED BY:  
ASSET SOLUTIONS  
LEVEL 9, 179 TURBOT ST  
BRISBANE QLD 4000  
TEL: (07) 3120 0000



SURFACE SETTLEMENT INSTALLATIONS

| No | EASTING  | NORTHING | ELEVATION | REMARKS |
|----|----------|----------|-----------|---------|
| 01 | 926.984  | 5163.639 | 128.063   |         |
| 02 | 953.996  | 5261.039 | 127.913   |         |
| 03 | 983.257  | 5366.083 | 127.826   |         |
| 04 | 1011.156 | 5467.466 | 127.945   |         |
| 05 | 1038.875 | 5569.593 | 127.952   |         |

SURVEY CONTROL STATIONS

| No        | EASTING  | NORTHING | ELEVATION | REMARKS |
|-----------|----------|----------|-----------|---------|
| BM 971505 | 1111.2   | 5829.5   | 133.922   |         |
| BM 971606 | 835.9    | 4825.8   | 134.701   |         |
| 101       | 816.076  | 4966.273 | 131.709   | PILLAR  |
| 102       | 918.119  | 5345.967 | 119.166   | PILLAR  |
| 103       | 1145.442 | 5820.629 | 135.956   | PILLAR  |

SECTION



SCALE B

NOTES:

- LEVELS DATUM: AHD.  
(LEVELS ON THE DESIGN DRAWINGS ARE AHD MINUS 0.093m.)
- AZIMUTH DATUM : MGA94 ZONE 55.
- COORDINATES : PLANE TRUNCATED.  
EASTING: ADD 800,000 TO EQUATE TO PLANE MGA94 ZONE 55  
NORTHING: ADD 7,270,000 TO EQUATE TO PLANE MGA94 ZONE 55
- TOP OF PILLAR AND SETTLEMENT MARKS ARE 0.055m LOWER THAN LEVELS SHOWN IN TABLES.

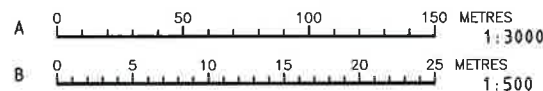
LEGEND:

- ⊗ SURFACE SETTLEMENT POINT
- ⊠ CONTROL STATION

| REVISION | DATE | REMARKS | CKD | PSD |
|----------|------|---------|-----|-----|
|          |      |         |     |     |
|          |      |         |     |     |
|          |      |         |     |     |
|          |      |         |     |     |

| REFERENCE DRAWINGS |  |  |  |  |  |
|--------------------|--|--|--|--|--|
|                    |  |  |  |  |  |
|                    |  |  |  |  |  |
|                    |  |  |  |  |  |
|                    |  |  |  |  |  |

SCALES (A3 SIZE)



|  |                                     |
|--|-------------------------------------|
| DRAWN<br>RET<br>CHECKED<br>APPROVED<br>MANAGER RISK ASSESSMENT | DESIGNED<br>CHECKED<br><br>K. L. L. |
|--|-------------------------------------|



DAM SAFETY INVESTIGATION  
MOURA OFFSTREAM STORAGE  
INSTRUMENTATION LAYOUT

|                 |          |
|-----------------|----------|
| CONTRACT NUMBER |          |
| DRAWING NUMBER  | 232479   |
| DATE            | JUN 2009 |



S:\BW Asset Delivery\SW-Dawson Valley WSS\VR-WLBD-01-01 Dam Safety Support Moura OSS\Drawings\AutoCAD\246515-A.dwg  
27 Nov 2015 10:20 AM

DRAWING PRODUCED BY:  
ASSET DELIVERY  
TEL: (07) 3120 0000



CREST LEVEL INFORMATION

| CHAINAGE (m) | ELEVATION (m) | DESCRIPTION |
|--------------|---------------|-------------|
| 0.0          | 127.71        | GATE        |
| 9.9          | 127.41        | CL          |
| 28.5         | 127.32        | CL          |
| 47.9         | 127.32        | CL          |
| 67.3         | 127.34        | CL          |
| 86.2         | 127.27        | CL          |
| 105.4        | 127.18        | CL          |
| 124.5        | 127.22        | CL          |
| 143.5        | 127.25        | CL          |
| 162.9        | 127.21        | CL          |
| 181.8        | 127.21        | CL          |
| 200.4        | 127.29        | CL          |
| 219.5        | 127.28        | CL          |
| 238.5        | 127.23        | CL          |
| 257.7        | 127.21        | CL          |
| 277.0        | 127.23        | CL          |

|       |        |    |
|-------|--------|----|
| 282.2 | 127.22 | CL |
| 301.6 | 127.23 | CL |
| 322.1 | 127.16 | CL |
| 341.3 | 127.16 | CL |
| 360.8 | 127.14 | CL |
| 380.2 | 127.17 | CL |
| 387.4 | 127.14 | CL |
| 394.1 | 127.16 | CL |
| 412.7 | 127.18 | CL |
| 431.9 | 127.17 | CL |
| 450.4 | 127.08 | CL |
| 458.8 | 127.08 | CL |
| 477.7 | 127.16 | CL |
| 496.4 | 127.22 | CL |
| 501.2 | 127.23 | CL |
| 520.1 | 127.33 | CL |
| 539.1 | 127.33 | CL |

|       |        |    |
|-------|--------|----|
| 552.7 | 127.27 | CL |
| 565.7 | 127.30 | CL |
| 584.4 | 127.37 | CL |
| 602.8 | 127.28 | CL |
| 622.0 | 127.32 | CL |
| 641.2 | 127.26 | CL |
| 655.7 | 127.29 | CL |
| 666.6 | 127.33 | CL |
| 683.6 | 127.31 | CL |
| 698.7 | 127.33 | CL |
| 703.4 | 127.29 | CL |
| 722.2 | 127.33 | CL |
| 742.3 | 127.36 | CL |
| 761.0 | 127.28 | CL |
| 775.2 | 127.32 | CL |
| 781.8 | 127.51 | CL |

LEGEND:

▣ - CONTROL STATION (REFER DRAWING 232479).

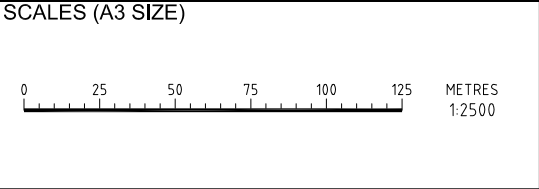
NOTES:

- CHAINAGE IS IN METRES UNLESS NOTED OTHERWISE.
- LEVELS DATUM: AUSTRALIAN HEIGHT DATUM.
- DATE OF SURVEY: 15 APRIL 2014.
- SHADED SURVEY LEVELS ARE BELOW ORIGINAL DESIGN CREST LEVEL (DCL) EL 127.29m.

Levels on this drawing are in metres to AHD  
based on PM 125858 = EL 146.915 (AHD Registered 2000)

| REVISION |   |                |     |          |  |
|----------|---|----------------|-----|----------|--|
|          |   |                |     |          |  |
|          |   |                |     |          |  |
|          |   |                |     |          |  |
| 27/11/15 | A | ISSUED FOR USE | AN  | K.L. EHM |  |
| DATE     |   | REMARKS        | CKD | PASSED   |  |

| REFERENCE DRAWINGS |                        |  |  |
|--------------------|------------------------|--|--|
|                    |                        |  |  |
|                    |                        |  |  |
|                    |                        |  |  |
| 232479             | INSTRUMENTATION LAYOUT |  |  |



|                      |                |
|----------------------|----------------|
| DRAWN<br>PH          | DESIGNED<br>MR |
| CHECKED<br>AN        | CHECKED<br>SM  |
| APPROVED<br>K.L. EHM |                |
| 27/11/15             | RPEQ 2930      |

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ACN 131 034 985

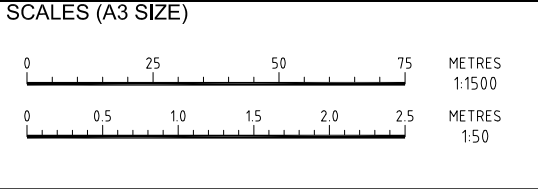
|   |           |                 |
|---|-----------|-----------------|
| MOURA OFFSTREAM STORAGE<br>EMBANKMENT<br>CREST LEVEL SURVEY |           | CONTRACT NUMBER |
| DRAWING<br>NUMBER<br>246515                                 | REV.<br>A |                 |
| SHEET 1 OF 2  |           |                 |
| DATE NOVEMBER 2015  |           |                 |

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27 Nov 2015 10:21 AM

DRAWING PRODUCED BY:  
ASSET DELIVERY  
TEL: (07) 3120 0000

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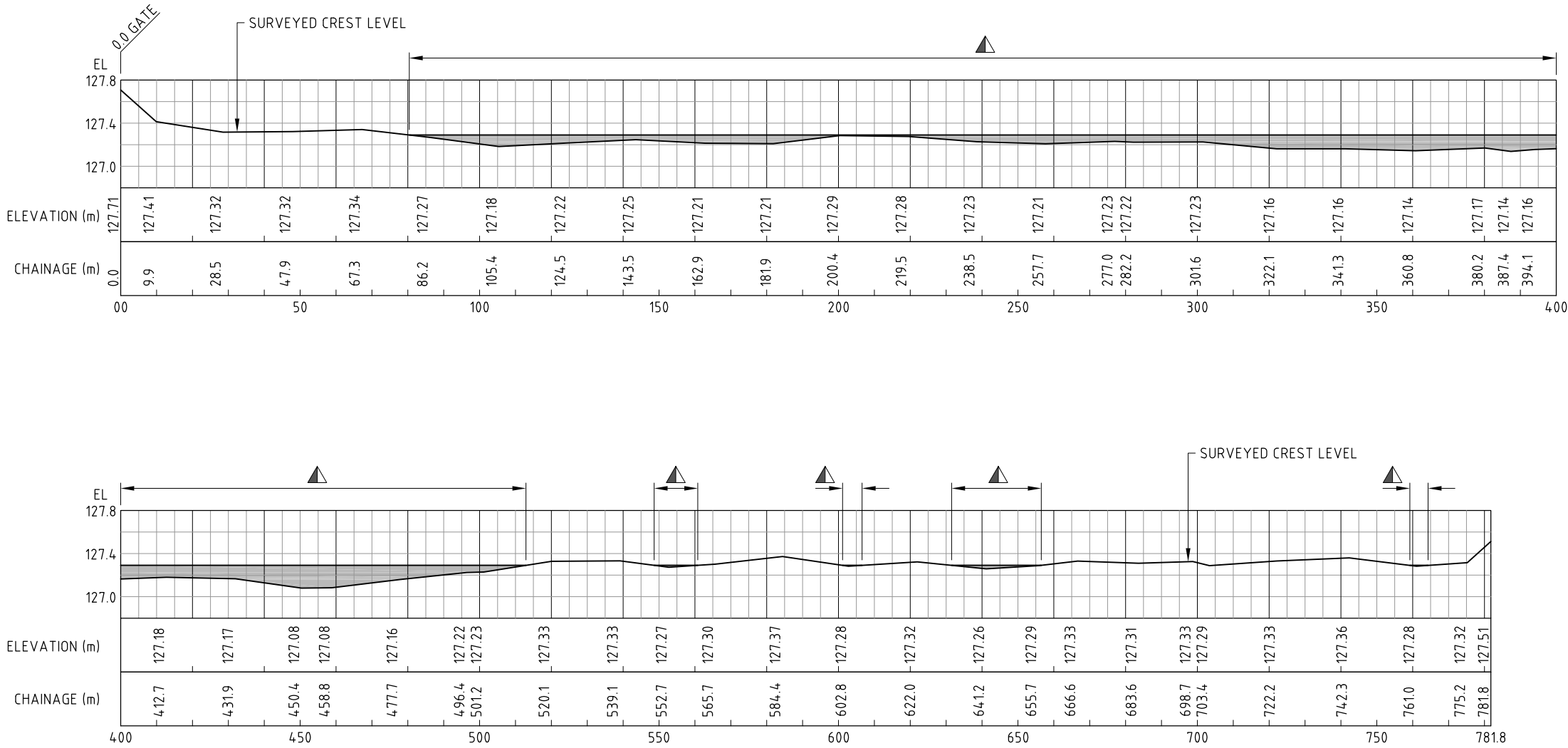
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| 232479             | INSTRUMENTATION LAYOUT |  |  |



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| CHECKED<br>AN        | CHECKED<br>SM  |
| APPROVED<br>K.L. EHM |                |
| 27/11/15             | RPEQ 2930      |



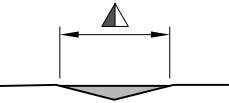
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| MOURA OFFSTREAM STORAGE<br>EMBANKMENT<br>CREST LEVEL SURVEY |           | CONTRACT NUMBER |
| DRAWING<br>NUMBER<br>246515                                 | REV.<br>A |                 |
| SHEET 2 OF 2  |           |                 |
| DATE NOVEMBER 2015  |           |                 |



CREST LEVEL SURVEY LONGITUDINAL SECTION

SCALE: 1:1,500 HORIZONTAL AND 1:50 VERTICAL

LEGEND:



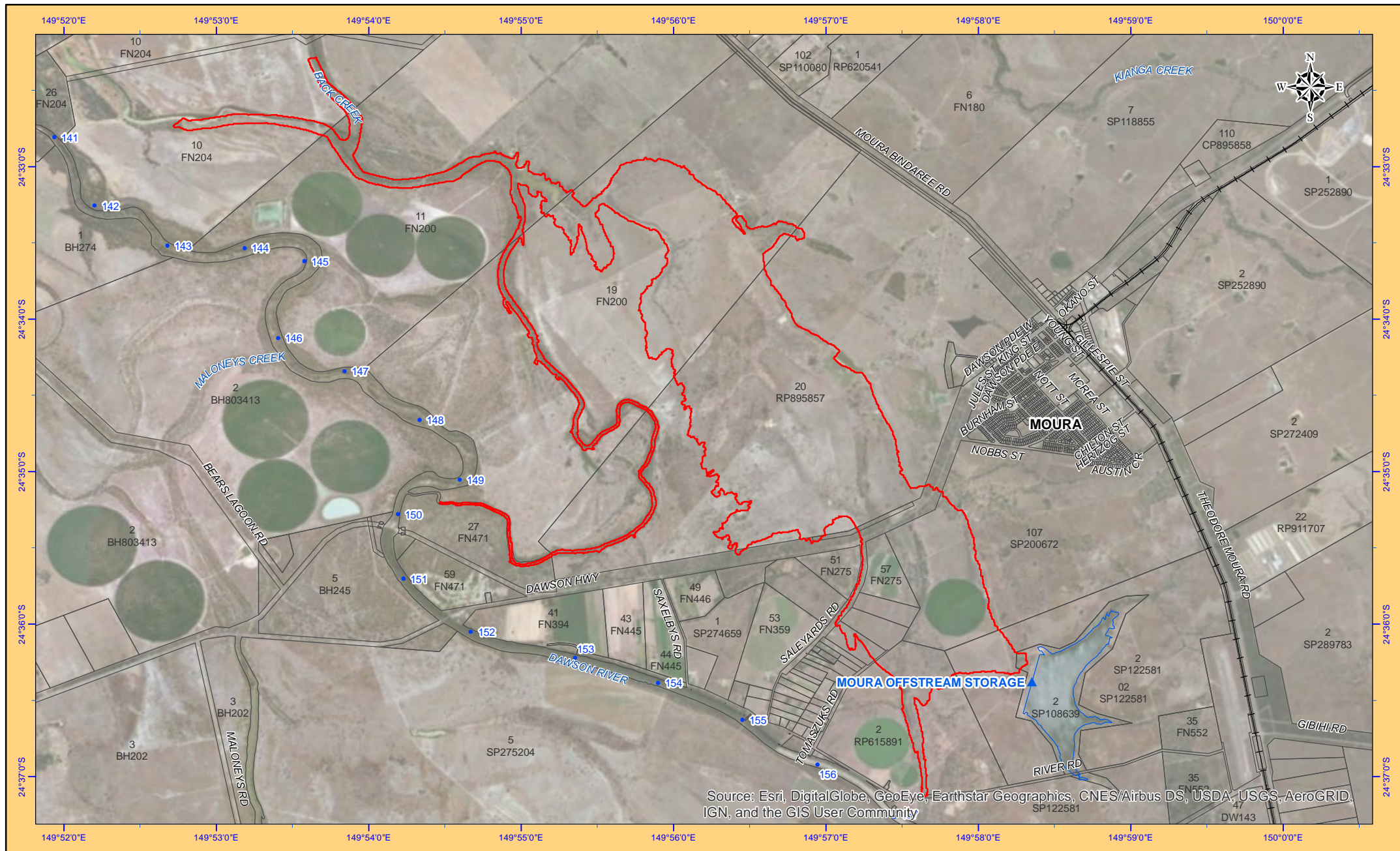
- INDICATES AREAS WHERE CREST LEVEL IS  
BELOW DESIGN CREST LEVEL EL 127.29m AHD.

NOTES:

- FOR DETAILED NOTES REFER SHEET 1.

Levels on this drawing are in metres to AHD  
based on PM 125858 = EL 146.915 (AHD Registered 2000)





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**MAP INFORMATION**

Coordinate System: Geocentric Datum of Australia (GDA94).

**SCALE (A4 SIZE)**

0 600 1,200 1,800 2,400 3,000 1:60,000

m

**LEGEND**

- AMTD (Markers)
- Dam Full Supply Level
- Limit of Downstream Notification Area

**MOURA OFFSTREAM STORAGE**

**DOWNSTREAM NOTIFICATION AREA**

**NOTES**

Areas further downstream will become progressively more impacted by other rainfall and inflows that occur downstream of the dam (not shown here).

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DRAWING No. 250718 B

### Appendix B3: Inundation maps

A Failure Impact Assessment (FIA) was completed by a contractor and issued to Sunwater in July 2017 (ref U). This assessment was reviewed and adopted for use in the 2022 CRA (ref V).

- The following inundation drawings are presented on the following pages:
  - Keymap
  - Sunny Day Failure
  - Probable Maximum Flood

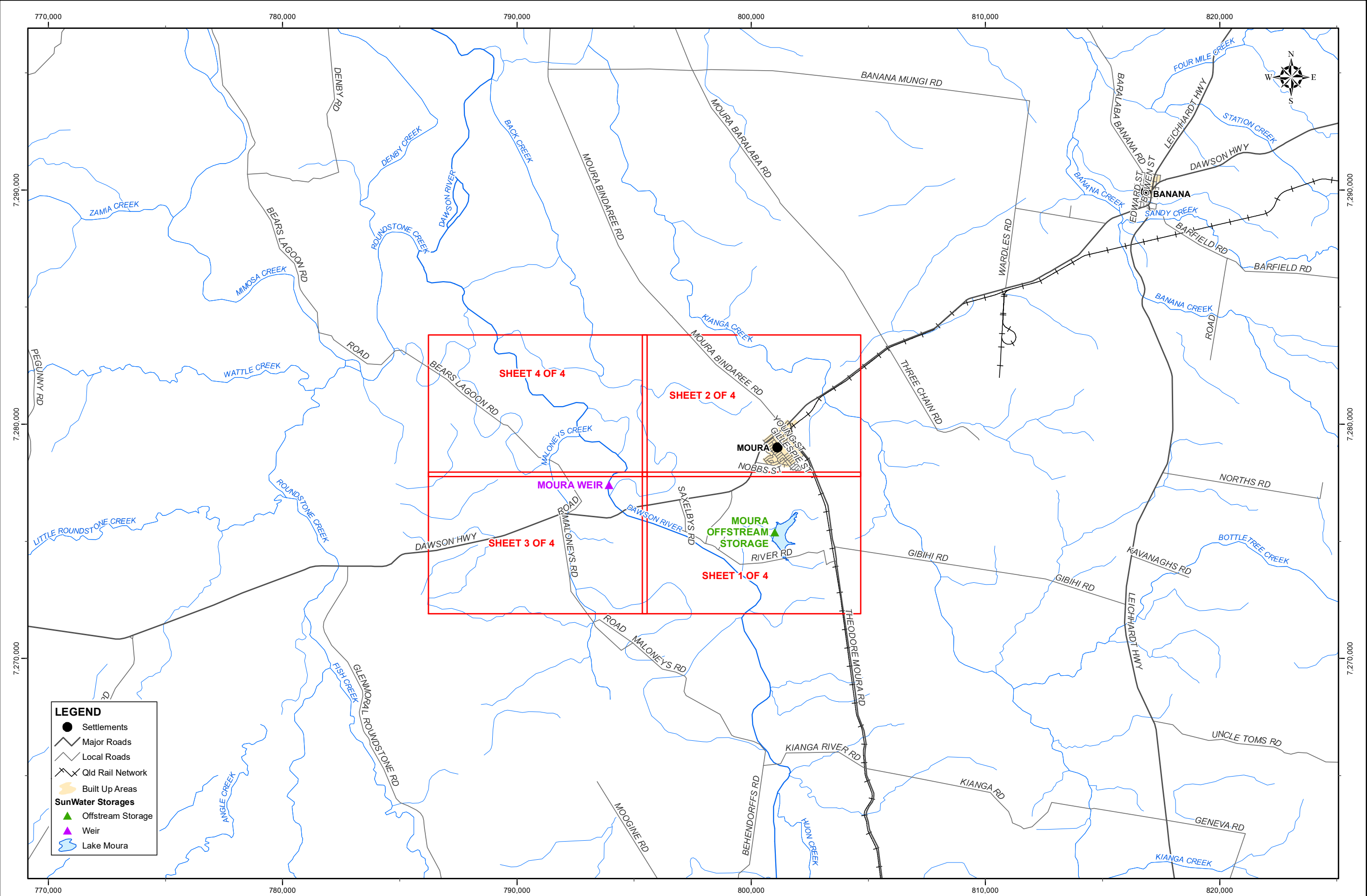
**Disclaimer:** Every effort has been made to ensure the currency of the flood inundation maps reproduced in this EAP. However, as the maps have been extracted from external sources, their accuracy cannot be guaranteed. Please refer to the Local Disaster Management Plan for the most current information.



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| 17/10/18 | A | ISSUED FOR USE |  | IDH | MGH |
| DATE     |   | REMARKS        |  | CKD | PSD |

| MAP INFORMATION   |  |
|---|--|
| Projected Coordinate System: Mapping Grid of Australia (MGA94) Zone 55. |  |
| REFERENCE DRAWINGS  |  |
| 250017 - Sunny Day Failure Inundation Plan                              |  |
| 250018 - Design Crest Flood Inundation Plan                             |  |
| 250019 - Probable Maximum Flood Inundation Plan                         |  |

| SCALES (A3 SIZE)   |  |
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| <div><div></div><div>01.534.567.5</div><div>km</div></div> 1:150,000 |  |

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| APPROVED    |             |
| M.G. HUGHES |             |
| 17/10/2018  | RPEQ: 18351 |



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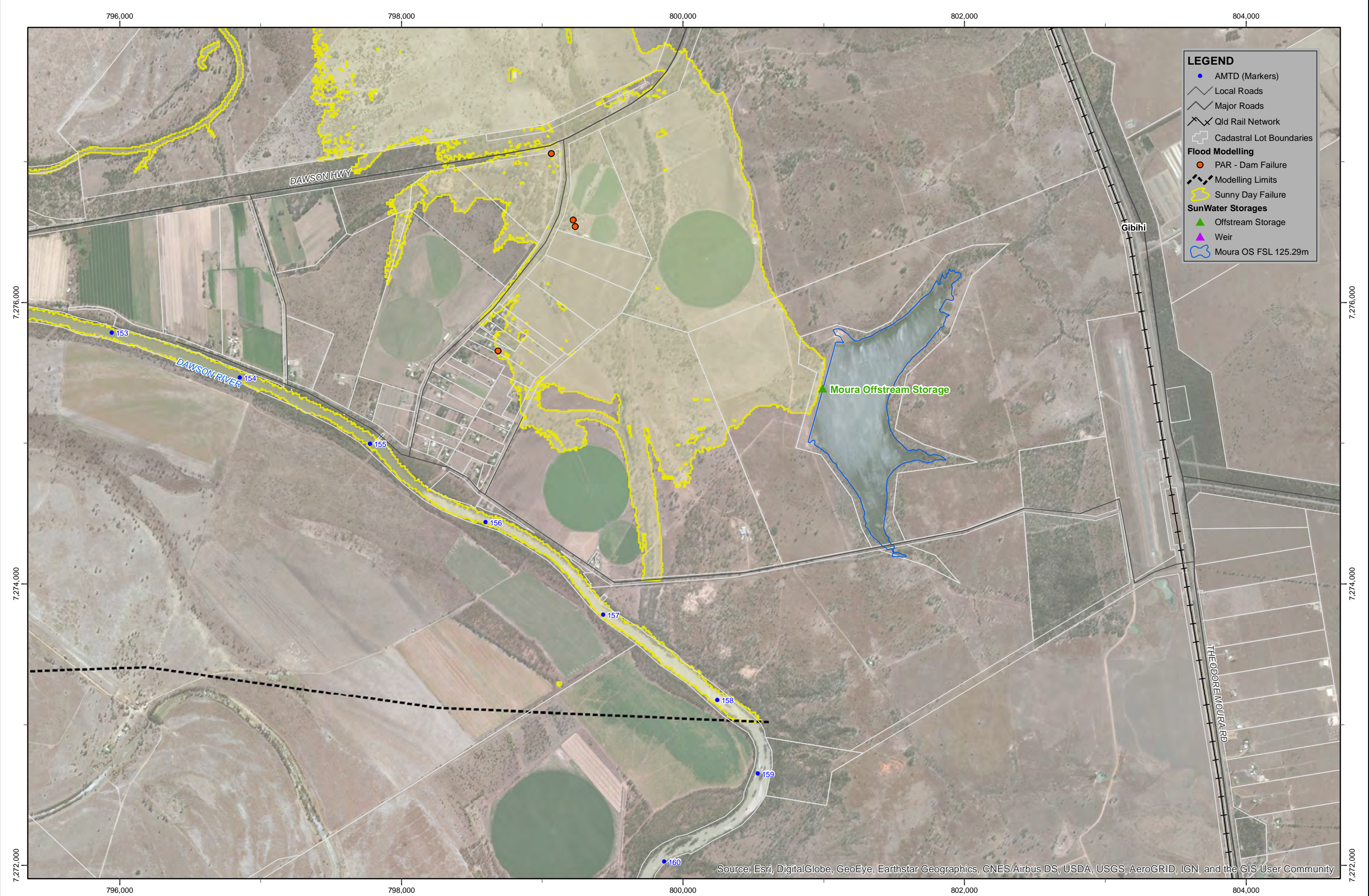
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| CONTRACT NUMBER  |      |
| DRAWING NUMBER   | REV. |
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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| MAP INFORMATION   |  |
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| Projected Coordinate System: Mapping Grid of Australia (MGA94) Zone 55. |  |
| REFERENCE DRAWINGS  |  |
| 250016 - Keymap   |  |



| SCALES (A3 SIZE)            |  |
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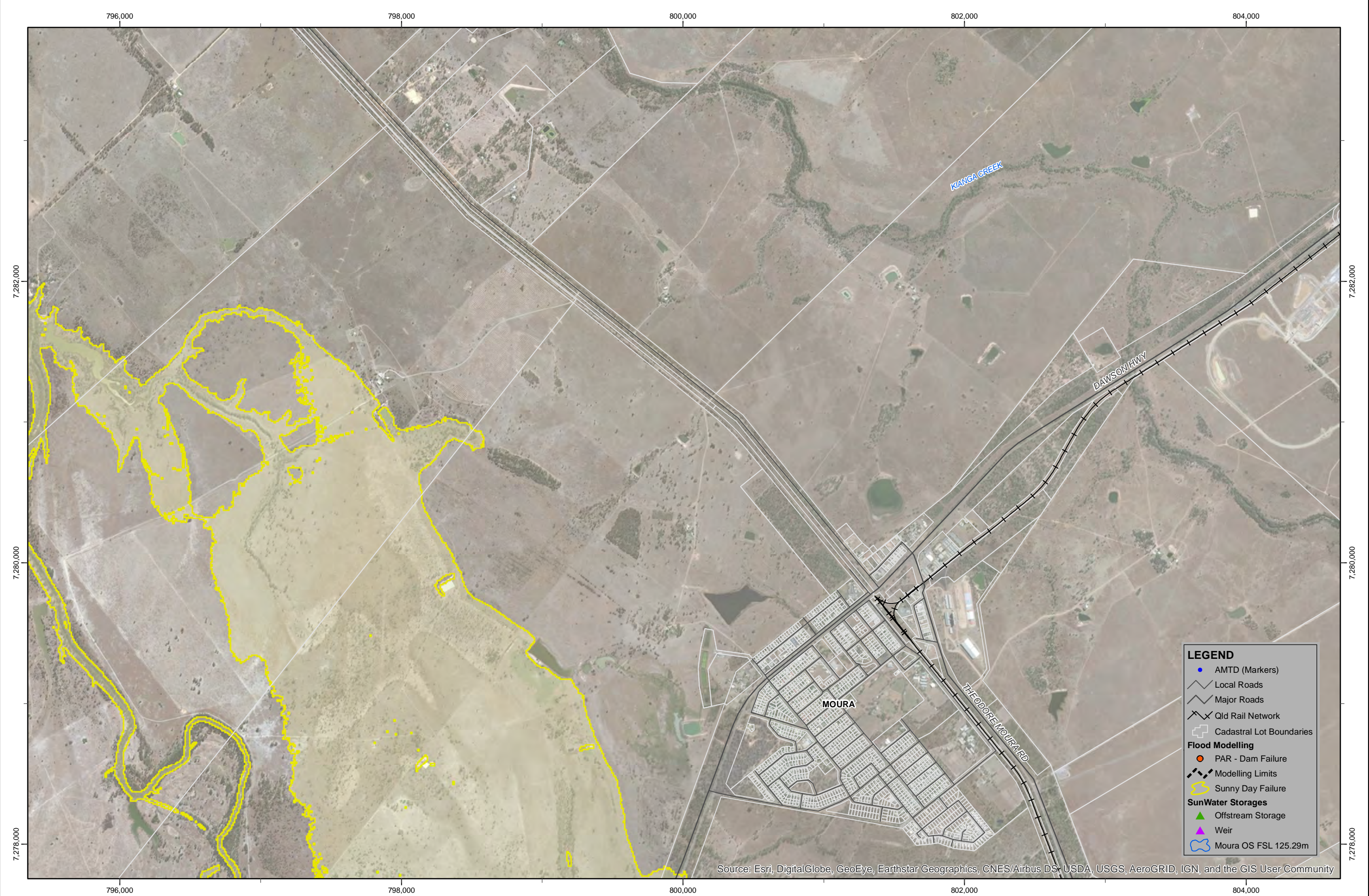
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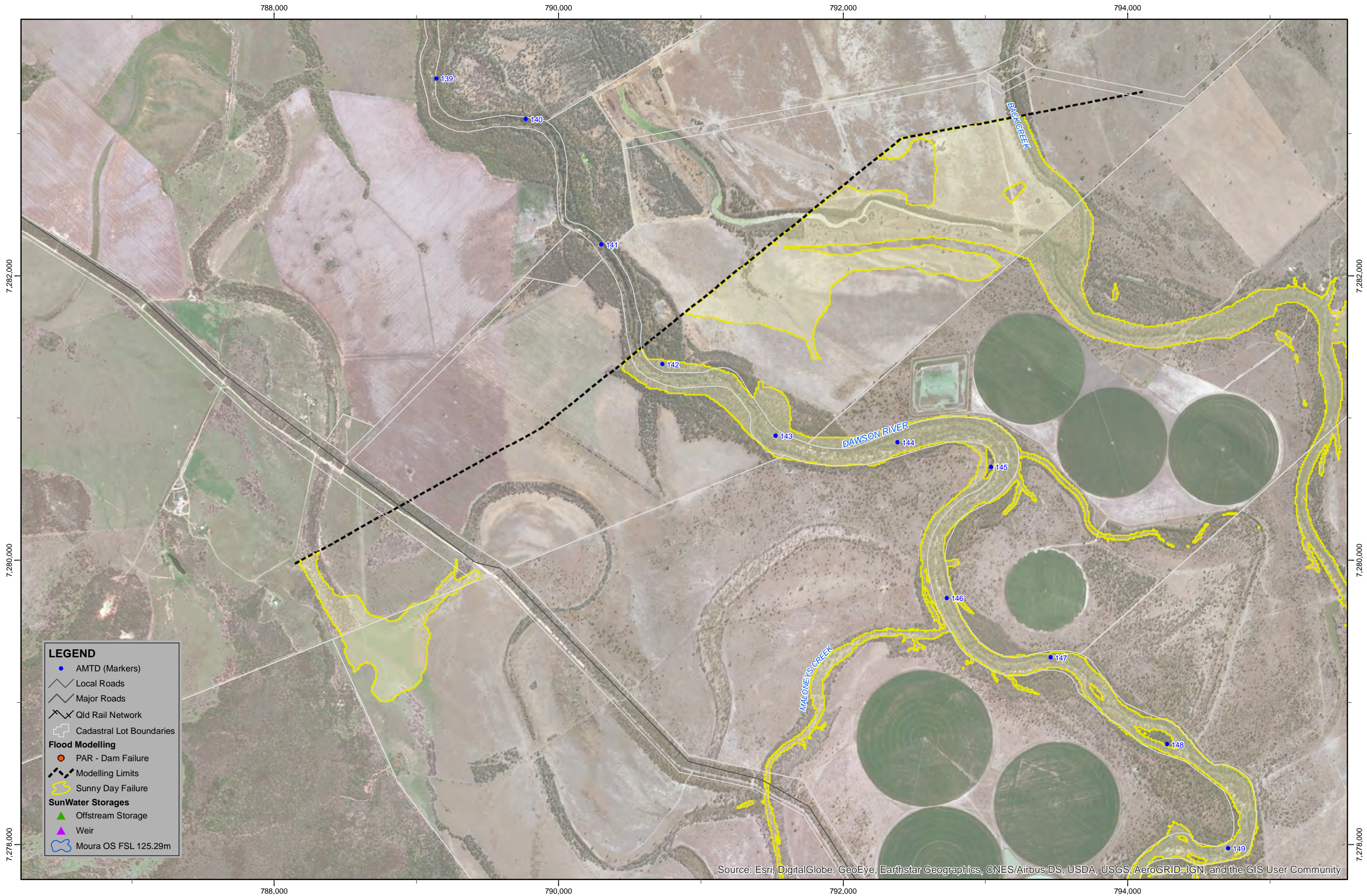
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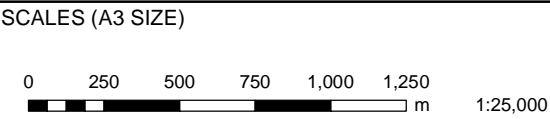
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| MOURA OFFSTREAM STORAGE<br>DAM BREAK ANALYSIS 2018<br>SUNNY DAY FAILURE<br>MAIN EMBANKMENT<br>INUNDATION PLAN |      |
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| SCALES (A3 SIZE)            |  |
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| MOURA OFFSTREAM STORAGE<br>DAM BREAK ANALYSIS 2018<br>PROBABLE MAXIMUM FLOOD<br>MAIN EMBANKMENT<br>INUNDATION PLAN |      |
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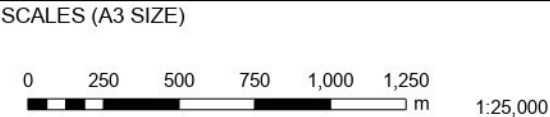
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Projected Coordinate System: Mapping Grid of Australia (MGA94) Zone 55.

REFERENCE DRAWINGS  
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MAIN EMBANKMENT  
INUNDATION PLAN**

CONTRACT NUMBER

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SHEET 2 OF 4

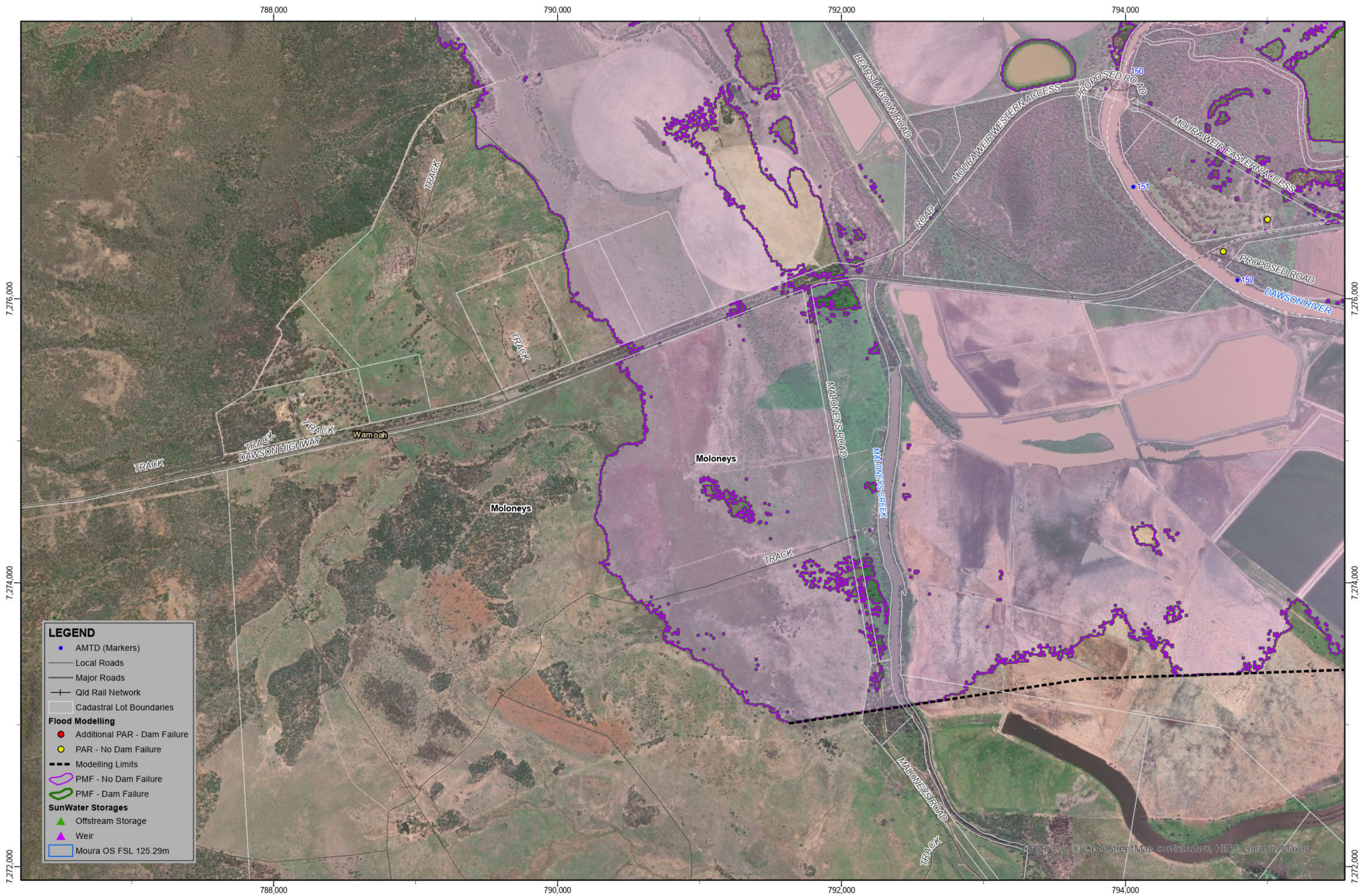
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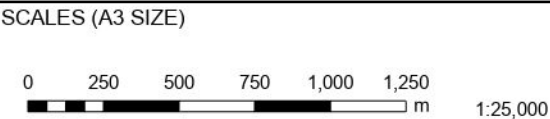
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**MOURA OFFSTREAM STORAGE  
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PROBABLE MAXIMUM FLOOD  
MAIN EMBANKMENT  
INUNDATION PLAN**

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| MAP INFORMATION   |
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| Projected Coordinate System: Mapping Grid of Australia (MGA94) Zone 55. |
| REFERENCE DRAWINGS  |
| 250016 - Keymap   |



| SCALES (A3 SIZE)            |
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| APPROVED<br><b>M.G. HUGHES</b><br>17/10/2018 | RPEQ: 18351           |

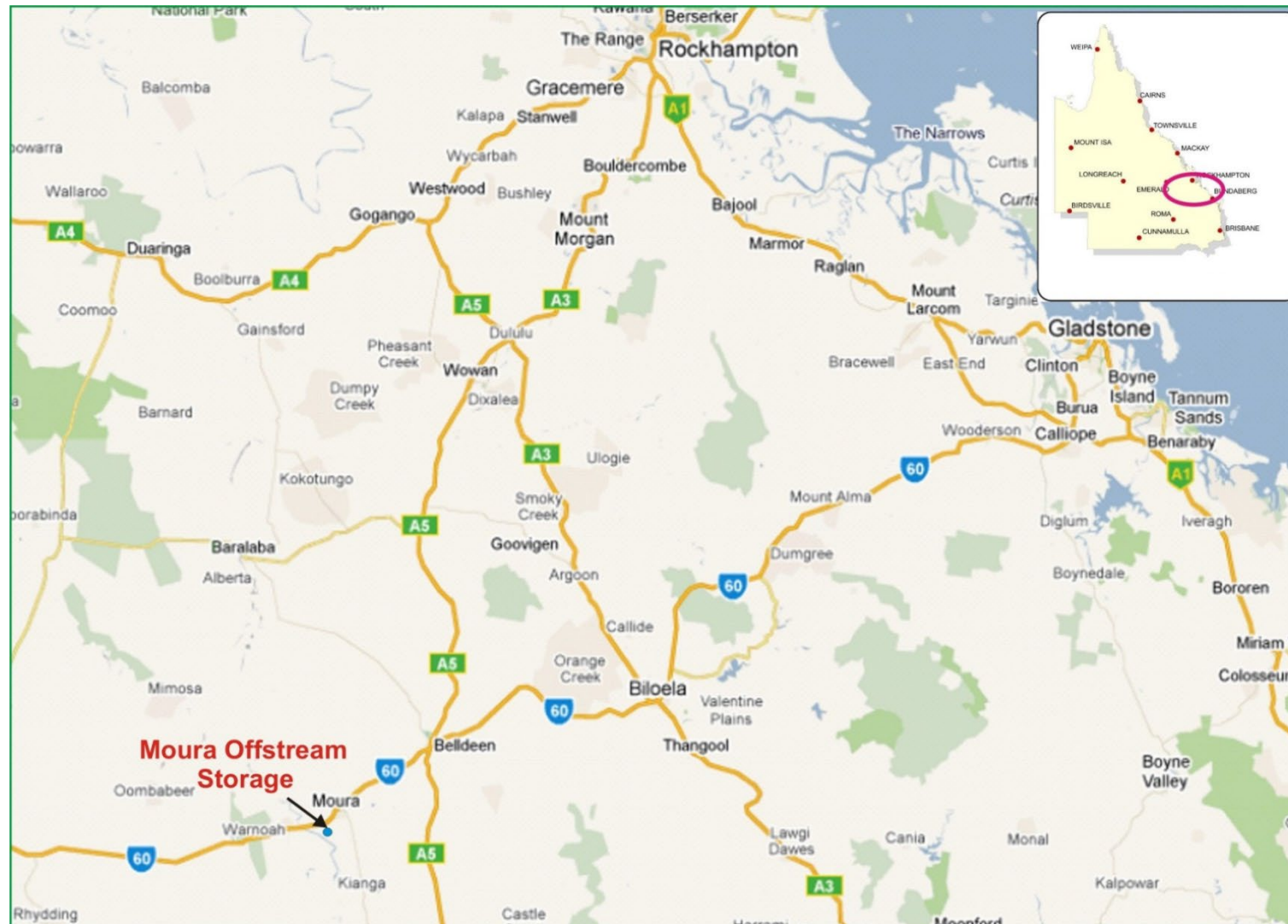


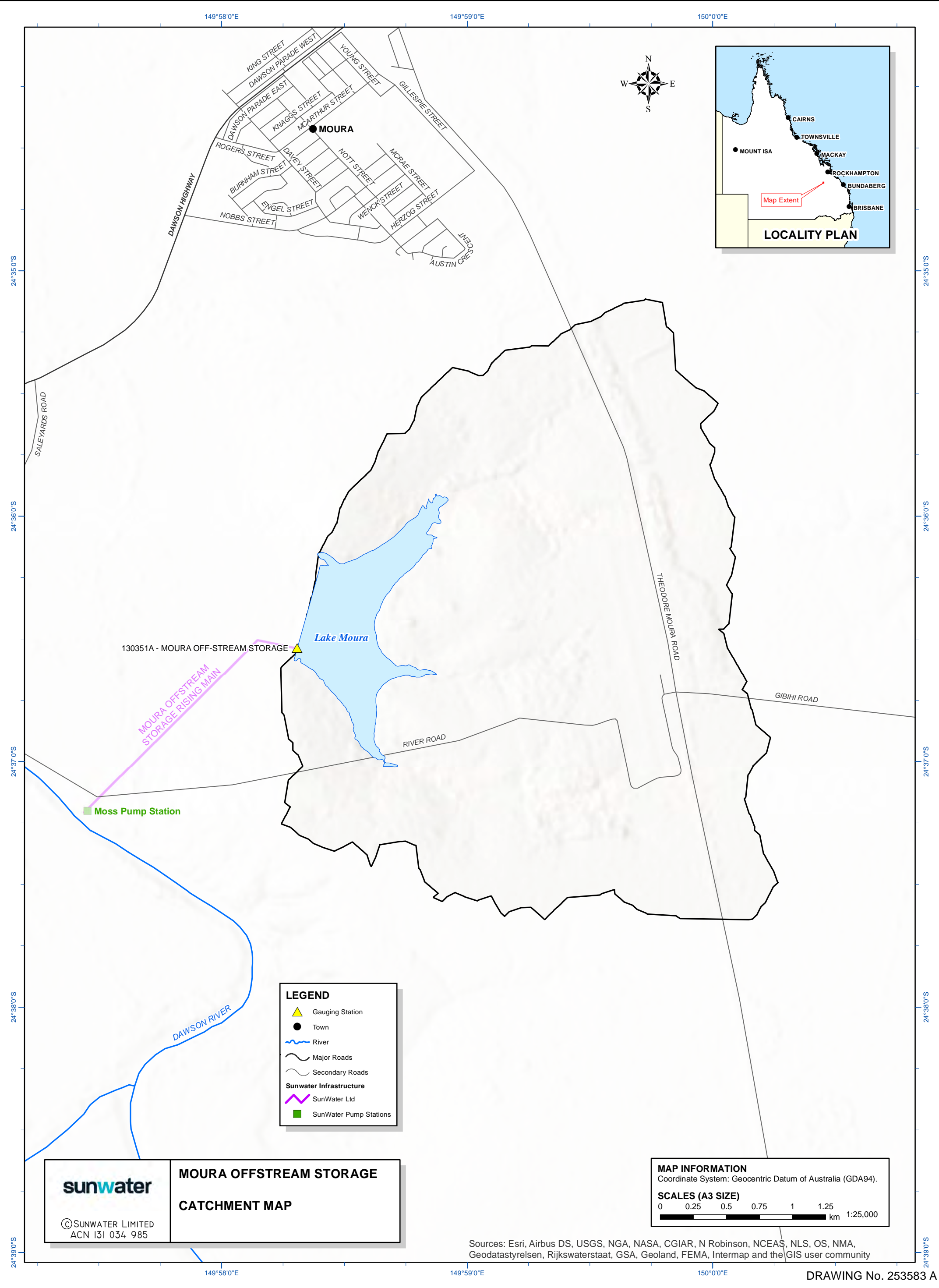
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| DATE OCTOBER 2018  |          |



## Appendix B4: Locality plan

Figure B13: Moura Offstream Storage locality plan

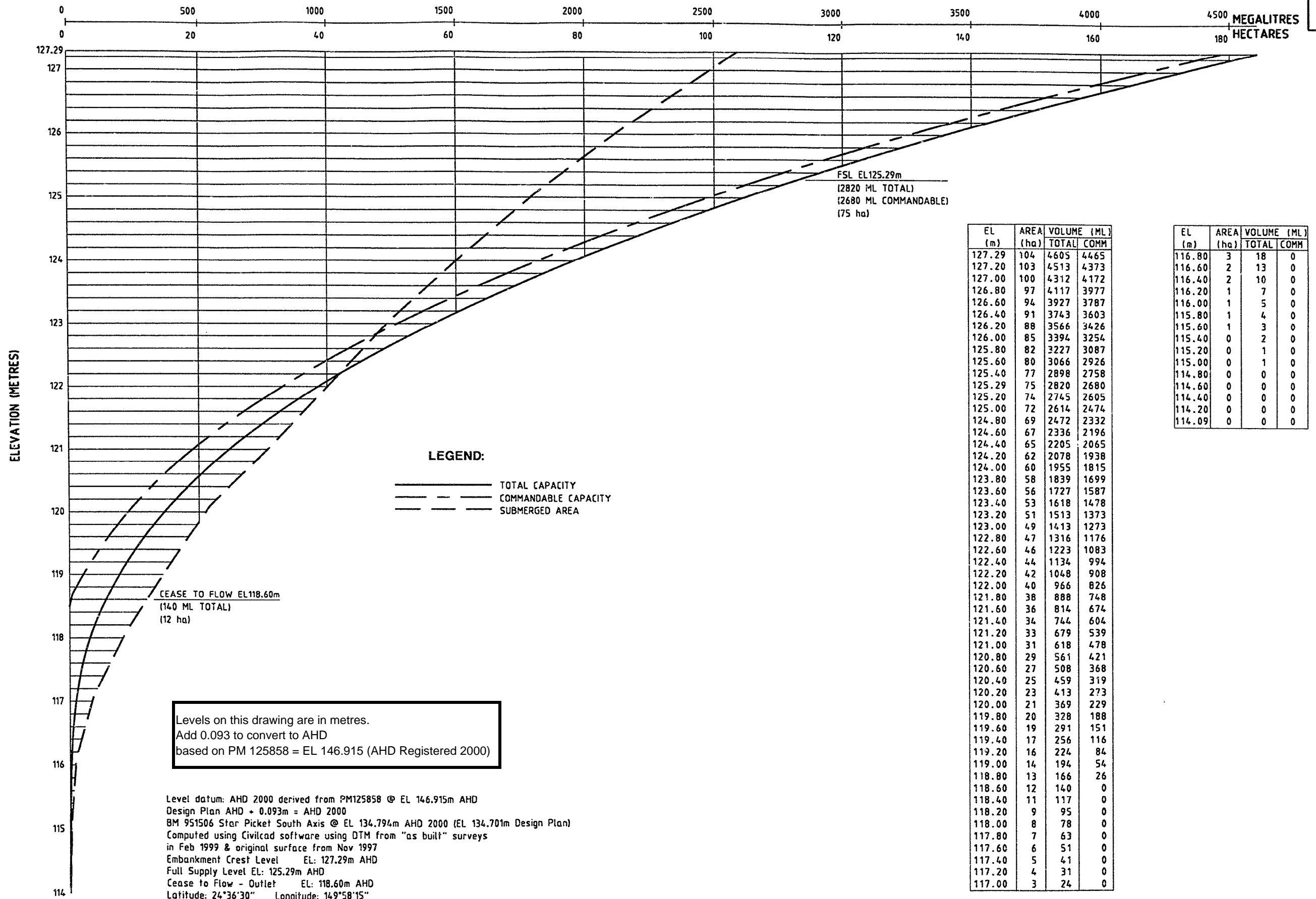




### APPENDIX C Equipment and technical information

- C1 List of equipment available during an emergency
- C2 Moura OS storage curve

Appendix C1 has been redacted



|          |           |   |                |     |                    |        |              |              |  |   |                 |
|----------|-----------|---|----------------|-----|--------------------|--------|--------------|--------------|--|---|-----------------|
| REVISION |           |   |                |     | REFERENCE DRAWINGS | SCALES | DRAFTING     | RECOMMENDED  |  | <b>MOURA OFFSTREAM STORAGE</b><br><b>TOTAL VOLUME</b><br><b>STORAGE CURVE</b> | CONTRACT NUMBER |
|          |           |   |                |     |                    |        | DRAFTING CHK |              |  |   | DRAWING NUMBER  |
|          |           |   |                |     |                    |        | DESIGN       | APPROVED     |  |   | A3-213163       |
|          |           |   |                |     |                    |        | DESIGN CHK   | Doug Houston |  |   | DATE AUG 1999   |
|          | 10/3/2000 | A | AHD Adjustment | DRH |                    |        |              |              |  |   |                 |
|          | DATE      |   | REMARKS        | CKD | PSD                |        |              |              |  |   |                 |

**Appendix D    Interaction with local government and district groups**

**To be populated when EAP next completes a substantive review**

## Annexe — Moura Offstream Storage SMS Messages

### Advice

Stay informed



### Watch and Act

Prepare to leave



### Emergency

Leave immediately

To be issued in consultation with council



**SMS** ADVICE from Sunwater. Moura Off Stream Storage is spilling excess water into the Dawson River. People near Tomaszuks Rd, Saleyards Rd, Dawson Hwy and Back Creek should STAY INFORMED and MONITOR CONDITIONS. Water flows from Moura Off Stream Storage expected to remain within beds and banks of river/may contribute to widespread/localised/overland flooding. Expect increased river flows in 6-12 hours/later today/overnight/tomorrow. There is no danger yet. Call Triple Zero (000) if your life is in danger. Call the SES on 132500 for flood help. Get full warnings and what you should do at <https://bit.ly/RecandSafety>

FLOOD WATCH AND ACT from Sunwater. Excess water spilling from Moura Off Stream Storage into the Dawson River has increased significantly. Water flows from Moura Off Stream Storage may contribute to dangerous/widespread flooding downstream. Expect increased river flows in 6-12 hours/later today/overnight/tomorrow. People near Tomaszuks Rd, Saleyards Rd, Dawson Hwy and Back Creek must PREPARE TO LEAVE in case the flood gets worse. Tell others. Call Triple Zero (000) if your life is in danger. Call the SES on 132500 for flood help. Get full warnings and what you should do at <https://bit.ly/RecandSafety>

FLOOD EMERGENCY WARNING from Sunwater: People near Tomaszuks Rd, Saleyards Rd, Dawson Hwy and Back Creek must LEAVE IMMEDIATELY. Moura Off Stream Storage possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Kianga Hall is safe. Get full warnings and what you should do at Banana Shire Council <http://emd.banana.qitplus.com/>



## Annexe — Moura OSS AWS warning levels mapping

| EAP flood activation trigger | EAP trigger summary                    | Current EAP message (SMS)   | AWS-aligned message (SMS)   | AWS level     |
|------------------------------|--|---|---|---------------|
| ALERT                        | EL 125.19m and rising (0.1m below FSL) | N/A   | ADVICE from Sunwater. Moura Offstream Storage is spilling excess water into Dawson River. People near Tomaszuks Rd, Saleyards Rd, Dawson Hwy and Back Creek should STAY INFORMED and MONITOR CONDITIONS. Water flows from Moura Offstream Storage <b>expected to remain within beds and banks of river / may contribute to widespread/ localised/ overland flooding</b> . Expect increased river flows <b>in 6-12 hours / later today/ overnight/ tomorrow</b> . There is no immediate danger. More information here: <a href="http://bit.ly/RecandSafety">bit.ly/RecandSafety</a>  | n/a           |
| LEAN FORWARD                 | Storage above FSL 125.29m              | N/A   |   |               |
| STAND UP 1                   | Storage above EL 126.29m               | SUNWATER EMERGENCY NOTIFICATION<br>DAM: MOURA OS<br>EVENT: FLOOD<br>STATUS: STORAGE SPILLING<br>ACTION: ACTIVATE YOUR FLOOD PLAN                                  | FLOOD WATCH AND ACT from Sunwater. Excess water spilling from Moura Offstream Storage into Dawson River has increased significantly. Water flows from Moura Offstream Storage may contribute to <b>dangerous/widespread</b> flooding. Expect increased river flows <b>in 6-12 hours / later today/ overnight/ tomorrow</b> . People near Tomaszuks Rd, Saleyards Rd, Dawson Hwy and Back Creek must PREPARE TO LEAVE in case the flood gets worse. Call Triple Zero (000) if your life is in danger. Call the SES on 132500 for flood help. More information here: <a href="http://bit.ly/RecandSafety">bit.ly/RecandSafety</a> | WATCH AND ACT |
| STAND UP 2                   | Storage above EL 126.79m               | SUNWATER EMERGENCY NOTIFICATION<br>DAM: MOURA OS<br>EVENT: FLOOD<br>STATUS: STORAGE SPILLING<br>ACTION: LISTEN TO ABC OR LOCAL RADIO                              |   |               |
| STAND UP 3                   | Storage above EL 127.29m               | IMMINENT FAILURE OF MOURA OFFSTREAM STORAGE<br>TAKE ACTION TO PROTECT LIFE AND LEAVE NOW.<br>AREAS AROUND MOURA ARE AT RISK. INFO ON ABC RADIO.<br>MOURA IS SAFE. | FLOOD EMERGENCY WARNING from Sunwater: People near Tomaszuks Rd, Saleyards Rd, Dawson Hwy and Back Creek must LEAVE IMMEDIATELY. Moura Offstream Storage <b>possible failure/is failing</b> . Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Kianga Hall is safe. More information here: <a href="http://BananaShireCouncil.emd.banana.qitplus.com/">Banana Shire Council emd.banana.qitplus.com/</a>   | EMERGENCY     |
| STAND DOWN                   | Storage level FSL 125.29m and falling  | SUNWATER EMERGENCY NOTIFICATION<br>DAM: MOURA OS<br>EVENT: FLOOD<br>STATUS: DAM HAZARD STOOD DOWN<br>ACTION: NONE   | n/a   | ADVICE        |