EMERGENCY ACTION PLAN — GLENLYON DAM (ID 278)

ISSUE: 7.2 — September 2023 **Expiry:** 1 May 2025

Prepared by **Sunwater Limited**

Controlled Copy No.

Gated: No	Staffed: Yes

Type: Central core earth and rock-fill

Project: Glenlyon Dam EAP **File no.:** 08-000385/001

Address: Glenlyon Dam Road

Location: Lat. -28.964974° Lon. 151.470143°
28°57'53.89"S 151°28"12.51"E

Approved by the delegate of the Chief Executive, Department of Local Government, Water and Volunteers until 1 May 2025.

Emergency activation quick reference

The Emergency Action Plan (EAP) for Glenlyon Dam 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. **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. The DSTDM and FODM are responsible for informing the decision to activate the EAP.**

Table 1: Emergency activation quick reference

Dam Hazards and sections numbers	Alert	Lean Forward	Stand Up	Stand Down
	• Locally managed (DDO) (0.1 m below crest)	• Locally managed (DDO and IC)	• Locally managed (DDO and IC) with advice from ORR/DSTDM	• Locally managed (DDO and IC) with advice from ORR/DSTDM
	Activation triggers for dam hazards			
Flood operations See ***section 5***	• EL 411.63m and rising	• Storage above FSL 411.73m	• Storage above EL 414.02m (Flood of Record — December 2021)	• Storage level EL 412.03m and falling with no forecast increase in EL
Piping: embankment, foundation, or abutments See ***section 6***	• Increasing leakage through an embankment, the foundations, or abutments	• Increasing leakage through an embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Risk assessment has determined that failure risk has reduced
Earthquake See ***section 7***	• Earthquake reported or felt in the area, AND • Intensity less than 5 Modified Mercalli (MM)	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• Earthquake reported or felt in the area, AND • A possible failure path has been identified	• Risk assessment has determined that failure risk has reduced
Terrorist threat/ activity or high energy impact See ***section 8***	• Not applicable	• Not applicable	• Possible terrorist activity noticed at dam or threat received • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit) • Failure in progress or likely due to impact or explosion • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced

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 Glenlyon Dam 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. The DSTDM and FODM are responsible for informing the decision to activate the EAP.**

Table 1 (continued): Emergency activation quick reference

Other Emergency Situations and section numbers	Activation level		
	Communications Failure – Dam Site (DDO)	**Communications Failure – Local Area (LEC/ORR)**	**Communications Failure – Brisbane (IC/DSTDM)**
	• Site managed (DDO - becomes LEC)	• Brisbane managed by Incident Coordinator (IC)	• Locally managed by Local Event Coordinator (LEC)
	Activation triggers for other emergency situations		
Comms Failure **See section 9**	• Unable to communicate to or from Dam site	• Unable to communicate to or from Local Area	• Unable to communicate to or from Sunwater Brisbane

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
[redacted]	EAP Program Lead — Prepared for submission	[redacted]	25/09/2023

Document revision history

Version	Date	Prepared by	Reason for change	Reference #
2	May 2008		Significant changes of Glenlyon Dam Emergency Action Plan to reflect Sunwater Management structure and other minor changes.	HB # 728240
3	February 2012		Significant changes to all sections of Glenlyon Dam Emergency Action Plan to reflect current Sunwater Management structure and other changes.	HB # 1045094
3C	September 2013		Amendments due to new legislative requirements	HB # 1045094
4	August 2016		New Emergency Action Plan developed at expiry of 3E approval. Issued for consultation with Relevant Disaster Management Groups.	HB # 1876448
5	October 2017		New Emergency Action Plan with minor amendments including contact list updates.	HB # 2088669
6	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 # 2088669
6.1	September 2019		Completed yearly contact updates and associated sections, e.g. Organisational chart and Controlled copy holders. Replaced Downstream Notification map with corrected version. Minor non-substantive error corrections, e.g. formatting and spelling.	HB # 2465601
6.2	September 2020		Amended contacts and associated sections, e.g. Organisation chart & Controlled Copy Holders list. Minor error corrections and other non-substantive changes.	HB # 2571777
6.3	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 # 2652833
6.4	October 2021		Corrected DDMG from Texas to Warwick on pages 7 and 9. Corrected DDMG (NSW) to LDMG 1 (NSW) throughout document. Corrected reference to Eungella Dam in Table 28. Updated Controlled document distribution list.	HB # 2661187

Version	Date	Prepared by	Reason for change	Reference #
6.5	September 2022		Amended contacts and associated sections. Minor error corrections and other non-substantive changes. Updated Historical Floods table. Updated value of Flood of Record throughout EAP. 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 # 2725907
7.0	June 2023		Section 3 amended, along with Table B1. Appendix B3 Inundation Maps updated. Incorporated global non-substantive EAP changes resulting from feedback from previous internal and external reviews. Amended references/associated documents list. Minor error corrections and other non-substantive changes to improve readability and useability. Added reference to Fatigue Management Plan, updated AWS messaging. Amended date of previous i7.0 in document revision history.	2743822
7.1	August 2023		Non-substantive map improvements in Appendix B, such as label corrections. Polygon updated. Revised downstream resident notification list in Appendix A. Minor error corrections and other non-substantive changes to improve readability.	2791474
7.2	September 2023		Non-substantive updates as part of Annual Safety Statement. Minor error corrections and readability improvements.	2812220

Controlled document distribution list

Copy #	Position	Location
1	Storage Supervisor	Sunwater, Glenlyon Dam
2	General Manager, South	Sunwater, Goondiwindi
3	Emergency Action Plan Coordinator	Sunwater, Brisbane
4	Local Emergency Coordinator–Inglewood (LDMG 2)	Goondiwindi Regional Council
5	Deputy Local Emergency Coordinator (LDMG 2)	Goondiwindi Regional Council
6	Local Disaster Coordinator & CEO — LDMG	Balonne Shire Council, St. George
7	Principal Project Manager	Department of Regional Development, Manufacturing and Water – Toowoomba
8	Officer in Charge—Stanthorpe Police	Police, Stanthorpe
9	Officer in Charge—Texas Police	Police, Texas

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
Officer in Charge	Police, Inglewood
Emergency Management Coordinator	QFES, Charlton
District Disaster Coordinator (Warwick DDMG 1)	Police, Warwick
Community Planning and Readiness (LDMG 1)	NSW State Emergency Service — State Headquarters, Wollongong NSW
The Controller—SES Tenterfield Unit (LDMG 1)	NSW State Emergency Service, Tenterfield NSW
Officer in Charge—State Emergency Operations Centre (LDMG 1)	NSW Emergency Operations Centre, Surry Hills NSW
Local Disaster Coordinator—Local Disaster Management Group (LDMG 3)	Southern Downs Regional Council
District Disaster Coordinator (Roma DDMG 2)	Police, Roma
Senior Flood Forecaster	Bureau of Meteorology, Brisbane
[redacted] CEO	Border Rivers Commission
Executive Engineer—NSW Dams Safety Committee	NSW Office of Water, Parramatta NSW
Director of Engineering	Moree Plains Sire Council

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

1. References, abbreviations, and definitions

1.1 References/associated documents

Ref.	Document title	Reference/Location
A	Water Supply (Safety and Reliability) Act 2008 (May 2020)	https://www.legislation.qld.gov.au/view/whole/pdf/inforce/current/act-2008-034
B	Emergency action plan for referable dam guideline (RDMW 2021)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0018/84015/eap-guideline.pdf
C	Queensland State Disaster Management Plan 2023 (Queensland's Disaster Management Arrangements)	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0027/339336/Interim-2023-QSDMP-V1.2.pdf
D	Queensland Government arrangements for coordinating public information in a crisis	https://www.disaster.qld.gov.au/dmg/Response/Pages/5-6.aspx
E	Guidelines for the Development of Communication Education, Awareness and Engagement Programs (2010)	https://knowledge.aidr.org.au/media/1970/manual-45-guidelines-for-the-development-of-communication-education-awareness-and-engagement-programs.pdf
F	Queensland Emergency Alert Manual – M.1.174 (February 2022)	https://www.disaster.qld.gov.au/__data/assets/pdf_file/0027/339417/M1174-Queensland-Emergency-Alert-Manual.pdf
G	Sunwater website — Emergency Action Plans, Flood Maps and Dam Emergency Sirens	https://www.sunwater.com.au/community/preparing-for-emergencies/emergency-management/
H	Sunwater website — Emergency Notification Service	https://www.sunwater.com.au/community/preparing-for-weather-events/stay-informed/emergency-notification-service/
I	Professional Engineers Act 2002 (RPEQ)	https://www.legislation.qld.gov.au/view/pdf/inforce/2013-09-23/act-2002-054
K	Standing Operating Procedure (SOP) 12 – Dam Logbooks (Sunwater internal)	SOP12 - Dam Logbooks
L	Sunwater (internal) Strategic Event Procedure	Strategic Event Procedure
M	Queensland Disaster Management Act 2003 (December 2020)	https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2003-091
N	Queensland Disaster Management Guidelines	https://www.disaster.qld.gov.au/dmg/Pages/DM-Guideline.aspx
O	Guidelines on Selection of Acceptable Flood Capacity for Dams (ANCOLD, 2000)	ANCOLD
P	Queensland Dam Safety Management Guidelines (RDMW October 2020)	https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0007/78838/dam-safety-management.pdf
Q	Australian Rainfall and Runoff (ARR) 2019	http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/

Ref.	Document title	Reference/Location
R	Sunwater (internal) Glenlyon Dam Safety Condition Schedule	eDOCS# 988756
S	Sunwater (internal) Glenlyon Dam Operation and Maintenance Manual	Glenlyon Dam O&M Manual
T	Guideline for Failure Impact Assessment of Water Dams (DNRME 2018)	https://www.resources.qld.gov.au/__data/assets/pdf_file/0005/78836/guidelines-failure-impact-assessment.pdf
U	Queensland Rainfall and River Conditions (Flood Warning)	http://www.bom.gov.au/qld/flood/index.shtml?ref=hdr
V	Sunwater (internal) Emergency Alert Protocol	eDOCS# 2156253
W	Fatigue Management Procedure WHS42 (Sunwater internal)	Fatigue Management Procedure
X	SOP 16 Instrumentation, Surveillance and Data Recording (Sunwater internal)	SOP16 Instrumentation, Surveillance and Data Recording

1.2 Abbreviations and acronyms

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

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
Terms set out in section 352A of the *Water Supply (Safety and Reliability) Act 2008 (Qld) - Amended*	
Dam hazard	Means a reasonably foreseeable situation or condition that may: • cause or contribute to the failure of the dam, if the failure may cause harm to persons or property, OR • require an automatic or controlled release of water from the dam, if the release of the water may cause harm to persons or property.
Dam hazard event	Means an event arising from a *dam hazard* if: • persons or property may be harmed because of the event, AND • 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 • the event is not an emergency event.
Disaster management plan	Of a *district group* or local government, means the group's or local government's disaster management plan under the Disaster Management Act.
District group (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 *dam hazard*.

Emergency event	Means an event arising from a *dam hazard* if:
	• persons or property may be harmed because of the event, AND
	• any of the following apply:
	  • a coordinated response, involving 2 or more of the following *relevant entities*, is likely 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, OR
	  • the event may arise because of a disaster situation declared under the Disaster Management Act, OR
	  • an entity performing functions under the State *disaster management plan* may, under that plan, require the owner of the dam to give the entity information about the event.

Local group (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 *dam hazard*.

Term	Definition
Notice response	A dam owner's written response to a notice following an assessment of an EAP by a local government or *district group*.
Referable dam	A dam, or a proposed dam after its construction, will be a referable dam if: • a failure impact assessment (ref T) of the dam, or the proposed dam, is carried out under the Act, AND • 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 • the Chief Executive has, under section 349 of the Act, accepted the assessment. Also, a dam is a referable dam if: • 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 • the Chief Executive has not, under section 349 of the Act, accepted a failure impact assessment of the dam.
Relevant entity	Means each of the following under the EAP for the dam: • 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 farm land adjacent to the dam or residents of a township • each local group and district group for the EAP • each local government whose local government area may be affected if a dam hazard event or emergency event were to happen • the Chief Executive • another entity the owner of the dam considers appropriate e.g., the Queensland Police Service.
Terms consistent with Queensland disaster management arrangements (ref N):	
Activation levels	The four levels of EAP activation are: • **Alert:** 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. • **Lean Forward:** 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. • **Stand Up:** 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.

Term	Definition
	• **Stand Down:** 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. 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. Triggering one of these levels of activation may not necessarily mean a similar activation of LDMGs or DDMGs.
Bureau of Meteorology flood level classifications	The three levels of flooding are: • **Minor flooding:** 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. • **Moderate flooding:** 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. • **Major flooding:** 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.
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 failure	Dam crest flood is when failure occurs during a flood event with the water level at the crest of the non-overflow section of the dam embankment: • for an embankment dam, is the lowest point of the embankment crest • for a concrete dam, is the level of the non-overflow section of the dam, excluding handrails and parapets if they do not store water against them • for a concrete faced rockfill dam, is the lowest point of the crest structure.
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	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: • settlement, sliding, or overturning of monoliths in the dam wall

Term	Definition
	• initiation of seepage lines in the foundations or abutments that could lead to piping damage and potential inoperability of appurtenant works (additional structures such as spillways).
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	Probable maximum flood is the flood resulting from probable maximum precipitation coupled with the worst catchment conditions that can be realistically expected.
Probable maximum precipitation	Probable maximum precipitation is the theoretical greatest depth of precipitation physically possible based on generalised methods.
Probable maximum precipitation design flood	Probable maximum precipitation design flood is the flood resulting from probable maximum precipitation coupled with standard catchment conditions that can be expected.
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 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 situation 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 A), 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, or piping risk):

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 governments whose areas may be affected by a dam hazard for Glenlyon Dam have been determined as **SES State Operations Communication Centre (NSW)**, **Goondiwindi Regional Council (QLD), Balonne Shire Council** and **Southern Downs Regional Council (QLD)**. Sunwater has provided all four local governments 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 groups for Glenlyon Dam are **Warwick District Disaster Management Group and the Roma District Disaster Management Group (DDMG)**. Sunwater has provided the DDMGs 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 Glenlyon Dam 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 Glenlyon Dam 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 Glenlyon Dam by the manager 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 SES State Operations Communication Centre, Goondiwindi Regional Council, Balonne Shire Council and Southern Down Regional Council's Local Disaster Management Plans.

2.3 Scope.

The Glenlyon Dam EAP covers:

- emergency conditions evaluated within Sunwater's Dam Safety Management Program
- details about the dam that are relevant to a dam hazard or an emergency event happening
- triggers for activation of a tiered response to dam hazards or an emergency event happening
- roles and responsibilities in responding to an emergency event
- notification 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 or an emergency event, and the management of emergency events at Glenlyon Dam.

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. The training is presented to relevant Sunwater staff (DDOs, LEC and IC's) and disaster management stakeholders. DSTDM and FODM information sessions are carried out once a year with the same walkthrough of new changes and Q & A, (but not specific to any one dam). New Sunwater employees in these various roles have a walkthrough of the EAP.

Sunwater works towards carrying out a full test once annually involving each local council. 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.

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 Principles used in developing this EAP

In Queensland, the LDMG has principal carriage of managing any emergency within the community, with the support of the district and state groups.

In NSW, the State Emergency Service (SES) is the primary contact, and their response is controlled through Local Flood Plan/s with reference to DEP for potential inundation areas.

Sunwater will aim to inform and support the LDMG in the Goondiwindi, Southern Downs and Balonne council areas.

The LDMG will be the principal voice on all communication to the community during an emergency where practical.

During a dam emergency event (definition page 3) that occurs with little or no warning, Sunwater will undertake the following actions to ensure the community is informed as soon as possible:

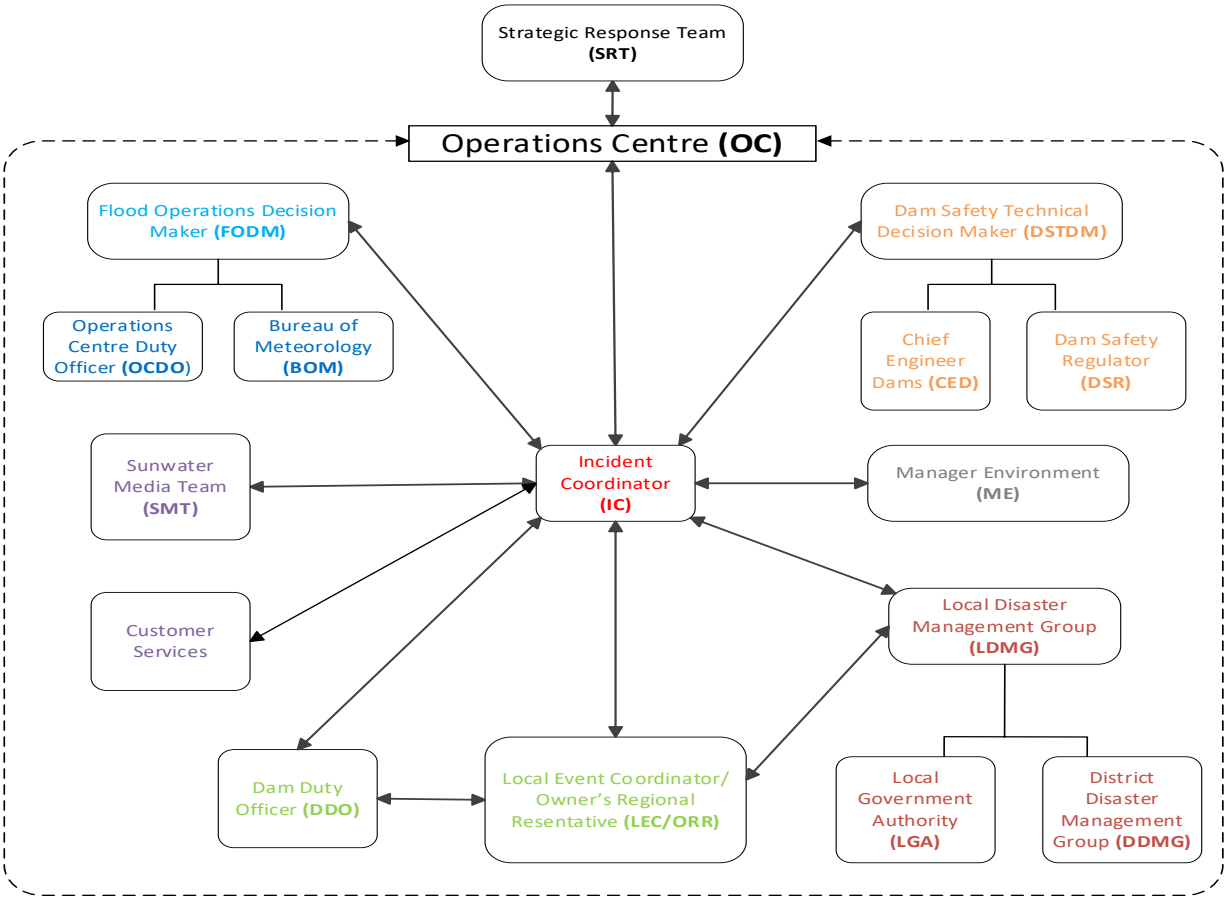
- maintain an up-to-date list of immediate D/S residents of Glenlyon Dam. The downstream limit is shown in the plan in Appendix B2 by the zone labelled *Limit of downstream notification area*
- provide timely advice to the LDMGs
- notify the immediate D/S residents via SMS
- contact SDCC Watch desk to send emergency notification to the Glenlyon Dam Emergency polygon.

Sunwater will aim to inform and support the District Disaster Management Group for Warwick and Roma.

2.6.1 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



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 of Queensland.

2.7 Community information

Sunwater with the assistance of the local councils 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, Sunwater App and at several regional show/field days across regional Queensland where Sunwater may have stalls and information available.

Immediately downstream residents of Glenlyon Dam 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 in accordance with the Queensland Emergency Alert Manual (ref F). 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 (ref G). 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 (ref H) or by calling Sunwater Customer Enquiries on 13 15 89.

3. Dam details

3.1 General dam information

Location: Glenlyon Dam is located on Pike Creek approximately 6.4 km upstream of its junction with the Dumaresq River. It is located 70 km west of Tenterfield.

Purpose: Glenlyon Dam was constructed to provide a source of regulated water for the Dumaresq Macintyre and Barwon Rivers, which form part of the border between Queensland and New South Wales.

Dam Description: The dam consists of a 445 m long earth and rock-fill embankment with a central clay core. The upstream face of the embankment keys into the low-level coffer dam. The spillway located right abutment consists of an open-cut rock channel, a 75 m wide concrete-lined chute with a low-crest reinforced concrete ogee spillway.

Construction: Glenlyon Dam was designed by the Water Conservation and Irrigation Commission (NSW) in the early 1970s and constructed by the Irrigation and Water Supply Commission (QLD) between 1972 and 1976 on behalf of the Dumaresq-Barwon Border Rivers Commission (BRC). The BRC was established in 1946 between the New South Wales and Queensland Governments to facilitate water infrastructure developments and water sharing arrangements in the Queensland-New South Wales border region. The Glenlyon Dam project was jointly funded by the New South Wales and Queensland Governments.

Ownership and Operation: Glenlyon Dam is owned by the Dumaresq-Barwon Border Rivers Commission (BRC) and operated by Sunwater.

Specification: The table below lists general specifications of Glenlyon dam.

Table 2: Glenlyon Dam specifications

Description	Specification
Dam type	**Central core earth and rock-fill**
Full Supply Level (FSL)	EL 411.73 m
Dam Crest Level (DCL)	EL 423.62 m
Catchment area	1,295 km^2
Storage capacity (FSL)	254,000 ML
Surface area (FSL)	1,750 Ha
Historical recorded max storage—Dec 2021	EL 414.02 m (first filling conditions will apply above this level) *
Dam Crest Flood (DCF)	1 in 500,000 AEP (2023 Hydrology)
Embankment	
Max embankment height (from lowest general foundation level)	62 m
Embankment Crest width	10.6 m
Embankment length	445 m
Total embankment length (m)	519 m
Embankment Crest level	423.62 m
Spillway	**Reinforced concrete ogee crest**

Description	Specification
Spillway crest level	EL 411.73 m
Spillway crest length	74.4 m
Spillway capacity	547,171 ML/d or 6,333 m^3/s (2023 Hydrology)
Maximum Spillway depth at DCF	11.89 m
Outlet works	
Outlet capacity (max)	2,500 ML/d (28.94 m^3/s)
Type	Inlet tower (wet) 3,660 mm I.D. concrete tunnel reducing to 2,150 mm I.D. steel conduit
Control	Hydraulically operated 60" FCDV with 84" BFV isolator and 24" FCDVs with 24" BFV (D/S) Drop inlet bulkhead gate in tower (U/S)
Minimum drawdown level	EL 368.4 m
Total Length	254 m
Butterfly Valve	2,130 mm diameter
Cone Valve	1,525 mm diameter
Max. Outlet capacity	2,500 ML/d (28.94 m^3/s)

All levels are to Australian Height Datum (AHD) unless otherwise stated. Conversion from State Datum to AHD is -0.36 m.

*First-filling conditions are when the storage level is above the historical maximum, and is rising at a rate of rise equal to or greater than 300 mm/d. The dam should be inspected at 4-hourly intervals.

3.2 Population at risk

The 2017 Failure Impact Assessment (FIA) estimated the highest total Population at Risk (PAR) for Glenlyon Dam is 650 for a Sunny Day Failure and 3,477 for the PMF Failure event.

In determining the PAR, assumptions were made regarding the concurrent flooding downstream of Glenlyon Dam. The Sunny Day Failure assumed no concurrent flooding, while the Probable Maximum Flood assumed a 1% AEP rainfall event over the entire downstream catchment to Goondiwindi.

Following the 2017 FIA, Sunwater conducted an updated evaluation of dam break scenarios as part of an updated Comprehensive Risk Assessment (CRA) finalised in May 2023. While PAR estimates are similar between the two studies, there is a distinction regarding the extent of the potential failure impact zone.

In the 2017 assessment, the projected failure impact zone extended to Mungindi, located beyond Goondiwindi on the border between Queensland and New South Wales. However, in the 2023 CRA, the dam failure extent was limited to approximately 50 km west of Goondiwindi. This adjustment was made because the inclusion of the additional PAR downstream to Mungindi would not significantly alter the overall societal risk of the dam since most of the PAR is upstream of Mungindi. Implementing a downstream extent at Mungindi would also necessitate substantial enhancements in floodplain modelling. Consequently, the 2023 CRA presents a more restricted failure impact zone, reflecting the decision to focus on areas with higher potential consequences.

Considering the broader downstream impact zone and the inclusion of more at-risk population in the 2017 Failure Impact Assessment, the maps from the 2017 assessment have been incorporated into this Emergency Action Plan. These maps offer a more comprehensive overview of potential floodplain impacts and hold greater utility within an emergency management context.

3.3 General Arrangement

The general arrangement drawings are in Appendix B.

3.4 Emergency inspections and monitoring

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

3.4.1 Inspections

- **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

To confirm the structural behaviour and safety of the embankment, the following instrumentation was installed, and is monitored, at Glenlyon Dam.

Main Dam

- **Settlement/movement measurement**
  - 1 electric settlement installation with 37 cross-arms (at approx. 1.5 m intervals within the embankment core). The settlement readings of the individual cross-arms have not been recorded since 2009 and are no longer in use. The 2014 five-yearly comprehensive inspection report outlines the reasoning (Section 4.3)
- **Seepage measurement**
  - 4 v-notch weirs—located on the left and right abutments and in the toe of the downstream embankment near the piezometer terminal well (refer to drawing 224201)
- **Piezometers**
  - 16 hydraulic piezometers (piezometer gauge three is out of service) in the core, upstream, and downstream filter zones (refer to drawing 224201)
- **Survey points**
  - 39 survey points (refer to drawing 224201)

The location of instrumentation and monitoring equipment is listed in Appendix B.

CCTV remote monitoring camera

The dam is regularly monitored by physically inspecting the structure and reading instruments that record water storage levels. The storage is surveyed every year using defined points to determine whether any movement has occurred. Regular surveillance is by way of a remote camera installation that provides images of the dam and spillway capable of real time processing.

4. Roles and responsibilities

Roles and responsibilities	Position holder
Owner • Liaise with the Board and Minister • Activate Sunwater Strategic Event Procedure and Business Continuity Plans if required • Ensure necessary resources are available to manage any event • Record communications, notifications and observations as required	CEO EGMO EGME&WR
Owner's Head Office Representative • Authorise the issuing of EAPs, SOPs and O&M Manuals and Amendments • 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 • Ensure that risks identified in CRAs or other technical reports undertaken in relation to dam safety are included in the EAP • Ensure visual inspections and instrumentation monitoring frequencies conform to ANCOLD Guidelines • Ensure all dam safety work orders, work instructions and lesson learned outcomes are fully implemented. • Ensure requirements of the Dam Condition Schedule (ref R) are met • Ensure the work instructions are correct and the logbooks, SOPs, Data Books, and EAPs are reviewed annually as per the Condition Schedule (ref R) • Undertake and prepare the five yearly Comprehensive Inspection Reports with suitably qualified personnel within the time specified in the Condition Schedule (ref R) and that work orders are created for recommendations and work is undertaken as required • Undertake Annual Inspections and prepare reports within the time frames specified in the Condition Schedule (ref R) and that work orders are created for recommendations and work is undertaken as required • Review the Dam Safety Instrumentation Database and evaluate data to verify the structural integrity of the dams on a regular basis and maintain a spreadsheet for verification for audit and quality control • Record communications, notifications and observations as required	GM Asset Integrity GM Asset Management
Owner's Regional Representative (ORR) • Liaise with the Storage Supervisor/Operator Maintainer • Arrange dam specific training and accreditation for relevant staff • Ensure competent, trained and accredited personnel operate the storages • Undertake the role of LEC as required • Ensure all work orders, work instructions and lesson learned outcomes are fully implemented • Record communications, notifications and observations as required.	GM South OCO OS
Technical Advisor • Analyse the situation and provide expert technical advice • Discuss issue with peers and other technical experts and make sound decisions to mitigate the risk • Determine response to incidents and emerging issues • Record communications, notifications and observations as required	ME

Roles and responsibilities	Position holder
Dam Safety Technical Decision Maker (DSTDM) • Maintain current RPEQ accreditation • Analyse the situation and provide expert technical advice in relation to Dam Safety • Discuss Dam Hazard with peers and other technical experts and make sound decisions to mitigate the risk • Determine response to incidents and emerging issues • Issue warning on dam failure and advise on protective measures • Ensure the EAP is implemented appropriately and carry out the DSTDM role as required • Liaise with Regulator as required • Record communications, notifications and observations as required	Various personnel as per DSTDM roster
Flood Operations Decision Maker (FODM) • Maintain current RPEQ accreditation • 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 • Interpret and apply rainfall data in accordance with the OC SOP, including, as required under the OC SOP, liaising with BOM • Ensure the EAP is implemented appropriately and carry out the FODM role as required • Record communications, notifications and observations as required	Various personnel as per FODM roster
Operations Centre Duty Officer (OCDO) • Decide if a flood is imminent and record modes of operation • Extract data relative to the event from available sources • Utilise this data in predictive flood models and determine results from these models for approval by FODM • Liaise with the FODM or IC to update current flood situation and routing data • Record communications, notifications and observations as required	Various personnel as per OC roster
Sunwater Media Team (SMT) • Analyse sensitive issues, discuss with the Owner and issue media releases • Handle public and customer comments (including social media) and advise the Owner if necessary • Liaise with the IC and update SDMG of flood events • Record communications, notifications and observations as required	Various personnel as per Media Team roster
Incident Coordinator (IC) • Notify LDMGs, or councils if LDMGs not Stood Up, of intent to use the Emergency Alert (EA) • Activate the EAP • Ensure the EAP is implemented appropriately and carry out the IC role as required • Arrange Situation Reports and determine frequency as required • Record communications, notifications and observations as required	Various personnel as per IC roster
Local Event Coordinator (LEC) • Liaise with the Local Disaster Coordinator or proxy • Activate the EAP, when necessary • Ensure the EAP is implemented appropriately and carry out the LEC role as required	Various personnel as per LEC roster

Roles and responsibilities	Position holder
• Record communications, notifications and observations as required	
Dam Duty Officer (DDO) • Complete accreditation to operate and maintain relevant storage • Ensure the EAP is implemented appropriately and carry out the DDO role as required • Take direction from the DSTDM and IC as requested • Arrange immediate site inspection and make informed assessment of the situation • Escalate any issue not covered in the EAP or where actions are not clear • Record communications, notifications and observations as required	SOM SS OM
SES State Operations Communications Centre (NSW), Goondiwindi Regional Council, Balonne Shire Council and Southern Downs Regional Council Councils have legislated local government functions, as per Section 80 of Queensland Disaster Management Act 2003 (ref M). . These include: • Ensure it has a disaster response capability • Approve its local disaster management plan • 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 • Perform other functions given to the local government under the Act • Assess (in consultation with its LDMG) the EAP for consistency with the Local Disaster Management Plan	
Disaster Management Groups/Personnel - (In addition to requirements outlined in the *Disaster Management Act (2003)*) LDMG • As per IGEM review recommendation; work together with Sunwater and the councils to ensure consistent community education around messaging and impacts of EAP related events is undertaken and continually improves • Work with councils and Sunwater to ensure the EAP is regularly exercised • 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 councils to initiate • During a dam hazard event, **providing they are Stood Up**, the LDMGs in the affected local government areas will take the lead role in notifying the broader community • Identify and provide advice to the relevant DDMGs about support services required by the LDMG to manage an EAP event • Provide reports and make recommendations to the relevant DDMGs about matters relating to EAP events QFES • Work with dam owner and LDMGs to ensure Emergency Alert polygons are prepared, stored, and tested at the State Watch Desk And as per Section 352HC of the *Water Legislation (Dam Safety) Amendment Act (2017)*: DDMG • May review the EAP for consistency with the District Disaster Management Plan	LDMG QFES DDMG
Dam Safety Regulator (DSR) • Liaise with relevant Minister on necessary actions. • Approve this document as required under legislation	DDS

Roles and responsibilities	Position holder
• Liaise with Chief Executive as required in administering (regulating) the Water Supply (Safety and Reliability) Act 2008	

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 Glenlyon Dam to FSL 411.73m and the rate of inflow exceeds the capacity of the outlet works. The spillway will then discharge water downstream into Pike Creek and subsequently the Dumaresq River. These flood flows can create a dam hazard. Inflows will also cause the storage to temporarily rise to above the full supply level 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:

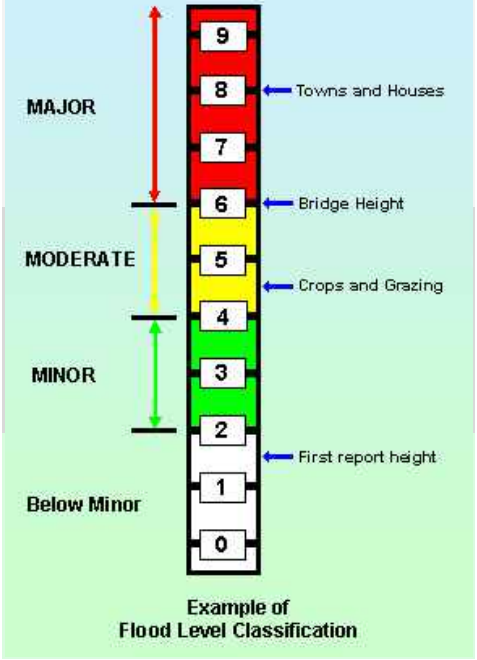
- For small flows, the water will be contained within Pike Creek and the Dumaresq River and will not create a dam hazard.
- As the rate of discharge increases, there will be an impact on low-level road crossings of Pike Creek, the Dumaresq River, and other infrastructure in the river such as pump sites.

Users should note the existence of local flood plans for the following councils:

- Tenterfield Shire Local Flood Plan
- Moree Plains Local Flood Plan
- Inverell Shire Local Flood Plan.

These are available on the www.ses.nsw.gov.au website.

Table 3: Flood classification triggers

	Flood Classification Level	Depth over Spillway (m)	Storage Elevation (m AHD)
	Major	2.0	413.73
	Moderate	1.8	413.54
	Minor	1.5	413.23

Source: Bureau of Meteorology

The following table shows historical floods experienced at Glenlyon Dam.

Table 4: Historical floods experienced at Glenlyon Dam

Flood rank	Date	Peak Height (EL m AHD)	Peak Height (m over FSL)
1	Dec 2021	414.02	2.29
2	Jan 2011	413.54	1.81
3	Mar 2022	412.32	0.59
4	Oct 2011	412.29	0.56
5	Feb 2022	412.25	0.52

5.2 Emergency actions

In the table below, 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

Alert	• EL 411.63m and rising (0.1 m below crest)
Lean Forward	• Storage above FSL 411.73m
Stand Up—greater than Flood of Record	• Storage above EL 414.02m (Flood of Record — December 2021)
Stand Up—2	• Storage above EL 418.00m
Stand Up—3	• Storage above EL 422.00m
Stand Down	• Storage level EL 412.03 m and falling with no forecast increase in EL

While this EAP is not triggered until Glenlyon Dam reaches a level of 411.63 m, Sunwater and LDMGs in both QLD and NSW 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 need to use 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 (Sunwater internal).

5.2.2 Emergency action roles

Table 6 to Table 11 specify emergency actions for the following roles:

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

Table 6: Flood operations—DDO emergency action						
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—greater than Flood of Record**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**White Alert**	**Amber**	**Red**	**All clear**
Activation trigger	• EL 411.63m and rising (0.1m below FSL)	• Storage above FSL 411.73m	• Storage above EL 414.02m	• Storage above EL 418.00m	• Storage above EL 422.00m	• Storage Level EL 412.03m and falling with no forecast increase in EL
Actions	• Record all communication • Inspect the dam daily (or as instructed by the DSTDM) and photograph/video and record using approved forms • Undertake site preparations including but not limited to: – check fuel and operation of backup generator – check operations of sump pump – check communication systems (including backup radio, satellite, phones, fax, and internet) • Monitor catchment conditions and the gauge board to verify calibration of gauging station • Notify the SO • Record the storage level twice daily (or as instructed by the ORR/DSTDM) • Carry out Instrumentation and data readings (if applicable and safe to do so) as per SOP 16 (ref X) • Record rainfall daily • Update Dam Logbook as SOP 12 (ref K)	• As per previous activation level, AND • Inspect the dam daily (or as instructed by the DSTDM) and photograph/video and record using approved forms. Attention will be given to: – visual inspection of flow patterns over spillway and dissipator for evidence of scouring – inspect embankment for leaks, deformation, and scour – obvious signs of seepage • Report any unusual readings or observations to the DSTDM and IC as soon as practical • Carry out instrumentation and data readings (if applicable and safe to do so) as per SOP 16 (ref X) • Photograph spillway discharge area	• As per previous activation level, AND • Inspect the dam 6 hourly (or as instructed by the DSTDM) and photograph/video and record using approved forms • Read dam instrumentation daily (or as instructed by the DSTDM)	• As per previous activation level, AND • Monitor and record river height at the tailwater gauge (twice daily or as requested) • Monitor tailwater and photograph any turbulent areas	• As per previous activation level, AND • Remotely inspect the dam 6 hourly (or as instructed by the or as instructed by the DSTDM) and photograph/video and record using approved forms • Photograph the spillway and tailwater areas (several times a day)	• Forward information for EER to IC email • Return to routine surveillance activities and frequencies—inspect the dam for any damage identified • Update Dam Logbook as per SOP 12 (ref K)
Notifications	1. IC 2. SO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • DSTDM

Table 7: Flood operations—LEC emergency action						
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—greater than Flood of Record**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**White Alert**	**Amber**	**Red**	**All clear**
Activation trigger	• EL 411.63m and rising (0.1m below FSL)	• Storage above FSL 411.73m	• Storage above EL 414.02m	• Storage above EL 418.00m	• Storage above EL 422.00m	• Storage Level EL 412.03m and falling with no forecast increase in EL
Actions	• Record all communication • Develop/implement staff roster	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	1. IC 2. DDO 3. LDMG 1 4. LDMG 2 5. LDMG 3 6. LDMG 4	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

Table 8: Flood operations—IC emergency action						
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—greater than Flood of Record**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**White Alert**	**Amber**	**Red**	**All clear**
Activation trigger	• EL 411.63m and rising (0.1m below FSL)	• Storage above FSL 411.73m	• Storage above EL 414.02m	• Storage above EL 418.00m	• Storage above EL 422.00m	• Storage Level EL 412.03m and falling with no forecast increase in EL
Actions	• **Liaise with Sunwater Customer Support to send SMS to D/S residents** • Record all communication • Obtain catchment conditions from the DDO • Advise the DDO of anticipated rainfall/inflows • Refer to Local Flood Plans as required (see below)* • Create Incident Report Record • **Update Sunwater intranet with dam status**	• As per previous activation level, AND • Ensure all abnormal observations or damage have been reported to DSTDM • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level	• As per previous activation level, AND • When approaching EL 422.00m, ensure staff are relocated to a safe location	• As per previous activation level	• Deactivate EAP • Compile EER and deliver to DSR if required • Close Incident Report Record • **Update Sunwater intranet with dam status** • Return to routine activities
Notifications	1. D/S Residents 2. DDMG 1 3. DDMG 2 4. LDMG 1 (NSW) 5. LDMG 2,3,4 6. DDO 7. DSTDM 8. LEC/ORR 9. NSW SES 10. SMT 11. SRT	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level AND SDCC Watch Desk	• Inform previous notifications of deactivation as required

*Tenterfield Shire Local Flood Plan, Moree Plains Local Flood Plan & Inverell Shire Local Flood Plan are available on the www.ses.nsw.gov.au

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

Table 9: Flood operations—LEC & IC communication plan					
Activation level - QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert	**White Alert**	• When EL 411.63m and rising	• **LDMG 1 (NSW)** • **LDMG 2** • **LDMG 3** • **LDMG 4** • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? What is the status? Advise of current storage level
			• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
Lean Forward	**White Alert**	• Storage above FSL 411.73m	• **LDMG 1 (NSW)** • **LDMG 2** • **LDMG 3** • **LDMG 4** • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? What is the status? Advise of current storage level
			• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 9 (continued): Flood operations—LEC & IC communication plan					
Activation level - QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Stand Up—greater than Flood of Record	**White Alert**	• Storage above EL 414.02m	• **LDMG 1 (NSW)** • **LDMG 2** • **LDMG 3** • **LDMG 4** • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? What is the status? (storage is greater than Flood of Record) Advise of current storage level Advise of any forecasts you are aware of
			• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
Stand Up—2	**Amber**	• Storage above EL 418.00m	• **LDMG 1 (NSW)** • **LDMG 2** • **LDMG 3** • **LDMG 4** • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? What is the status? Advise of current storage level Advise of any forecasts you are aware of
			• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
Stand Up—3	**Red**	• Storage above EL 422.00m	• **LDMG 1 (NSW)** • **LDMG 2** • **LDMG 3** • **LDMG 4** • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? What is the status? Advise of current storage level Advise of any forecasts you are aware of
			• SDCC Watch Desk	• Email & Phone	Complete Emergency Alert Request Form as per instructions (copies in Appendix A7) and email to SDCC Watch Desk to send.
			• D/S Residents	• SMS (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 9 (continued): Flood operations—LEC & IC communication plan					
Activation level - QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Stand Down	**All Clear**	• Storage level EL 412.03m and falling with no forecast increase in EL	• **LDMG 1 (NSW)** • **LDMG 2** • **LDMG 3** • **LDMG 4** • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? What is the status? (storage is greater than minor flood level, as set by BOM) Advise of current storage level Advise EAP has been deactivated
			• D/S Residents (if from Stand Up)	• SMS (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 10: Flood operations—DSTDM emergency action						
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—greater than Flood of Record**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**White Alert**	**Amber**	**Red**	**All clear**
Activation trigger	• EL 411.63m and rising (0.1m below FSL)	• Storage above FSL 411.73m	• Storage above EL 414.02m	• Storage above EL 418.00m	• Storage above EL 422.00m	• Storage Level EL 412.03m and falling with no forecast increase in EL
Action	• Record all communication • Provide technical advice to DDO and IC on a needs basis • Review surveillance reports and determine if any additional responses are required • Refer to Local Flood Plans as required (see below)*	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	1. DDO 2. IC 3. DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • CEO—if time permits	• As per previous activation level

*Tenterfield Shire Local Flood Plan, Moree Plains Local Flood Plan & Inverell Shire Local Flood Plan are available on the www.ses.nsw.gov.au

Table 11: Flood Operations – FODM emergency action						
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—greater than Flood of Record**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**White Alert**	**Amber**	**Red**	**All clear**
Activation trigger	• EL 411.63m and rising (0.1m below FSL)	• Storage above FSL 411.73m	• Storage above EL 414.02m	• Storage above EL 418.00m	• Storage above EL 422.00m	• Storage Level EL 412.03m and falling with no forecast increase in EL
Action	• Provide technical advice to DDO, DSTDM and IC on a need basis. • Inform IC of any EAP decisions made. • Review SDCC reports and determine if any additional responses are required. • Undertake inflow assessment as per the OC SOP and update as necessary. • Update and issue Status Updates if required. • Record all communication and decisions made	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	1. IC 2. DDO 3. DSTDM 4. BOM	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level, AND • CEO—if time permits	• As per previous activation level

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), 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 maybe 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 indicate 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 12 to Table 16 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

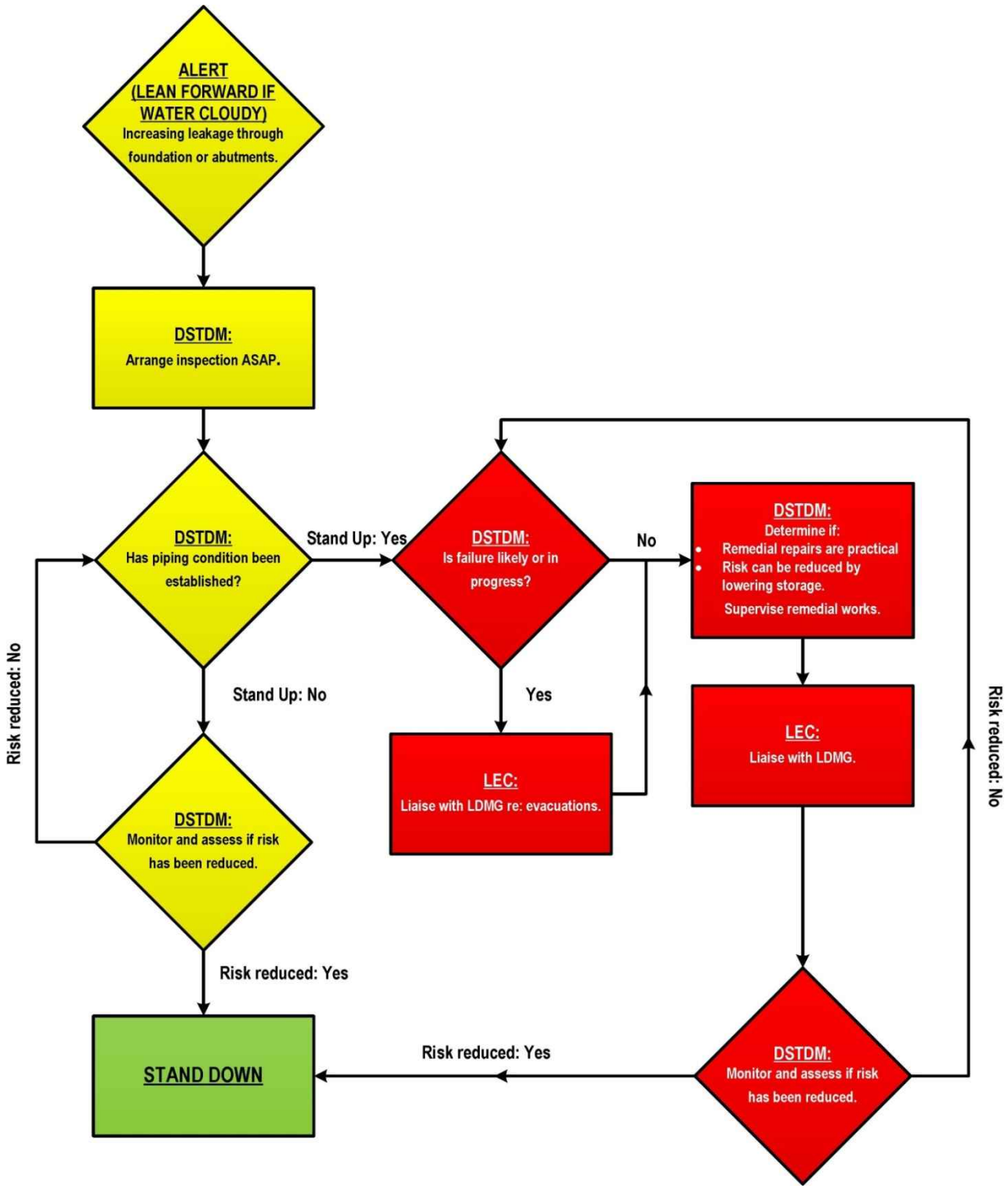


Table 12: Piping: embankment, foundation, or abutments-DDO emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication • Monitor flows every 6 hours (or as otherwise instructed by the DSTDM) until a decreasing trend is observable, or as directed by the IC • Photograph/video the piping from a safe point and record using the approved forms and send to DSTDM and IC • Notify SO • Update Dam Logbook as per SOP 12 (ref K)	• As per previous activation level	• As per previous activation level, AND • Support/supervise remedial works as required • Close any affected roads if not already closed by others • Maintain surveillance of area immediately downstream of dam (if safe to do so) and move on any members of the public	• As per previous activation level, AND • Vacate the immediate vicinity of the piping condition	• Forward information for EER to IC email • Update Dam Logbook as per SOP 12 (ref K) • Return to routine activities
Notifications	1. DSTDM 2. IC 3. SO	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

Table 13: Piping: embankment, foundation, or abutments-LEC emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication	• As per previous activation level	• As per previous activation level, AND • Liaise with relevant council(s) regarding potential road/bridge closures	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	1. IC 2. DDO 3. LDMG 1 4. LDMG 2 5. LDMG 3 6. LDMG 4	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

Table 14: Piping: embankment, foundation, or abutments—IC emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations, or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Actions	• Record all communication • Create Incident Report Record • Update Sunwater intranet with dam status	• As per previous activation level, AND • Investigate availability of machinery and materials (if insufficient stockpiles available) • Place machinery operators on standby if directed by DSTDM • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level, AND • Mobilise resources to undertake remedial works if directed by DSTDM	• As per previous activation level	• Deactivate EAP • Compile EER and deliver to DSR if required • Close Incident Report Record • Update Sunwater intranet with dam status • Return to routine activities
Notifications	1. DSTDM 2. DDO 3. LEC/ORR 4. NSW SES 5. SMT 6. SRT	• As per previous activation level, AND 1. DDMGS 2. LDMG 1 (NSW) 3. LDMG 2, 3, 4	• As per previous activation level, AND 1. D/S Residents 2. SDCC Watch Desk	• As per previous activation level	• Inform previous notifications of deactivation as required

Table 15: Piping: embankment, foundation, or abutments—IC communication plan					
Activation level - QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert	**White Alert**	• Increase in leakage through an embankment, the foundations, or abutments	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Unconfirmed piping risk)* What is the status? *(Unconfirmed leakage—Investigation continues)* Advise of current storage level Advise any issues you are aware of Standby for further advice
Lean Forward	**White Alert**	• Increase in leakage through an embankment, the foundations, or abutments with cloudy water	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Unconfirmed piping risk)* What is the status? *(Unconfirmed leakage—Investigation continues)* Advise of current storage level Advise any issues you are aware of Standby for further advice
Stand Up—1	**Amber**	• Piping condition has been established	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Confirmed piping risk)* What is the status? *(Confirmed piping/leakage)* Advise of current storage level Advise any issues you are aware of. Discuss any potential road/bridge closures Prepare for possible evacuations
			• 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 15 (Continued) Piping: embankment, foundation, or abutments—IC communication plan					
Activation level - QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Stand Up—2	**Red**	• Failure likely due to piping, AND • Sufficient water in storage to create a dam hazard	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Confirmed piping risk)* What is the status? *(Possible Dam Failure)* Advise of current storage level Prepare coordinated evacuations
			• 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
		• Dam failure in progress	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? (Confirmed piping risk) What is the status? (Dam Failure In Progress) Advise of current storage level 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
Stand Down	**All Clear**	• Risk assessment has determined that piping risk has reduced	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES • SDCC Watch Desk	• Phone	Describe current situation with Dam—What is the event? *(Dam Safety Risk—piping)* What is the status? *(Dam Hazard Stood Down)* Advise risk assessment has determined that piping risk has reduced and EAP has been deactivated
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 16: Piping: embankment, foundation, or abutments—DSTDM emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Increasing leakage through the embankment, the foundations, or abutments	• Increasing leakage through the embankment, the foundations or abutments with cloudy water	• Piping condition has been established	• Failure in progress or likely due to piping, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that piping risk has reduced
Action	• Record all communication • Arrange an inspection of the dam to assess its condition as soon as possible, when safe to do so • Determine if piping condition has been established • Monitor situation and assess risks	• As per previous activation level	• As per previous activation level, AND • Assess risk and determine if failure likely or in progress • Determine if remedial repairs are practical • Determine if risks can be reduced by lowering storage • Supervise* remedial repairs (if applicable)	• As per previous activation level, AND • Liaise with the IC and advise on need to recommend evacuations	• Forward information for EER to IC email • Return to routine activities
Notifications	1. DDO 2. IC 3. DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

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

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), 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 17 to Table 21 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

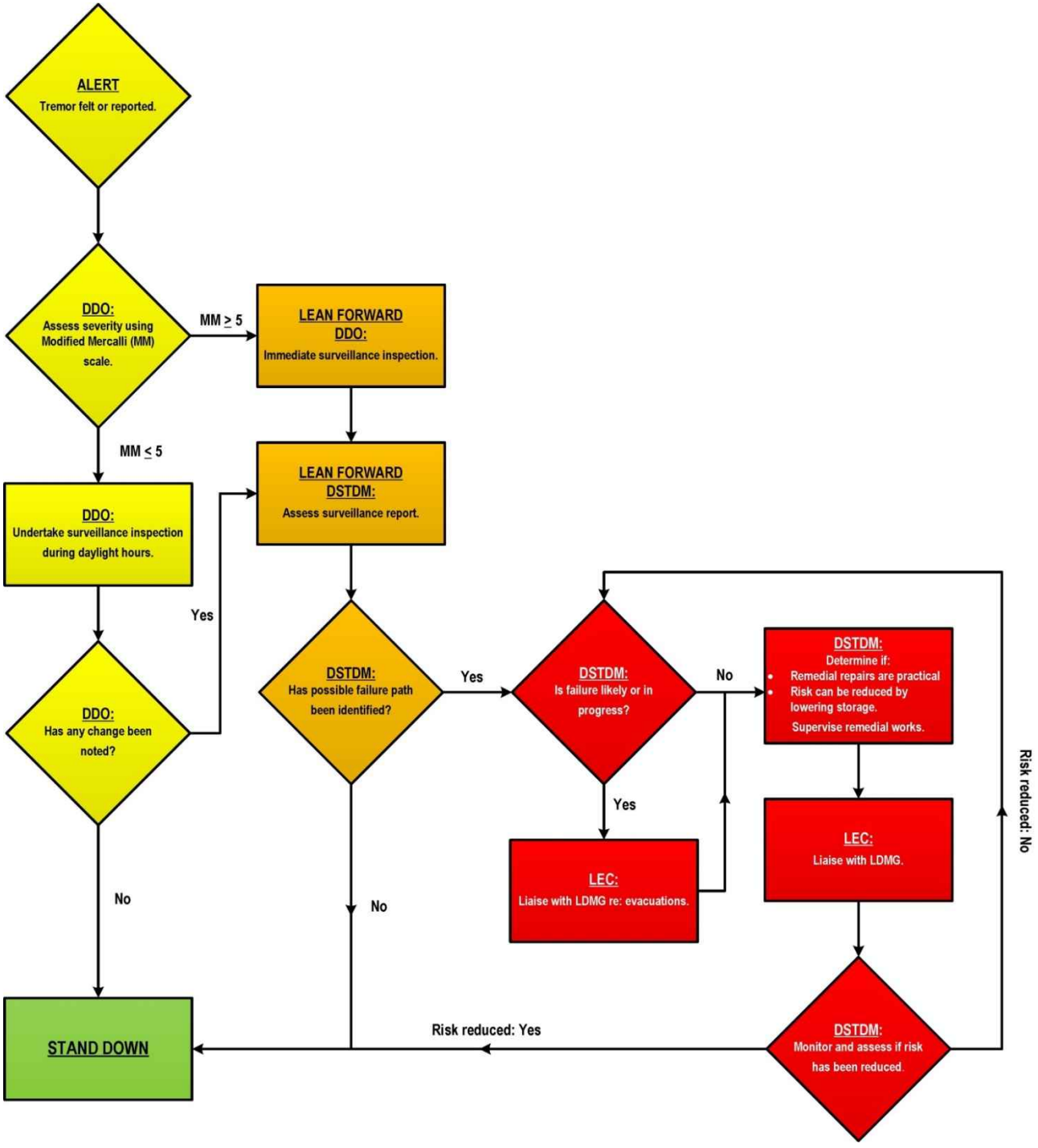


Table 17: Earthquake—DDO emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Earthquake reported or felt in the area, AND • Intensity less than 5MM*	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM*, OR • Intensity less than 5MM and change detected during surveillance inspection	• Earthquake reported or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• Record all communication • Immediately inspect the embankment, spillway structure, abutments in daylight hours (if safe to do so) and report to the DSTDM and IC—photograph/video and record using approved forms and send to DSTDM and IC • Check for leaks, deformation, scour, and concrete damage • Update Dam Logbook as per SOP 12 (ref K)	• As per previous activation level, AND • Repeat the inspection as directed	• As per previous activation level, AND • Support/supervise remedial work as required • Close any affected roads, if not already closed by others • Maintain surveillance of area immediately downstream of dam (if safe to do so) and move on any members of the public • Record/photograph the damage from a safe point • Vacate the immediate vicinity of the embankment	• As per previous activation level	• Forward information for EER to IC email • Update Dam Logbook as per SOP 12 (ref K) • Return to routine activities
Notifications	1. DSTDM 2. IC	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

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

Table 18: Earthquake—LEC emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Earthquake reported or felt in the area, AND • Intensity less than 5MM	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• Earthquake reported or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• Record all communication	• As per previous activation level	• As per previous activation level, AND • Liaise with relevant Council(s) regarding potential road/bridge closures	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	1. IC 2. DDO 3. LDMG 1 4. LDMG 2 5. LDMG 3 6. LDMG 4	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

Table 19: Earthquake—IC emergency action					
QLD Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Earthquake reported or felt in the area, AND • Intensity less than 5MM	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• Earthquake reported or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Actions	• Record all communication • Create Incident Report Record • Update Sunwater intranet with dam status	• As per previous activation level, AND • Investigate availability of machinery and materials (if insufficient stockpiles available) • Place machinery operators on standby if directed by DSTDM • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level, AND • Mobilise resources to undertake remedial works if directed by DSTDM	• As per previous activation level	• Deactivate EAP • Compile EER and deliver to DSR as required • Close Incident Report Record • Update Sunwater intranet with dam status • Return to routine activities
Notifications	1. DDO 2. DSTDM 3. LEC/ORR 4. NSW SES 5. SMT 6. SRT	• As per previous activation level, AND 1. DDMG 1 2. DDMG 2 3. LDMG 1 (NSW) 4. LDMG 2 (QLD) 5. LDMG 3 (QLD) 6. LDMG 4 (QLD)	• As per previous activation level, AND 1. D/S Residents 2. SDCC Watch Desk	• As per previous activation level	• As per previous activation level

Table 20: Earthquake—LEC & IC communication plan					
Activation level (QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert	**White Alert**	• Earthquake reported or felt in the area, AND • Intensity less than 5MM	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Earthquake damage)* What is the status? *(Under investigation)* Advise of current storage level Stand by for further information
Lean Forward	**White Alert**	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Earthquake damage)* What is the status? *(Under investigation)* Advise of current storage level Stand by for further information
Stand Up—1	**Amber**	• Earthquake reported or felt in the area, AND • A change detected from surveillance, OR • A possible failure path has been identified	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? (Dam Safety Risk—Earthquake felt or reported in area) What is the status? (Possible earthquake damage to dam) Advise of current storage level. Discuss any potential road/bridge closures Activate emergency response
			• 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 20: (continued) Earthquake—LEC & IC communication plan					
Activation level (QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Stand Up—2	**Red**	• Failure likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Earthquake damage)* What is the status? *(Dam Failure Likely)* Advise of current storage level. Discuss any potential road/bridge closures (if not discussed at Stand Up—1) Prepare coordinated evacuation
			• 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
		• Dam failure in progress	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Earthquake damage)* What is the status? *(Dam Failure In Progress)* Advise of current storage level Coordinate evacuation of 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
Stand Down	**All Clear**	• Risk assessment has determined that failure risk has reduced	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES • SDCC Watch Desk	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Earthquake damage)* What is the status? *(Dam Hazard Stood Down)* Advise risk assessment has been determined that failure risk has reduced and that EAP has been deactivated
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 21: Earthquake—DSTDM emergency action					
Activation level	**Alert**	**Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Down**
NSW Activation level	**White Alert**	**White Alert**	**Amber**	**Red**	**All Clear**
Activation trigger	• Earthquake reported or felt in the area, AND • Intensity less than 5MM	• Earthquake reported or felt in the area, AND • Intensity greater than or equal to 5MM, OR • Intensity less than 5MM and change detected during surveillance inspection	• Earthquake reported or felt in the area, AND • A possible failure path has been identified	• Failure in progress or likely due to earthquake, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has been determined that failure risk has reduced
Action	• Record all communication • Monitor situation and assess risks **NOTE:** 'Reported' is defined as an alert received from Geoscience Australia or other source that advises an earthquake >4.9ML (Richter Scale) has occurred within a 200km radius of the dam.	• As per previous activation level, AND • Review surveillance inspection of the dam and assess its condition as soon as possible • Determine if there are any possible failure paths from reported damage	• As per previous activation level, AND • Arrange an inspection of the dam and assess its condition as soon as possible, when safe to do so • Assess risk and determine if failure likely or in progress • Determine if remedial repairs are practical • Determine if risks can be reduced by lowering storage • Supervise* remedial repairs (if applicable)	• As per previous activation level	• Forward information for EER to IC email • Return to routine activities
Notifications	1. DDO 2. IC 3. DSR	• As per previous activation level	• As per previous activation level	• As per previous activation level	• As per previous activation level

* Supervision 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 Glenlyon Dam to a terrorist attack 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 indicate 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 an increased likelihood of a terrorist threat. If this were specific enough to name a dam, this circumstance would trigger Stand Up—1 activation level.

8.2 Emergency action roles

Table 22 to Table 26 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

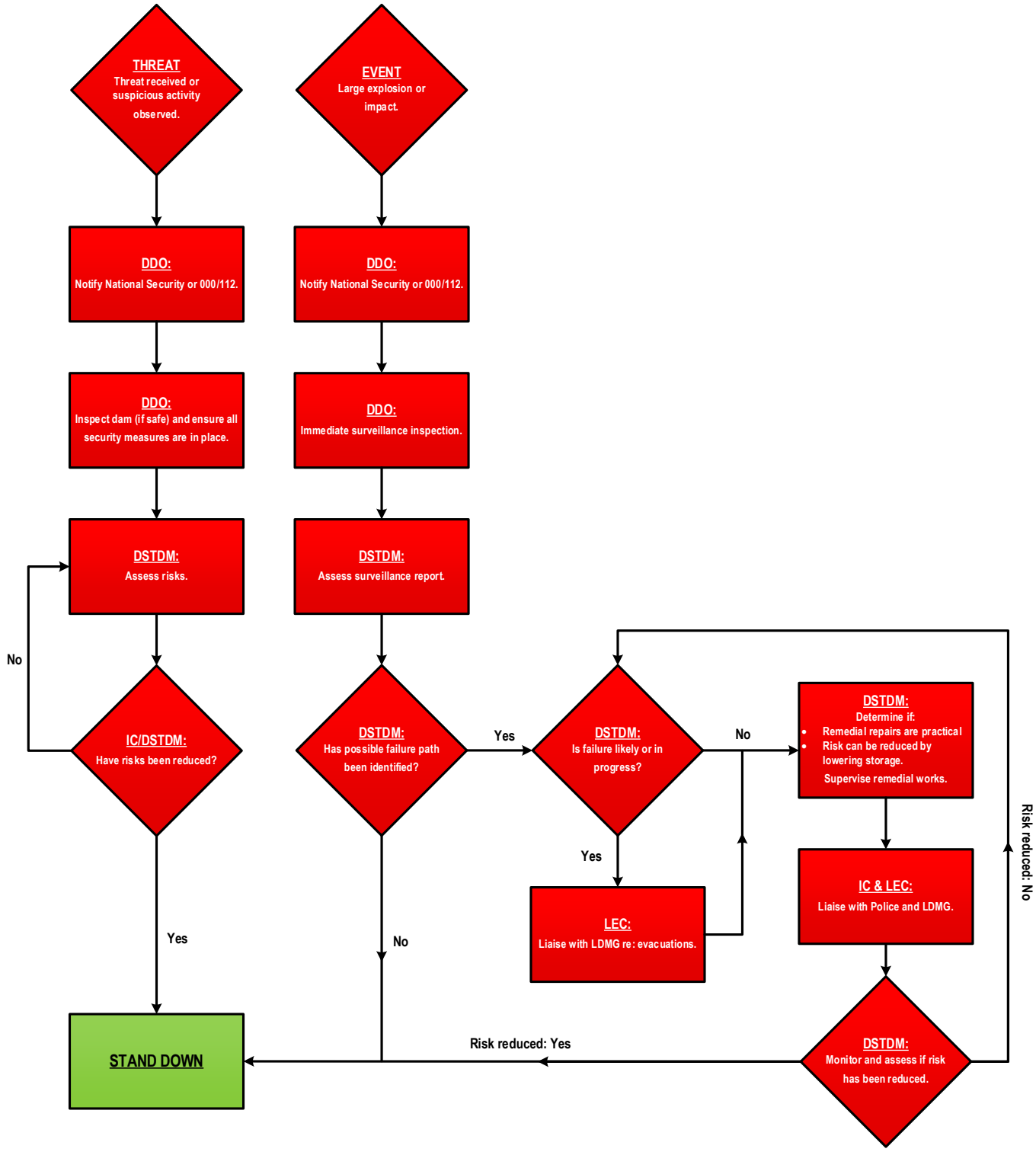


Table 22: Terrorist threat/activity or high energy impact—DDO emergency action					
QLD Activation level	**Alert/Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**Amber**	**Red**	**Red**	**All Clear**
Activation trigger	• Not applicable	**THREAT** • Possible terrorist activity/suspicious behaviour noticed at the dam, OR • Threat received	**EVENT** • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• **In an emergency call 000.** • Record all communication • If any suspicious behaviour noticed, contact DSTDM for advice. If instructed by DSTDM, of if threat received, complete the following: • Inspect dam (if safe) and ensure all security measures in place (locked gates, etc.) • Photograph/video suspicious items from a safe point and record using the approved forms and send to IC & DSTDM • If Police appoint Incident Manager, support and follow instructions • Close any affected roads as directed • Notify SO • Update Dam Logbook as per SOP 12 (ref K)	• As per previous activation level, AND • Vacate the immediate vicinity of the affected area	• As per previous activation level	• Forward information for EER to IC email • Update Dam Logbook as per SOP 12 (ref K) • Return to routine activities
Notifications	• Not applicable	1. **#000 Emergency** 2. DSTDM 3. IC 4. SO	• As per previous activation level	• As per previous activation level	• As per previous activation level

Table 23: Terrorist threat/activity or high energy impact—LEC emergency action					
QLD Activation level	**Alert/Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**Amber**	**Red**	**Red**	**All Clear**
Activation trigger	• Not applicable	**THREAT** • Possible terrorist activity/suspicious behaviour noticed at the dam, OR • Threat received	**EVENT** • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• If Police appoint incident manager support and follow instructions • Monitor situation and assess risks • Liaise with relevant council(s) regarding possible road/bridge closures	• As per previous activation level	• As per previous activation level, AND • Liaise with DDO, IC, and LDMG re: potential for evacuations	• Forward information for EER to IC email • Return to routine activities
Notifications	• Not applicable	1. DDO 2. IC 3. LDMG 1 4. LDMG 2 5. LDMG 3 6. LDMG 4	• As per previous activation level	• As per previous activation level	• As per previous activation level

Table 24: Terrorist threat/activity or high energy impact—IC emergency action					
QLD Activation level	**Alert/Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**Amber**	**Red**	**Red**	**All Clear**
Activation trigger	• Not applicable	**THREAT** • Possible terrorist activity/suspicious behaviour noticed at the dam, OR • Threat received	**EVENT** • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Actions	• Not applicable	• Record all communication • Contact National Security • If Police appoint Incident Manager, support and follow instructions • Create Incident Report Record • **Update Sunwater intranet with dam status**	• As per previous activation level • Consider the need to appoint a Sunwater Recovery Coordinator. The Sunwater Recovery Coordinator is responsible for the follow through on actions to close out all matters and works outstanding after the initial emergency is over. • Confirm EAs and other messages are prepared in advance – if required.	• As per previous activation level, AND • Liaise with DDO, DSTDM, and LEC re: potential for evacuations • Mobilise resources to undertake remedial works if directed by DSTDM	• Deactivate EAP event • Compile EER and deliver to DSR if required • Close Incident Report Record • **Update Sunwater intranet with dam status** • Return to routine activities
Notifications	• Not applicable	1. CTG 2. DDMG 1 3. DDMG 2 4. LDMG 1 (NSW) 5. LDMG 2 6. LDMG 3 7. LDMG 4 8. DDO 9. DSTDM 10. LEC/ORR 11. NSW SES 12. SMT 13. SRT	• As per previous activation level AND 1. D/S Residents 2. SDCC Watch Desk	• As per previous activation level	• As per previous activation level

Table 25: Terrorist threat/activity or high energy impact—LEC & IC communication plan					
Activation level-QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Alert	**White Alert**	**ALERT NOT APPLICABLE**			
Lean Forward	**White Alert**	**LEAN FORWARD NOT APPLICABLE**			
Stand Up—1	**Amber**	**THREAT** • Possible terrorist activity/suspicious behaviour notice at the dam, OR • Threat received	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES • CTG	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Security threat/ impact/explosion, etc.)* What is the status? *(Received/noted terrorist threat)* Discuss any potential road/bridge closures Activate emergency response
Stand Up—2	**Red**	**EVENT** • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES • CTG	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Security threat/ impact/explosion, etc.)* What is the status? *(Under Investigation)* Discuss any potential road/bridge closures (if not discussed at Stand Up—1) Prepare coordinated evacuation
			• 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	

Table 26 (continued): Terrorist threat/activity or high energy impact—LEC & IC communication plan					
Activation level-QLD/NSW		**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Stand Up—3	**Red**	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES	• Phone	Describe current situation with dam—What is the event? *(Dam Safety Risk—Security threat/impact/explosion, etc.)* What is the status? *(Dam Failure Likely/In Progress)* Initiate evacuations
			• 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.
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**
Stand Down	**All Clear**	• Risk assessment has determined that failure risk has reduced	• LDMG 1 (NSW) • LDMG 2 • LDMG 3 • LDMG 4 • DDMG 1 • DDMG 2 • NSW SES • SDCC Watch Desk	• Phone	Describe current situation with dam—What is the event? (Dam Safety Risk—Security threat/ impact/explosion, etc.) What is the status? (Dam Hazard Stood Down) Advise that failure risk has been reduced and EAP has been deactivated
			• D/S Residents	• SMS • (Phone for those without mobiles)	**Liaise with Sunwater customer support and communications to send appropriate messaging via SMS**

Table 26: Terrorist threat/activity or high energy impact—DSTDM emergency action					
QLD Activation level	**Alert/Lean Forward**	**Stand Up—1**	**Stand Up—2**	**Stand Up—3**	**Stand Down**
NSW Activation level	**White Alert**	**Amber**	**Red**	**Red**	**All Clear**
Activation trigger	• Not applicable	**THREAT** • Possible terrorist activity/suspicious behaviour noticed at the dam, OR • Threat received	**EVENT** • Large explosion heard/observed at dam (e.g., bomb explosion, aircraft hit)	**RESPONSE** • Failure in progress or likely due to impact or explosion, AND • Sufficient water in storage to create a dam hazard	• Risk assessment has determined that failure risk has reduced
Action	• Not applicable	• Record all communication • Assess risks	• As per previous activation level, AND • Arrange an inspection of the dam and assess its condition as soon as possible, when safe to do so • Assess risk and determine if failure likely or in progress • Determine if remedial repairs are practical • Determine if risks can be reduced by lowering storage • Supervise* remedial repairs (if applicable) • Monitor situation and assess risks	• As per previous activation level, AND • Liaise with the IC and advise on need to recommend evacuations	• Forward information for event report to IC • Return to routine activities
Notifications	• Not applicable	1. DDO 2. IC 3. SRT 4. DSR	• As per previous activation level	• As per previous activation level	• As required

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

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 27: Communications failure emergency activation trigger summary

Comms Failure – Site	• Unable to communicate to or from dam site (usually affects DDO)
Comms Failure – Local area	• Unable to communicate to or from local area (likely to affect LEC, OMGR or OS)
Comms Failure – Brisbane	• Unable to communicate to or from Sunwater Brisbane (could affect DSTDM or FODM & will affect IC)

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 daily 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 28 to Table 32 specify emergency actions for the following roles:

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

Table 28: Communications failure—DDO emergency action		
Activation level	**Comms Failure – Local Area**	**Comms Failure – Brisbane**
Activation trigger	• Unable to communicate to local area including LEC or ORR	• Unable to communicate to Sunwater Brisbane including IC or DSTDM or FODM
Actions	• Record all communication and attempts via Dam Logbook as per SOP 12 (ref K) and communications log if EAP event is current • As much as practicable, assume the role of LEC • Continue tasks in accordance with any other current emergency action • Every hour, attempt communications by any and all means noting the following: – Mobile phone - try texting instead of voice, much higher probability of success – Satellite phone - needs to access open sky unless external antenna fitted – Social media - e.g. Facebook (Internet may be available via landline)	• Record all communication and attempts via Dam Logbook as per SOP 12 (ref K) and communications log if EAP event is current determine if LEC is in communication and if not, assume the LEC role as much as is practicable • Continue tasks in accordance with any other current emergency action • Every hour, attempt communications by any and all means noting the following: – Mobile phone— try texting instead of voice, much higher probability of success – Satellite phone – needs to access open sky unless external antenna fitted – Social media – e.g. Facebook (Internet may be available via landline)
Notifications	1. IC 2. SO (if available)	1. LEC 2. SO (if available)

Table 29: Communications failure—LEC emergency action		
Activation level	**Comms Failure – Dam Site**	**Comms Failure – Brisbane**
Activation trigger	• Unable to communicate to dam site	• Unable to communicate to Sunwater Brisbane including IC or DSTDM or FODM
Actions	• Record all communication and attempts • Every hour, attempt communications by any and all means noting the following: – Mobile phone,-,try texting instead of voice, much higher probability of success – Satellite phone - needs to access open sky unless external antenna fitted – Social media,-,e.g. Facebook (Internet may be available via landline) • Assume that the DDO is carrying out LEC role at site as much as practicable • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action	• Record all communication and attempts • Issue Sunwater Incident Alert – Every hour, attempt communications by any and all means noting the following: – Mobile phone - try texting instead of voice, much higher probability of success – Satellite phone - needs to access open sky unless external antenna fitted – Social media - e.g. Facebook (Internet may be available via landline) • Liaise with the DDO and assume IC role • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action
Notifications	1. IC 2. DSTDM 3. SO (if available) 4. LDMG 1 5. LDMG 2 6. LDMG 3 7. LDMG 4	1. DDO 2. DSTDM (if available) 3. SO 4. LDMG 1 5. LDMG 2 6. LDMG 3 7. LDMG 4 8. DDMG 1 9. DDMG 2

Table 30: Communications failure—LEC and IC communication plan				
Activation level	**Trigger for communications**	**Group to contact**	**Method**	**Message text**
Comms Failure – Site	• Unable to communicate to or from dam site, AND • DDO is at dam site	• IC/LEC • DSTDM • SO (if available) • LDMG 1 (if available) • LDMG 2 (if available) • LDMG 3 (if available) • LDMG 4 (if available) • DDMG 1 (if available) • DDMG 2 (if available)	• Phone	Describe current situation with dam communications. What is the status – estimated time to restore communications?
Comms Failure – Local Area	• Unable to communicate to or from local area including LEC and ORR	• DDO (if available) • DSTDM • SO (if available) • LDMG 1 (if available) • LDMG 2 (if available • LDMG 3 (if available • LDMG 4 (if available • DDMG 1 (if available) • DDMG 2 (if available)	• Phone	Describe current situation with dam communications. What is the status – estimated time to restore communications?
Comms Failure – Brisbane	• Unable to communicate to or from Sunwater Brisbane	• DSTDM (if available) • LDMG 1 (if available • LDMG 2 (if available • LDMG 3 (if available • LDMG 4 (if available • DDMG 1 (if available) • DDMG 2 (if available)	• Phone	Describe current situation with dam communications. What is the status – estimated time to restore communications?

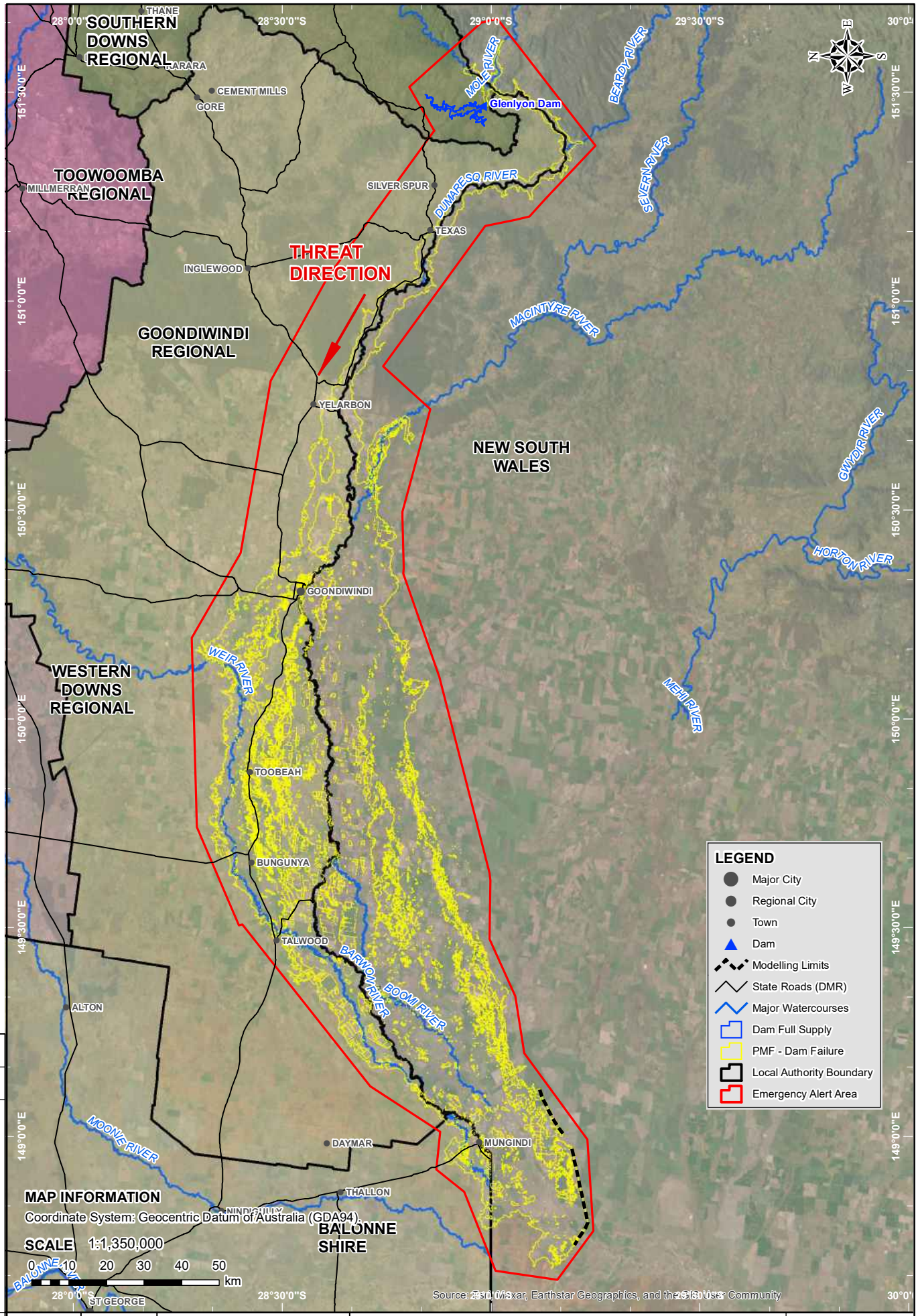
Table 31: Communications failure—DSTDM emergency action		
Activation level	**Comms Failure – Dam Site**	**Comms Failure – Local Area**
Activation trigger	• Unable to communicate to dam site	• Unable to communicate to local area including LEC and ORR
Actions	• Record all communication • Provide technical advice to IC/LEC on a needs basis • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action	• Record all communication • Provide technical advice to IC on a needs basis • Assume that the DDO is assisting IC with LEC role • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action
Notifications	• IC • LEC • CEO (if time permits) • DSR (if applicable)	• IC • DDO (if available) • And CEO (if time permits) • DSR (if applicable)

Table 32: Communications failure—FODM emergency action		
Activation level	**Comms Failure – Site**	**Comms Failure – Local Area**
Activation trigger	• Unable to communicate to dam site	• Unable to communicate to local area including LEC and ORR
Actions	• Record all communication • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action	• Record all communication • Assume that the DDO is assisting IC with LEC role • As much as is practicable, continue other tasks associated with the role in accordance with any other current emergency action
Notifications	1. ICLEC 3. DSTDM	1. IC 2. DDO (if available) 3. DSTDM

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 D/S Residents (outside area – requested messaging)
A6 Other reference contacts
A7 Emergency alert polygon
A8 Dam failure emergency alert request

Appendix A1 to Appendix A6 have been redacted



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Printed: Thursday, 10/08/2023 11:48:01 AM

MAP PRODUCED BY:
WATER RESOURCES & DAM SAFETY
TEL: (07)3120 0000

REVISION	DATE	REMARKS		
C	09/08/23	ALERT AREA AMENDED	LH	MH
B	04/10/18	ALERT AREA AMENDED	CD	MH
			CKD	PSD

DRAWN IDH | DESIGNED
CHECKED MB | CHECKED
APPROVED M. HUGHES 23/1/2018

sunwater

GLENLYON DAM
EMERGENCY ACTION PLAN
EMERGENCY ALERT AREA

CONTRACT NUMBER
DRAWING NUMBER 249577
REV. C
SHEET 1 OF 1
DATE JANUARY 2018

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 Glenlyon Dam 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 [redacted] and tell them your intention to use the Emergency Alert for an emergency event for Glenlyon Dam.
- 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 Sunwater: People downstream of Glen lion Dam including the doo mar resk Valley and Bon shaw must LEAVE IMMEDIATELY. Glen lion Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Tenter field and More ee are safe. More information here: Southern Downs Regional Council disaster dot es dee are see dot que el dee dot guv dot ay you and gun dah windy Regional Council dashboard dot gee are see dot que el dee dot guv dot ay you	FLOOD EMERGENCY WARNING from Sunwater: People downstream of Glenlyon Dam including the Dumaresq Valley and Bonshaw must LEAVE IMMEDIATELY. Glenlyon Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Tenterfield and Moree are safe. More information here: Southern Downs Regional Council http://disaster.sdrc.qld.gov.au and Goondiwindi Regional Council http://dashboard.grc.qld.gov.au/

The Glenlyon Dam Emergency Alert request form is presented on the next two pages.

Queensland Government

PHONE THE [redacted] – ADVISE EA IS BEING DEVELOPED

EMERGENCY ALERT REQUEST

Location of Alert: Glenlyon Dam	**Date:**
LGA/Agency requesting: Sunwater	**Time:**

Requesting Officer:
Name:
Agency/Position:

Telephone:
(SDCC Watch Desk may telephone you)

Email:

Advised N/A **LDC/LDMG**: ☒ YES **DDC/DDMG**: ☒ YES **Neighbouring LDMG/LGA & STATE**: ☒ YES ☐

Send Alert

Immediately: ☒ YES **Scheduled**: ☐ YES Date & Time / / : hrs

Event Type

☐ Cyclone ☐ Storm Tide ☐ Flash Flood ☐ Flood
☐ Bushfire ☐ Fire Incident ☐ Smoke / Toxic Plume ☐ Chemical Spill
☐ Tsunami (Sent as Location Based Text Message ONLY)
☒ Other (please specify): Catastrophic Dam Failure

Distributed by: (Channel)

☒ Voice (Landline only) ☒ SMS – Location Based (Location of phone at time of distribution) ☐ SMS – Service Address Based (Registered billing address)

Message Severity

☒ Emergency Warning (Activates SEWS) ☐ Watch & Act ☐ Advice

Threat Direction Required? (e.g. Fire, Chemical Spill, Dam Spill) ☐ YES ☒ N/A

Threat location indicated on map? Only For Emergency Warning Voice & Service Address SMS ☐ YES ☒ N/A

EA Messaging Filename (Doc, Pdf):

Polygon Filename, (Kml, Kmz, Gml, GeoJSON): Glenlyon Dam

Number of polygons 1 (if multiple, attach list in order of priority)

Supplied via: ☒ DM Portal ☐ Email ☐ Verbal ☐ Other
Other (please specify):

Supplied via: ☒ DM Portal ☐ Email ☐ Verbal ☐ Other
Other (please specify):

Voice: Type or handwrite, max 4000 characters incls spaces. (Ideally message should be < 450 characters)

FLOOD EMERGENCY WARNING from Sunwater: People downstream of Glen lion Dam including the doo mar resk Valley and Bon shaw must LEAVE IMMEDIATELY. Glen lion Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Tenter field and More ee are safe. Get full warnings and what you should do at Southern Downs Regional Council disaster dot es dee are see dot que el dee dot guv dot ay you and gun dah windy Regional Council dashboard dot gee are see dot que el dee dot guv dot ay you

SMS: Type or handwrite, use capitals for clarity, max 612 characters incls spaces. (Ideally should be < 160 characters incl. spaces)

FLOOD EMERGENCY WARNING from Sunwater: People downstream of Glenlyon Dam including the Dumaresq Valley and Bonshaw must LEAVE IMMEDIATELY. Glenlyon Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Tenterfield and Moree are safe. Get full warnings and what you should do at Southern Downs Regional Council disaster.sdrc.qld.gov.au and Goondiwindi Regional Council dashboard.grc.qld.gov.au/

Remove EA from websites:

☐ 12 hrs ☐ 24 hrs ☐ 48 hrs ☐ Specify Date & Time: ☒ Check back in 12 hrs:
☐ Replace previous EA message / / : hrs Contact #:_____

Requesting Officer: **Signature:** **Date:** / /

Send to [redacted] to confirm receipt

FOR USE BY SDCC

EA Request Form completed by: SDCC Watch Desk ☐ Requesting Officer ☐

Notification of any delays provided to Requestor: ☐ YES ☐ NO

EA User Name:
Signature: Date: / /

Emergency Alert No:

Authorising Officer Name:
Signature: Date: / /

EMS EA Campaign Report ID:

Report provided to Requestor on EA outcomes: ☐ YES ☐ NO

The EA Manual, EA Quick Reference Guide, EA Request Form Template are available at: www.disaster.qld.gov.au

DO NOT SEND THIS PAGE	
GUIDE TO COMPLETE STEPS 1 – 4	
STEP 1.	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.
STEP 2.	Tick applicable box and note the file name.
STEP 3.	Voice Message: type or handwritten the required message. 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. Voice Message ideally should have no more than 450 characters including spaces. Do not use special characters – refer to EA Manual for details. Warning message must start with "Emergency Emergency"
STEP 4.	SMS Is restricted to a maximum of 160 characters including spaces and punctuation. Either type the message or handwrite the characters into the boxes.

Example: *SMS Flash Flood Warning from SES for Opal Valley-immediate threat to life/property-Warn others-Leave area/prepare NOW or seek higher ground-Listen to local radio*

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

//RELEVANTAUTHORITY//

//DIRECTIONANDAREA//

//NAME//

//NUMBER//

//TIME//

//TIMEandDAY//

//DIRECTIONandPLACE//

//HOURSMINUTES//

//PLACE//

//PLACEPLACE//

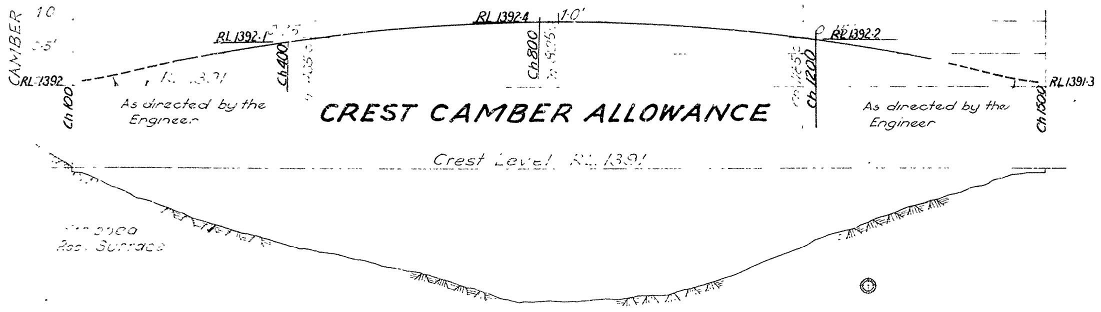
//EXTERNAL/INTERNAL//

//SUBURBS//

//FireIncident//

APPENDIX B Drawings, maps, and emergency control measures

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.

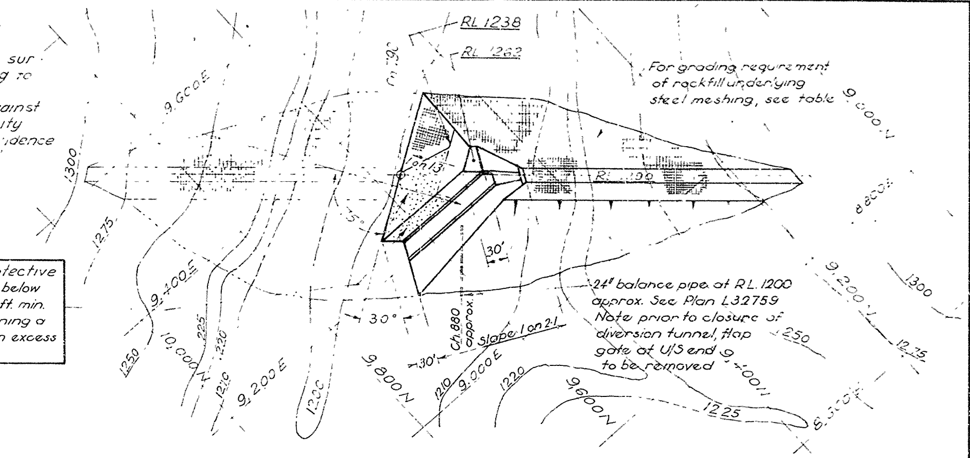


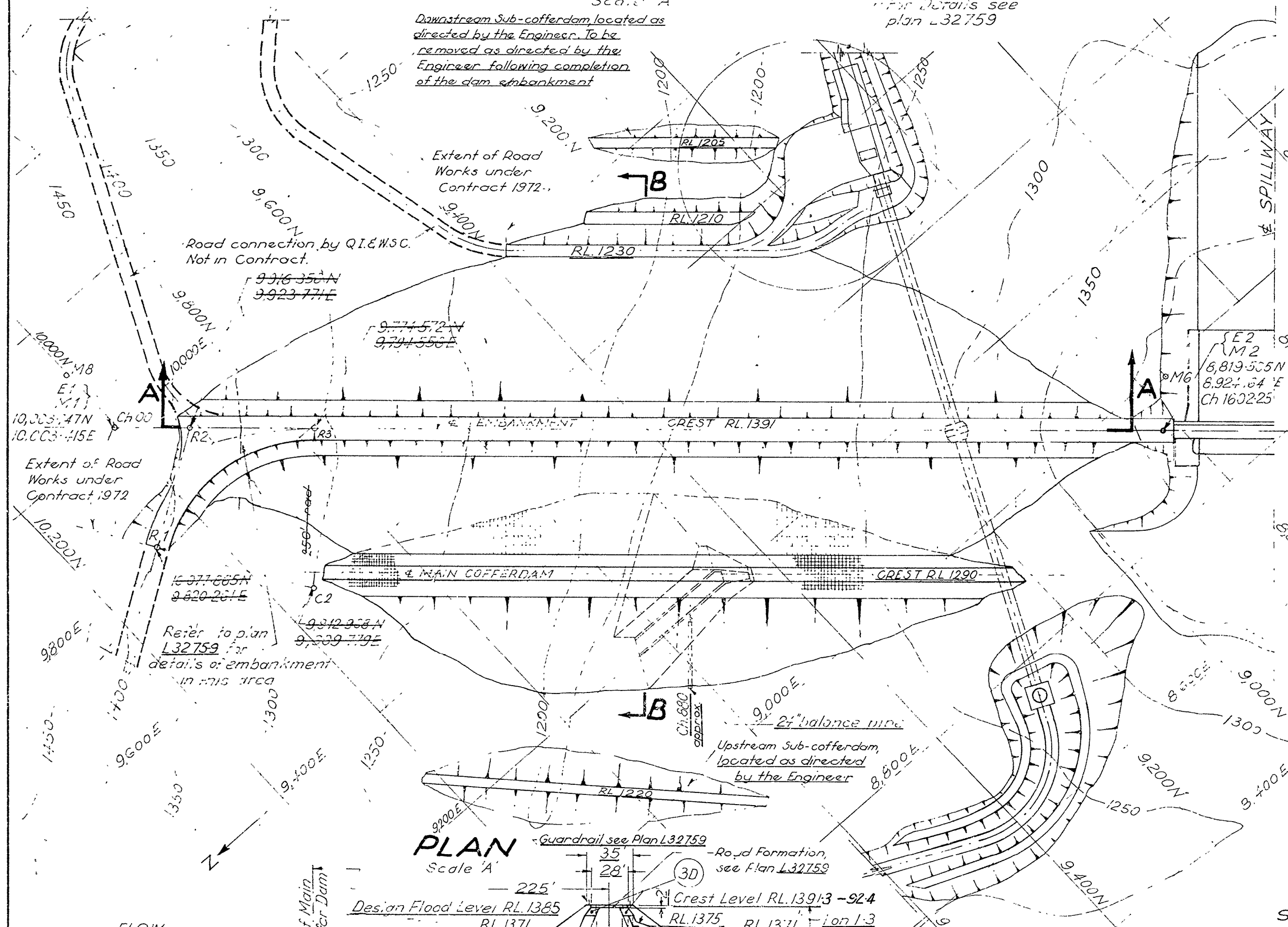
SECTION A-A

Scale 'A'

During and following construction of the right abutment section of the main cofferdam the core junction surface shall receive periodic spraying to minimise drying out.
Prior to placement of material against the junction surface all low density material and material showing evidence of segregation shall be removed from both core and filter areas and wasted.

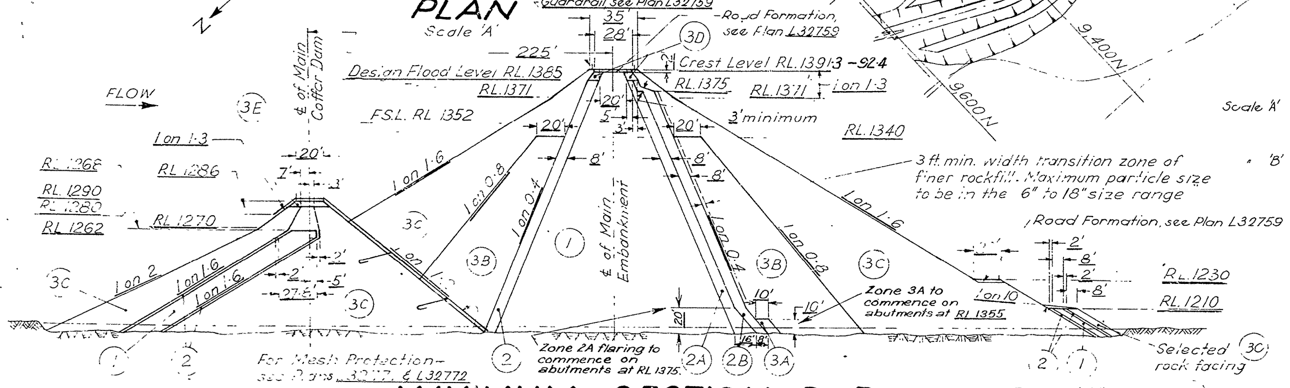
Large size rockfill protective facing of flow past face below RL 1238. Facing to be 20ft. min. thickness of rockfill containing a minimum of 80% particles in excess of 5,000 lb in weight





PLAN

Scale 'A'



MAXIMUM SECTION B-B

Scale 'B'

SCALES

Scale 'A' 100 0 100 200 Feet

'B' 50 0 50 100 "

MAIN COFFERDAM
DETAIL OF CONSTRUCTION JOINT REQUIREMENT

Scale 'A'

ZONE	DESCRIPTION OF ZONE	MATERIAL SPECIFICATION	PLACEMENT SPECIFICATION
4	U/S & D/S Sub-cofferdams	Selected waste material from Disposal Areas as directed by the Engineer. (13,000 cu.yds.)	Compacted in 12" layers by 2 passes of an 8·5 ton vibratory roller.
MAIN COFFERDAM AND MAIN EMBANKMENT			
1	Core	Impervious material - grading limits as specified on plan L32759. (503,000 cu.yds.)	Compacted in 6" layers by tamping roller to a minimum of 98% Proctor max. density. Moisture limits O.M.C. ± 1%
2A	Fine Filter downstream	Sand - grading limits as specified on plan L32759. (50,000 cu.yds.)	Compacted in 15" to 18" lifts by one pass (min.) of an 8·5 ton vibratory roller
2B	Coarse Filter downstream	Gravel - grading limits as specified on plan L32759. (46,000 cu.yds.)	Compacted in 15" to 18" lifts by one pass (min) of an 8·5 ton vibratory roller
2	Upstream filter & Cofferdam filter	Graded Gravel - grading limits as specified on plan L32759 (70,000 cu.yds.)	Compacted in 15" to 18" lifts by one pass (min) of an 8·5 ton vibratory roller
3A	Transition Zone	Graded rockfill - grading limits as specified on plan L32759. (5,000 cu.yds.)	Compacted in 15" to 18" lifts by one pass of an 8·5 ton vibratory roller
3B	Compacted Rockfill	Sound Rockfill (316,000 cu.yds.)	Compacted in 3ft. lifts by 4 passes of an 8·5 ton vibratory roller. Zone (3B) watered at the rate of 50 gallons per cubic yard downstream of Main Embankment ℄.
3C	"	Sound Rockfill. Rockfill underlying and within 10 ft. of protective steel meshing in the main cofferdam shall consist of sound particles, and shall be well graded containing 90% of particles in excess of 4" size. See also requirements for rockfill in flow past face of Main Cofferdam Construction Joint. (870,000 cu.yds.)	Compacted in 6 ft. lifts by 2 passes of an 8·5 ton vibratory roller. Zone (3C) watered at a rate of 50 gallons per cubic yard downstream of Main Embankment ℄.
3D	"	Fine Rockfill (2,500 cu.yds.)	Compacted in 15" to 18" lifts by one pass of an 8·5 ton vibratory roller.
3E	"	Rockfill - 95% of material + 4" size. (4,000 cu.yds.)	Compacted in 2 ft. lifts by one pass of an 8·5 ton vibratory roller. Upper layer dumped and spread by crawler tractor only.

REFERENCE PLANS

General Arrangement ---------- L32754
Embankment Instrumentation ---------- L32755
Setting Out Control ---------- L32742
Main Embankment-Details ---------- L32759
Main Cofferdam - Mesh Protection, Sheets 1 and 2 ---------- L32771/2
Abutment & Spillway Grouting ---------- L32770

WORKS CARRIED OUT BY Q.I.& W.S.C.

Main Embankment - Foundation Stripping (For information only) ---------- L32793
Main Embankment - Grouting (For information only) ---------- L32794
Main Embankment - Foundation Special Dental Concreting (For information only) ---------- L34185

NOTES

1 The quantities shown assume 5 ft. depth of stripping below natural surface.
2 The datum of levels and the basis of the co-ordinate system are defined on Plan L32742.
3 Levels shown do not include the crest camber allowance. The raised crest including camber is to be effected by commencing the 1 on 1·3 slope below RL 1371 as necessary to obtain the adjusted crest levels
4 This plan is to be read in conjunction with Plan L32759 - "Main Embankment, Details"

AS BUILT
By PM
Class'n P/E
Date 2? JUL 1975

QUEENSLAND IRRIGATION AND WATER SUPPLY COMMISSION
ASSISTANT COMMISSIONER ENG.
CHIEF CONSTRUCTION ENGINEER

NEW SOUTH WALES
WATER CONSERVATION AND IRRIGATION COMMISSION

PIKE CREEK DAM
MAIN EMBANKMENT
ARRANGEMENT

B	13-4-77	As Built	
B.W.		Reference plans for information only amend. Filter flarings amended on Section B-B	6-3-74

REVISION

[signature] 29-3-73. CHIEF ENGINEER - DESIGN & CONSTRUCTION
R. H. Foster 29.3.73 PRINCIPAL DESIGN ENGINEER

Drawn HH DEC 72
Checked
Examined MAR 73
Passed

CONTRACT No 1972

L 32750
A B

Traced | Calc File | Papers

INS. 0 2 4 6 8
CM. 0 2 4 6 8 10 20 30

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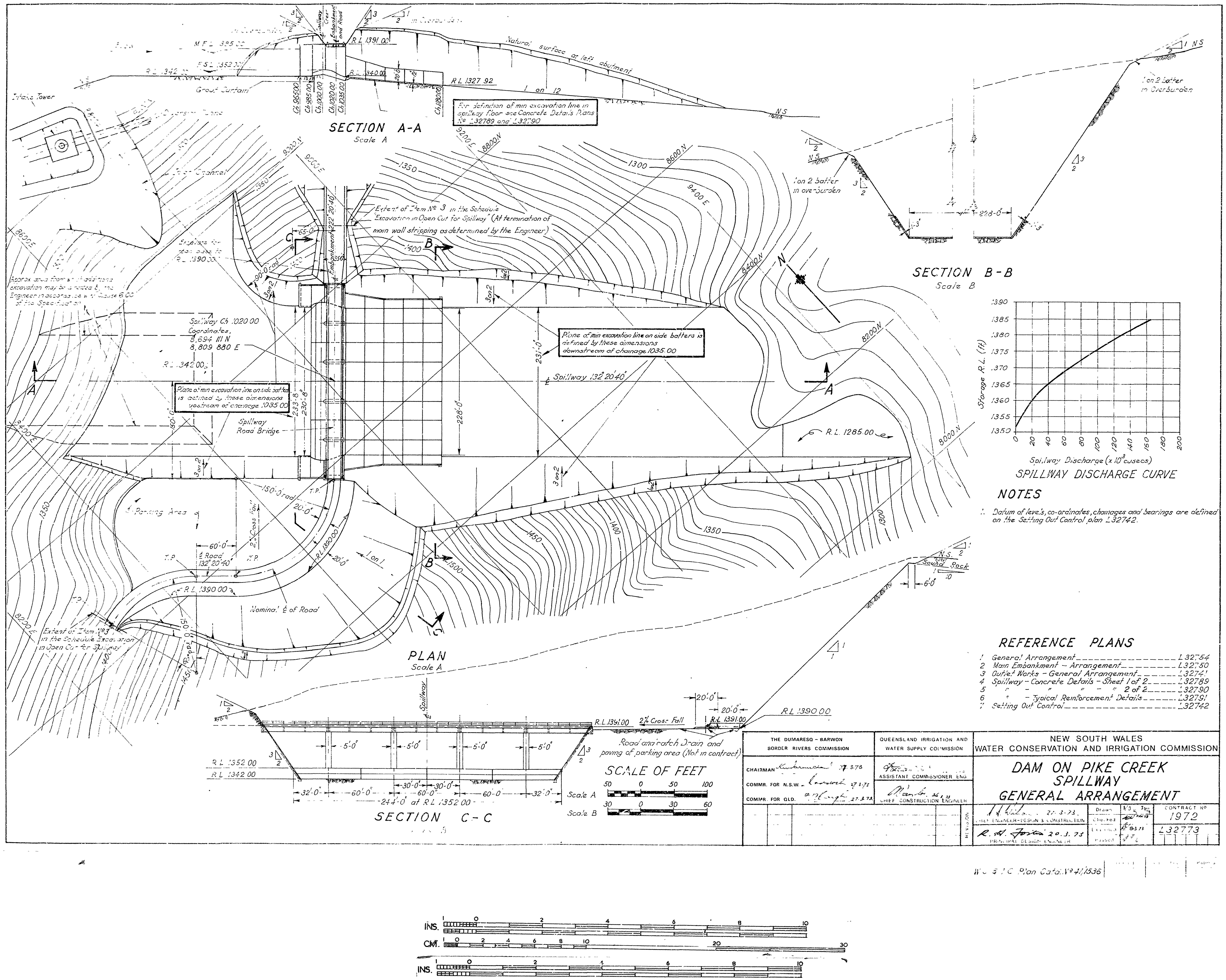
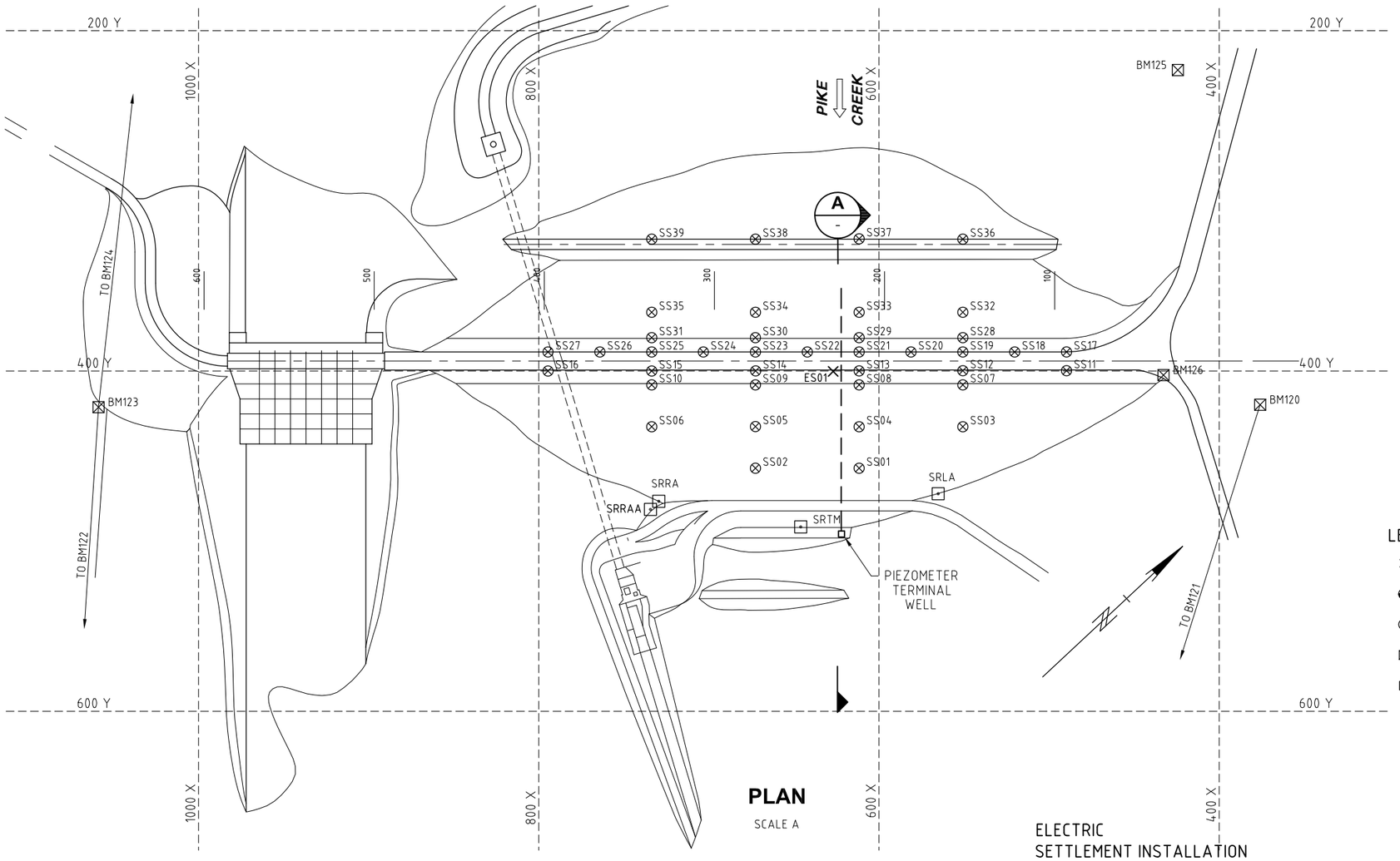
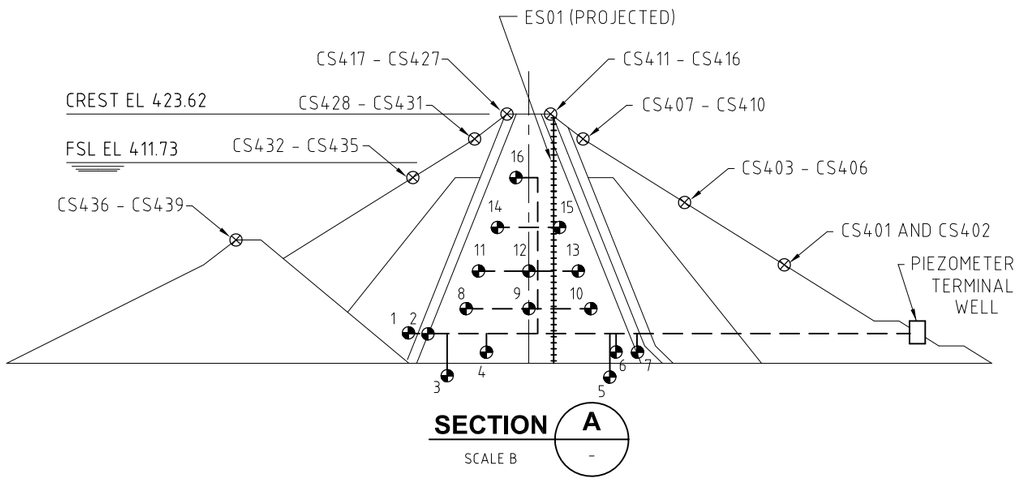

SECTION A-A
Scale A
Natural surface at left abutment
Intake Tower
Grout Curtain
R.L. 1391.00
R.L. 1327.92
1 on 12
For definition of min excavation line in spillway floor see Concrete Details Plans Nº L32789 and L32790
SECTION B-B
Scale B
1 on 2 batter in overburden
PLAN
Scale A
Extent of Item Nº 3 in the Schedule Excavation in Open Cut for Spillway (At termination of main wall stripping as determined by the Engineer)
Spillway Ch. 1020.00
Coordinates
8,694 111 N
8,809 880 E
Plane of min excavation line on side batters is defined by these dimensions downstream of chainage 1035.00
℄ Spillway 132° 20' 40"
Spillway Road Bridge
Parking Area
Nominal ℄ of Road
R.L. 1390.00
R.L. 1285.00
Extent of Item Nº 3 in the Schedule Excavation in Open Cut for Spillway
Storage R.L. (ft)
Spillway Discharge (x 10³ cusecs)
SPILLWAY DISCHARGE CURVE
NOTES
1. Datum of levels, co-ordinates, chainages and bearings are defined on the Setting Out Control plan L32742.
REFERENCE PLANS
1 General Arrangement — L32754
2 Main Embankment – Arrangement — L32750
3 Outlet Works – General Arrangement — L32741
4 Spillway – Concrete Details – Sheet 1 of 2 — L32789
5 " " " 2 of 2 — L32790
6 " – Typical Reinforcement Details — L32791
7 Setting Out Control — L32742
SECTION C-C
R.L. 1352.00
R.L. 1342.00
244'-0" at R.L. 1352.00
Road and catch Drain and paving of parking area (Not in contract)
2% Cross Fall
SCALE OF FEET
Scale A
Scale B
THE DUMARESQ - BARWON BORDER RIVERS COMMISSION
QUEENSLAND IRRIGATION AND WATER SUPPLY COMMISSION
NEW SOUTH WALES WATER CONSERVATION AND IRRIGATION COMMISSION
CHAIRMAN
COMMR. FOR N.S.W.
COMMR. FOR QLD.
ASSISTANT COMMISSIONER ENG.
CHIEF CONSTRUCTION ENGINEER
DAM ON PIKE CREEK
SPILLWAY
GENERAL ARRANGEMENT
CONTRACT Nº 1972
L32773
W.C. & I.C. Plan Catal. Nº 41/1536

DWG 32773.TIF



PLAN

SCALE A



SECTION A

SCALE B

LEGEND:

- × ELECTRIC SETTLEMENT POINT
- ◓ HYDRAULIC PIEZOMETER
- ⊗ SURFACE MOVEMENT STATION
- ⊠ SURVEY CONTROL STATION
- ⊡ SEEPAGE MEASUREMENT WELL

SURFACE MOVEMENT STATIONS

(ORIGINAL COLLIMATION STATIONS)

No.	X	Y	ORIGINAL ELEVATION
SS1	611.6840	457.4292	386.5890
SS2	672.6543	457.4921	386.5300
SS3	550.3166	432.8938	401.8843
SS4	612.0143	432.9867	401.7946
SS5	672.8213	433.0396	401.7687
SS6	733.8997	432.9551	401.8644
SS7	550.8748	408.0572	417.5681
SS8	611.8421	407.9803	417.7551
SS9	672.6259	407.9679	417.6032
SS10	733.5635	408.0584	417.5087
SS11	489.7864	399.6515	423.8640
SS12	550.7598	399.6230	423.9840
SS13	611.7253	399.6479	423.9850
SS14	672.5433	399.6048	424.0230
SS15	733.4630	399.6366	424.0460
SS16	794.5085	399.6649	424.0070
SS17	489.7039	389.0038	423.8410
SS18	520.2075	388.9745	423.9810
SS19	550.4622	388.9986	423.9400
SS20	580.5807	388.9703	423.8360
SS21	611.7165	388.9981	423.8860
SS22	641.4890	388.9287	423.8080
SS23	672.6900	388.9646	423.8380
SS24	703.0890	388.9876	423.8480
SS25	733.5863	388.9633	424.0020
SS26	763.9639	388.9886	423.9170
SS27	794.5269	389.0084	423.8520
SS28	550.7862	380.5845	417.6090
SS29	611.9190	380.5255	417.3225
SS30	672.6627	380.5469	417.1321
SS31	733.5886	380.5889	417.1828
SS32	550.8279	365.5627	408.3191
SS33	611.7014	365.4881	407.8469
SS34	672.0558	365.4198	407.6136
SS35	733.5678	365.4820	407.4443

SEEPAGE MEASUREMENT WELLS

No	LOCATION
SRLA	TOE OF LEFT ABUTMENT
SRRA	TOE OF RIGHT ABUTMENT
SRTM	TOE OF EMBANKMENT
SRRAA	GROIN SEEPAGE

ELECTRIC SETTLEMENT INSTALLATION

No	X	Y	ORIGINAL ELEVATION	No. OF X-ARMS
ES01	626.900	400.200	423.584	37

HYDRAULIC PIEZOMETER INSTALLATIONS

	TIP No	AXIS DISTANCE	AXIS OFFSET	ELEVATION
	HP01	225.27	29.36 U/S	370.08
	HP02	225.44	24.50 U/S	370.07
*	HP03	225.55	19.81 U/S	359.69
	HP04	"	10.36 U/S	365.40
	HP05	"	19.81 D/S	359.30
	HP06	"	21.34 D/S	365.40
	HP07	"	26.52 D/S	365.40
	HP08	"	15.24 U/S	376.00
	HP09	"	0.00	376.03
	HP10	"	15.24 D/S	376.04
	HP11	"	12.19 U/S	385.02
	HP12	"	0.00	384.81
	HP13	"	12.19 D/S	385.03
	HP14	"	7.62 U/S	395.79
	HP15	"	7.62 D/S	395.75
*	HP16	"	3.05 U/S	407.68

GAUGE DATUM = EL 370.64

SURVEY CONTROL STATIONS

SURVEY No.	X	Y	ELEVATION	REMARKS
BM120	375.9220	419.8500	455.8111	PILLAR (ORIG M8)
BM121	557.5403	998.0893	429.7883	PILLAR (ORIG M9)
BM122	1098.2410	1033.6280	389.0110	PILLAR (ORIG M10)
BM123	1058.7849	421.2612	470.7108	PILLAR
BM124	1026.9874	133.6932	415.8172	PILLAR
BM125	424.3141	223.0923	422.1660	PILLAR
BM126	432.7553	402.3910	425.4110	PILLAR

NOTES:

1. CO-ORDINATE DATUM: ARBITRARY GRID ('X' ALIGNED WITH DAM AXIS)
2. LEVELS DATUM = AHD (FOR STATE DATUM ADD 0.36m)
3. ALL INSTRUMENT LOCATIONS COMPILED FROM 'AS BUILT' DATA
4. TOP OF PILLAR AND SETTLEMENT MARKS ARE 0.055m LOWER THAN LEVELS SHOWN IN TABLES
5. NEW PILLARS INSTALLED AND COORDINATE SYSTEM ADOPTED NOV 2004

S:\BW Asset Delivery\Exf-BorderRivers\Glenlyon Dam Instrumentation\Drawings\AutoCAD\224201-B.dwg
07 Dec 2015 8:39 AM

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

REVISION					
04/12/15	B	SRRAA LOCATION ADDED	AN	M. COSTA	
10/04/13	A	CONVERSION TO AHD	WH	AMB	
DATE		REMARKS	CKD	PASSED	

REFERENCE DRAWINGS	
FB20727	H.O FIELD BOOK
M33295	SEEPAGE - ADDITIONAL INFO
L32756	SEEPAGE MEASUREMENT LAYOUT
L32742	SURVEY CONTROL PLAN
A1-49539	DEFORMATION SURVEY - KEY PLAN
L32755	EMBANKMENT INSTRUMENTATION

SCALES (A3 SIZE)

A 0 50 100 150 METRES 1:3000

B 0 25 50 75 METRES 1:1500

DRAWN	DESIGNED
RET	
CHECKED	CHECKED
APPROVED	
D.HOUSTON	
CHIEF SURVEYOR	

DAM SAFETY INVESTIGATIONS GLENLYON DAM INSTRUMENTATION LAYOUT

CONTRACT NUMBER

DRAWING NUMBER 224201

REV. B

SHEET

DATE APRIL 2005

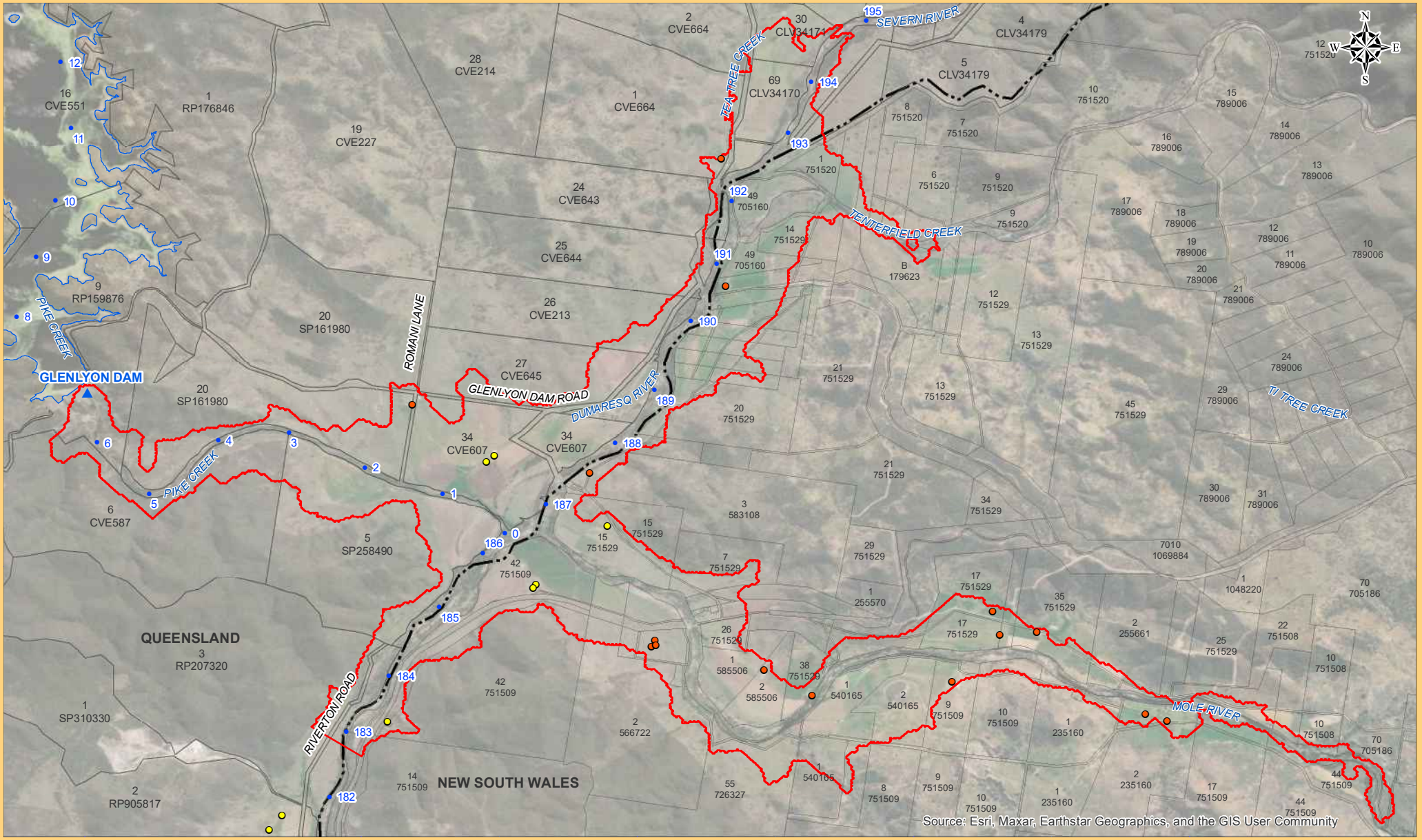
Appendix B2: Flooding impact—downstream

Table B1: Glenlyon Dam flood impact downstream (2017 FIA)

Population at Risk	SDF	DCFNF	DCFF	3e5NF	3e5F	6e5NF	6e5F	PMPDFNF	PMPDFF	PMFNF	PMFF
Total	650	2,179	3,114	2,260	3,164	2,491	3,285	2,569	3,332	2,807	3,477
Incremental		935		903		794		762		670	

Flood Impact Mapping

The map on the next page indicates the downstream notification area for outflows from Glenlyon dam.



MAP INFORMATION

Coordinate System: Geocentric Datum of Australia (GDA94).

SCALE (A4 SIZE)

0 700 1,400 2,100 2,800 3,500 m 1:70,000

LEGEND

- PAR - No Dam Failure
- PAR - Dam Failure
- AMTD (Markers)
- Dam Full Supply Level
- Limit of Downstream Notification Area

GLENLYON DAM 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).

sunwater

DRAWING No. 250713 C

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Appendix B3: Inundation maps

Drawings:

- Key map (also acts as locality plan)
- sunny day failure (SDF), main embankment
- probable maximum flood (PMF), main embankment

Note: These plans were produced using the information from the 2017 Failure Impact Assessment. Considering the broader downstream impact zone and the inclusion of more at-risk population in the 2017 Failure Impact Assessment, the maps from the 2017 assessment have been incorporated into this Emergency Action Plan. These maps offer a more comprehensive overview of potential floodplain impacts and hold greater utility within an emergency management context.

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.

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250024-C.mxd
Printed: Friday, 28/10/2022 07:09:49 AM

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

148°30'0"E 149°0'0"E 149°30'0"E 150°0'0"E 150°30'0"E 151°0'0"E 151°30'0"E
28°0'0"S 28°30'0"S 29°0'0"S 29°30'0"S

QUEENSLAND
NEW SOUTH WALES

E J BEARDMORE DAM
ST GEORGE
MUNGINDI
Mungindi Weir
GOONDIWINDI
Goondiwindi Weir
Boggabilla Weir
Coomonga Creek Weir
Boomi Diversion Weir
COOLMUNDA DAM
Whetstone Weir
Greenup Weir
Ben Dor Weir
Glenarbon Weir
Cunningham Weir
TEXAS
Bonshaw Weir
GLENLYON DAM
MOREE
INVERELL
GLEN INNES
PITTSWORTH

SHEET 28 OF 37
SHEET 23 OF 37
SHEET 19 OF 37
SHEET 15 OF 37
SHEET 22 OF 37
SHEET 18 OF 37
SHEET 32 OF 37
SHEET 27 OF 37
SHEET 14 OF 37
SHEET 11 OF 37
SHEET 31 OF 37
SHEET 26 OF 37
SHEET 21 OF 37
SHEET 17 OF 37
SHEET 13 OF 37
SHEET 9 OF 37
SHEET 10 OF 37
SHEET 7 OF 37
SHEET 8 OF 37
SHEET 6 OF 37
SHEET 35 OF 37
SHEET 30 OF 37
SHEET 25 OF 37
SHEET 20 OF 37
SHEET 16 OF 37
SHEET 12 OF 37
SHEET 5 OF 37
SHEET 37 OF 37
SHEET 34 OF 37
SHEET 29 OF 37
SHEET 24 OF 37
SHEET 4 OF 37
SHEET 1 OF 37
SHEET 36 OF 37
SHEET 33 OF 37
SHEET 3 OF 37
SHEET 2 OF 37

WESTERN DOWNS REGIONAL COUNCIL
BALONNE SHIRE COUNCIL
GOONDIWINDI REGIONAL COUNCIL
TOOWOOMBA REGIONAL COUNCIL
SOUTHERN DOWNS REGIONAL COUNCIL
MOREE PLAINS SHIRE COUNCIL
GWYDIR SHIRE COUNCIL
INVERELL SHIRE COUNCIL
TENTERFIELD SHIRE COUNCIL
GLEN INNES SEVERN SHIRE COUNCIL
NARRABRI SHIRE COUNCIL

BALONNE RIVER
BIDGEL CREEK
TEELBA CREEK
MOONIE RIVER
MOONIE HIGHWAY
LEICHHARDT HIGHWAY
WESTERN CREEK
CONDAMINE RIVER
HODGSON CREEK
GORE HIGHWAY
YARRILL CREEK
WYAGA CREEK
CANNING CREEK
MILLMERRAN-INGLEWOOD ROAD
TOOWOOMBA - KARARA ROAD
CASTLEREAGH HIGHWAY
THE GLEER
BARWON HIGHWAY
COMMORON CREEK
CUNNINGHAM H/GHWAY
SANDY CREEK
WEIR RIVER
PIGGY PIGGY CREEK
CALLANDOON BRANCH
GRADINA CREEK
BRIGALOW CREEK
BRACKER CREEK
INGLEWOOD-TEXAS ROAD
CARNARVON HIGHWAY
DUNAREGO RIVER
BRUSH CREEK
PIKE CREEK
STANTHORPE-TEXAS ROAD
MOSBINDA CREEK
BRUXNER HIGHWAY
WHALAN CREEK
BOOMI RIVER
OTTLEYS CREEK
MOLE RIVER
CAROLE CREEK
WALLON CREEK
NEWELL HIGHWAY
GIL GIL CREEK
CROPPA CREEK
WARIALDA ROAD
BEARDY RIVER
GINGHAM WATERCOURSE
MARSHALLS PONDS CREEK
FRATERS CREEK
KINGS PLAINS CREEK
GWYDIR RIVER
MOSQUITO CREEK
MEHI RIVER
GOONAL CREEK
GWYDIR HIGHWAY
TARRAN CREEK
WARIALDA CREEK
SEVERN RIVER
MALLOWA CREEK
TYCANNAH CREEK
GURLEY CREEK
MOOMIN CREEK
THALABA CREEK
MILLIE CREEK
HORTON RIVER
MYALL CREEK
BEARDY WATERS

LEGEND
- Settlements
- Major Roads
- Rail Network
- Major Watercourses
- Qld Local Government Area
- Maximum Flood Event

Sunwater Storage Infrastructure
- Dam
- Weir
- Dam Ponded Area

REVISION					
28/10/22	C	LOCAL GOVERNMENT AREA BOUNDARY	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250025 - Sunny Day Failure
250026 - Design Crest Flood
250027 - Probable Maximum Flood
250028 - Probable Maximum Precipitation Design Flood

SCALES (A3 SIZE)
0 10 20 30 40 50 km 1:1,000,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
INUNDATION PLANS
KEYMAP

CONTRACT NUMBER
DRAWING NUMBER 250024
REV. C
SHEET 1 OF 1
DATE SEPTEMBER 2018

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Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

151°24'0"E 151°26'0"E 151°28'0"E 151°30'0"E 151°32'0"E 151°34'0"E 151°36'0"E 151°38'0"E

28°56'0"S 28°58'0"S 29°0'0"S 29°20'0"S 29°40'0"S

Lake Glenlyon
GLENLYON DAM
PIKE CREEK
Dumaresq River
SEVERN RIVER
Tea Tree Creek
Back Creek
PERMANENTS ROAD
GLENLYON DAM ROAD
ROMANI LANE
KENYON LANE
PINNACLE ROAD
BRUXNER HIGHWAY
RIVERTON ROAD

AMTD markers: 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0, 186, 185, 184, 183, 182, 181, 180, 179, 178, 177, 176, 175, 187, 188, 189, 190, 191, 192, 193, 194, 195

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION				
DATE		REMARKS	CKD	PSD
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	IDH
DESIGNED	
CHECKED	
CHECKED	MGH
APPROVED	M.G. HUGHES 14/12/2018
RPEQ:	18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250025
REV. B
SHEET 1 OF 37
DATE SEPTEMBER 2018

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Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

151°24'0"E 151°26'0"E 151°28'0"E 151°30'0"E 151°32'0"E 151°34'0"E 151°36'0"E 151°38'0"E

29°6'0"S 29°8'0"S 29°10'0"S 29°12'0"S 29°14'0"S

Back Creek
BACK CREEK ROAD
RIVERTON ROAD
BRUXNER HIGHWAY

AMTD markers: 174, 173, 172, 171, 170, 169, 168, 167, 166, 165, 164, 163, 162, 161, 160

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION				
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH | DESIGNED
CHECKED | CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018 RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250025 | REV. B
SHEET 2 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
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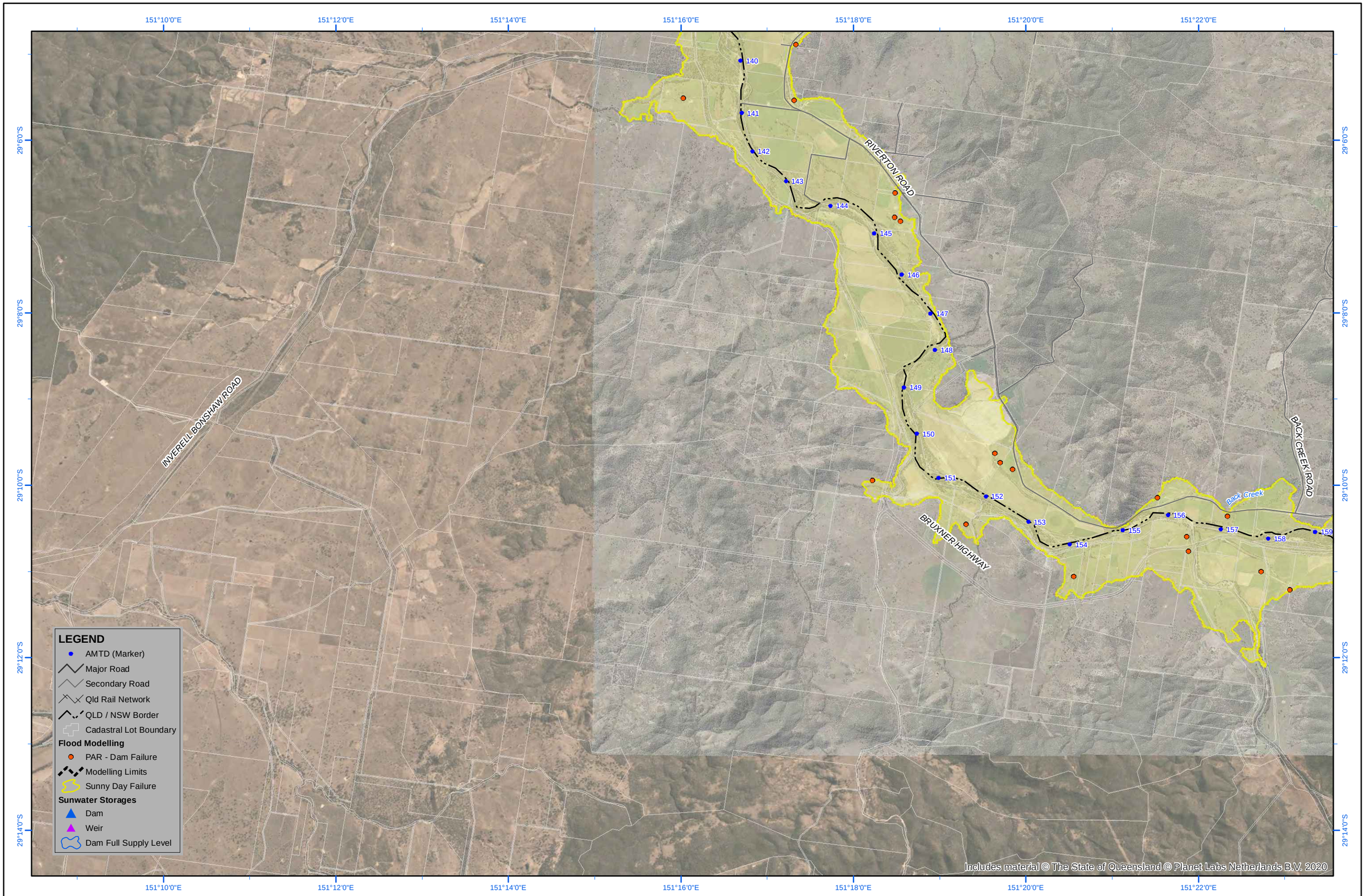

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

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©SUNWATER LIMITED
ACN 131 034 985

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 3 OF 37
DATE SEPTEMBER 2018

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

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Map Produced By:
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Tel: (07) 3120 0000

151°10'0"E 151°12'0"E 151°14'0"E 151°16'0"E 151°18'0"E 151°20'0"E 151°22'0"E

28°56'0"S 28°58'0"S 29°0'0"S 29°20'0"S 29°40'0"S

Raleigh
BONSHAW
Bonshaw Weir
BRUXNER HIGHWAY
RIVERTON ROAD
PINNACLE ROAD
INVERELL BONSHAW ROAD

116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
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GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
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INUNDATION PLAN

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SHEET 4 OF 37

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151°10'0"E 151°12'0"E 151°14'0"E 151°16'0"E 151°18'0"E 151°20'0"E 151°22'0"E

28°46'0"S
28°48'0"S
28°50'0"S
28°52'0"S
28°54'0"S

ARCOT ROAD
Back Creek
WAVERLY LANE
DOHERTYS LANE
Oaky Creek
INGLEWOOD TEXAS ROAD
KEMPS LANE
TEXAS YELARBON ROAD
OLD TEXAS YELARBON ROAD
TEXAS
FLEMMING STREET
POTTERS LANE
STANTHORPE TEXAS ROAD
SILVER SPUR
SILVER SPUR REDGATE ROAD
LITTLE PLAIN CREEK ROAD
RALEIGH ROAD
GLOVERS TEA TREE CREEK ROAD
RIVERTON ROAD
BRUXNER HIGHWAY
102 103 104 105 106 107 108 109 110 111 112 113 114 115

LEGEND
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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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150°54'0"E 150°56'0"E 150°58'0"E 151°0'0"E 151°2'0"E 151°4'0"E 151°6'0"E 151°8'0"E

28°46'0"S 28°48'0"S 28°50'0"S 28°52'0"S 28°54'0"S

JEFFERIES ROAD
SWEEDMANS ROAD
SWEEDMANS ACCESS
SMITHFIELD MUNDOEY ROAD
OAKY CREEK MUNDOEY ROAD
GIBRALTAR MUNDOEY ROAD
TEXAS YELARBON ROAD
BRUXNER HIGHWAY
Oaky Creek
Smithfield

76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101

LEGEND

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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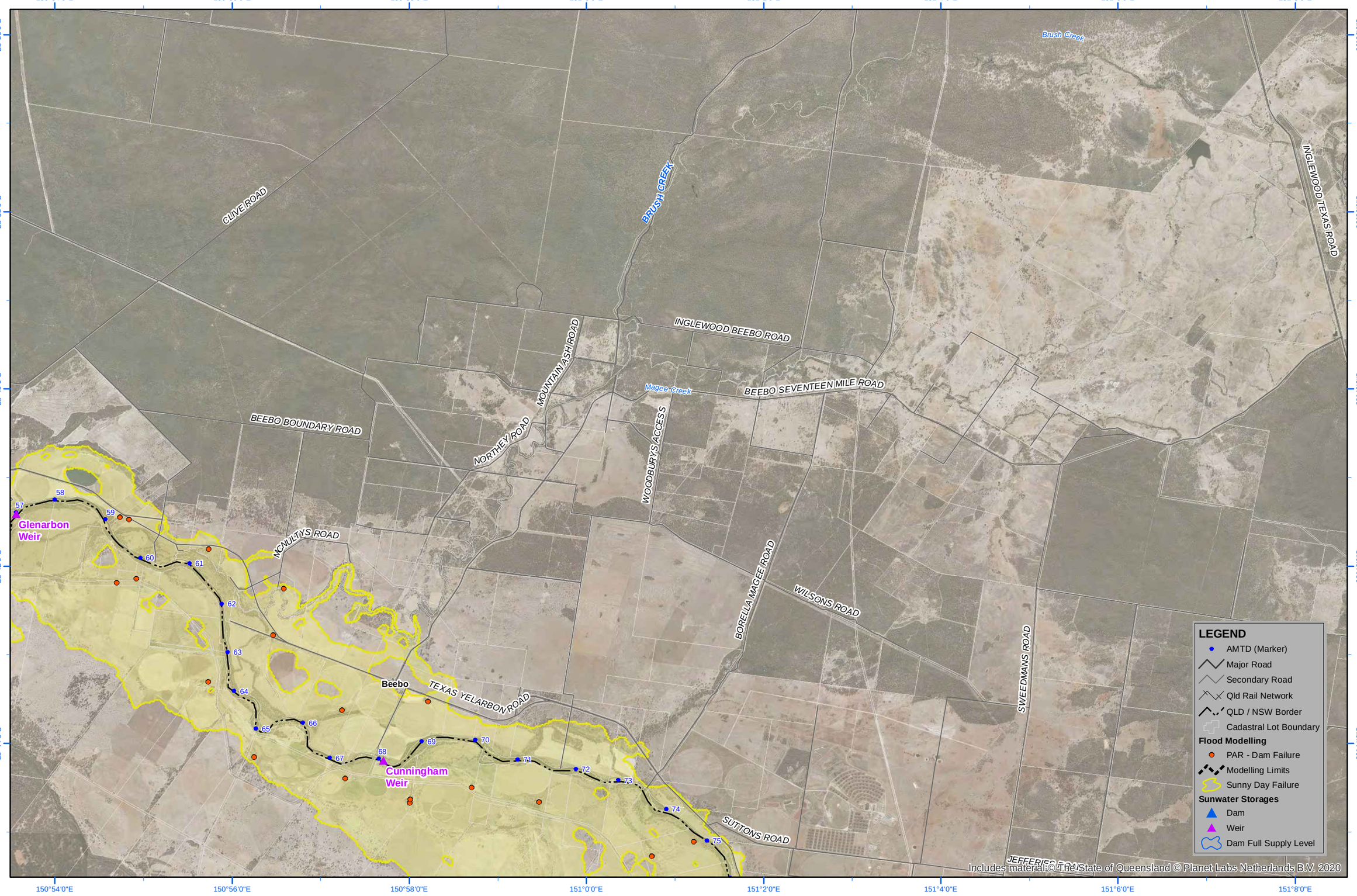

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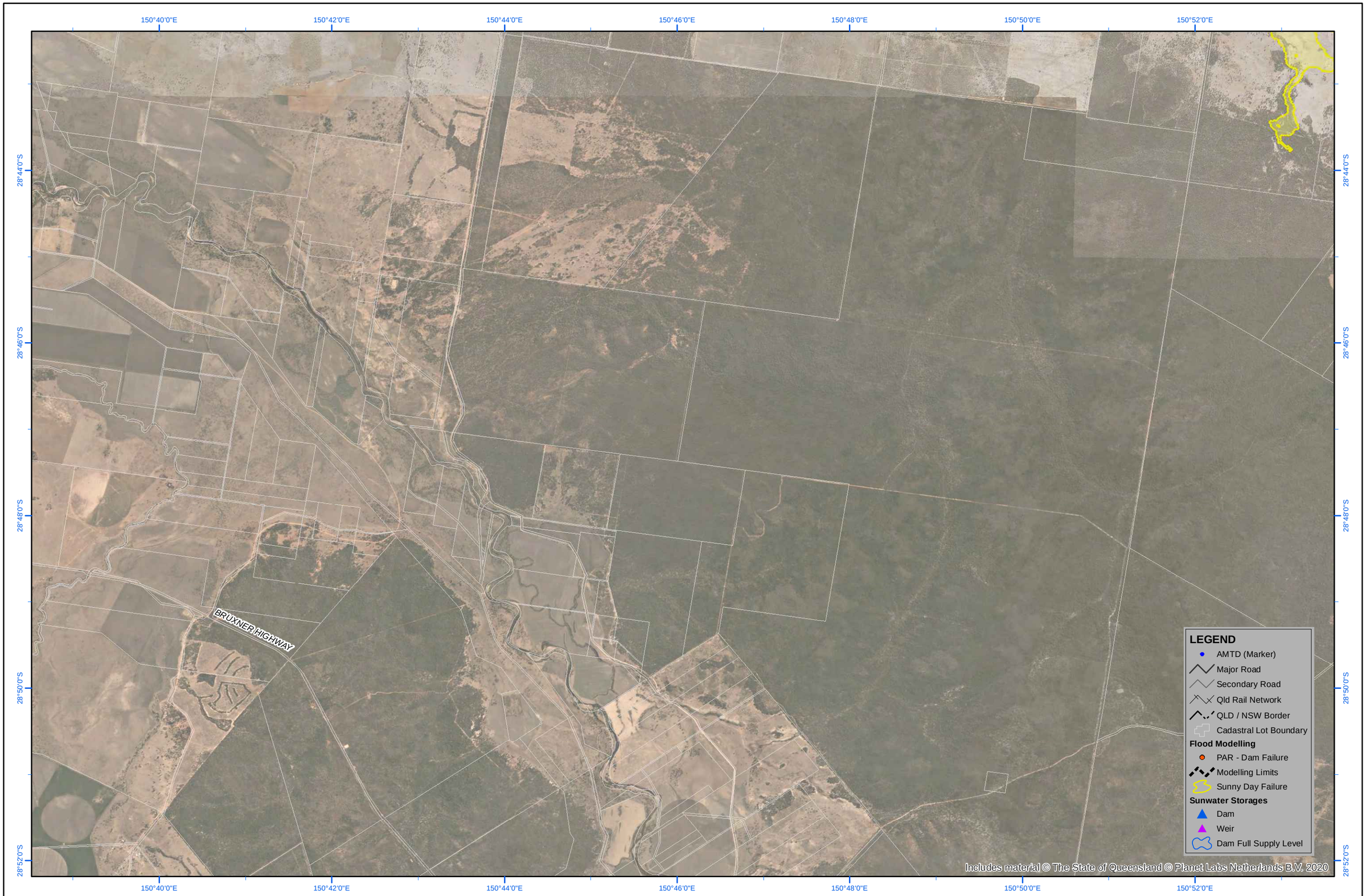

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GLENLYON DAM
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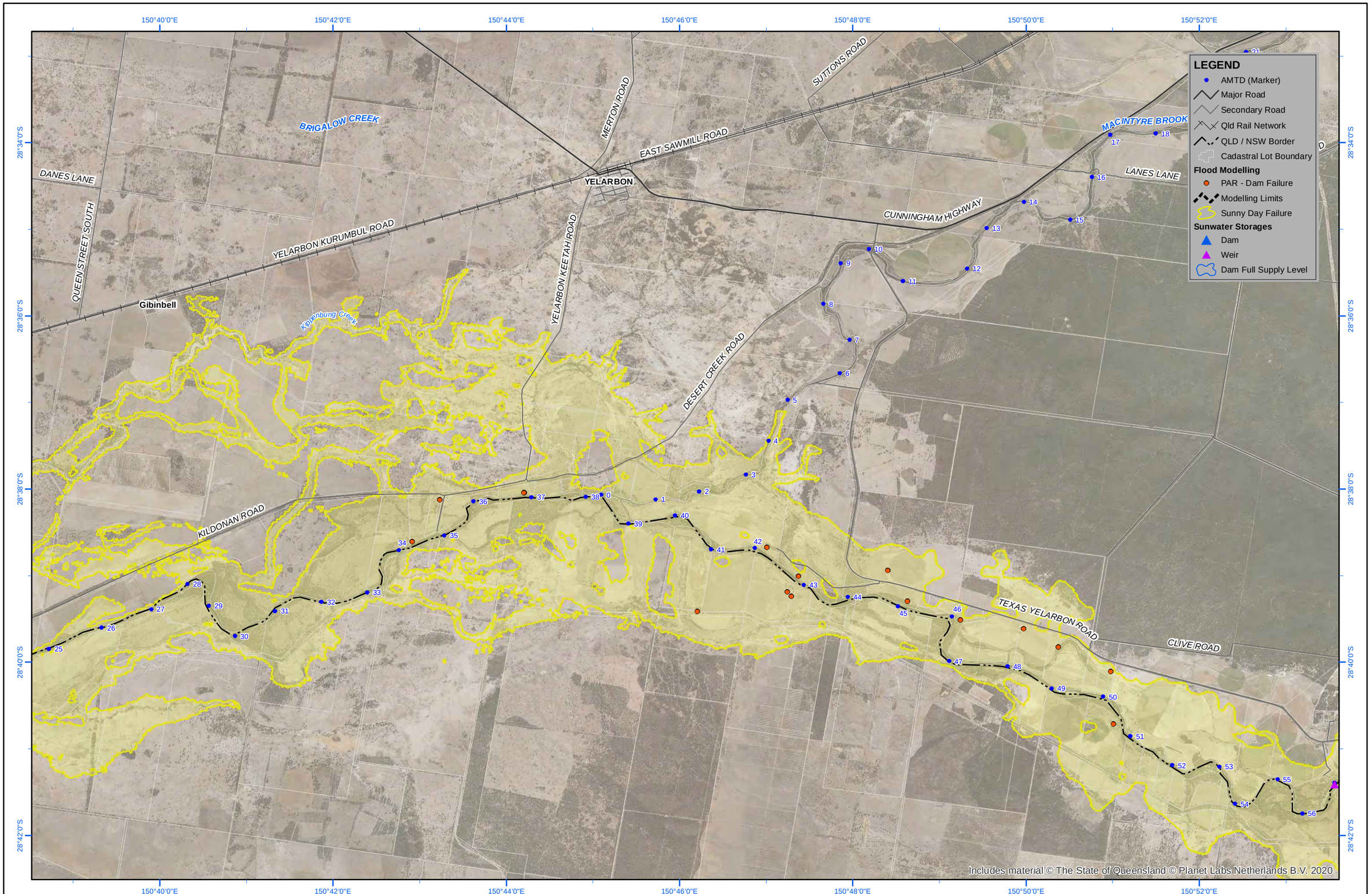

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
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CONTRACT NUMBER
DRAWING NUMBER 250025
REV. B
SHEET 9 OF 37
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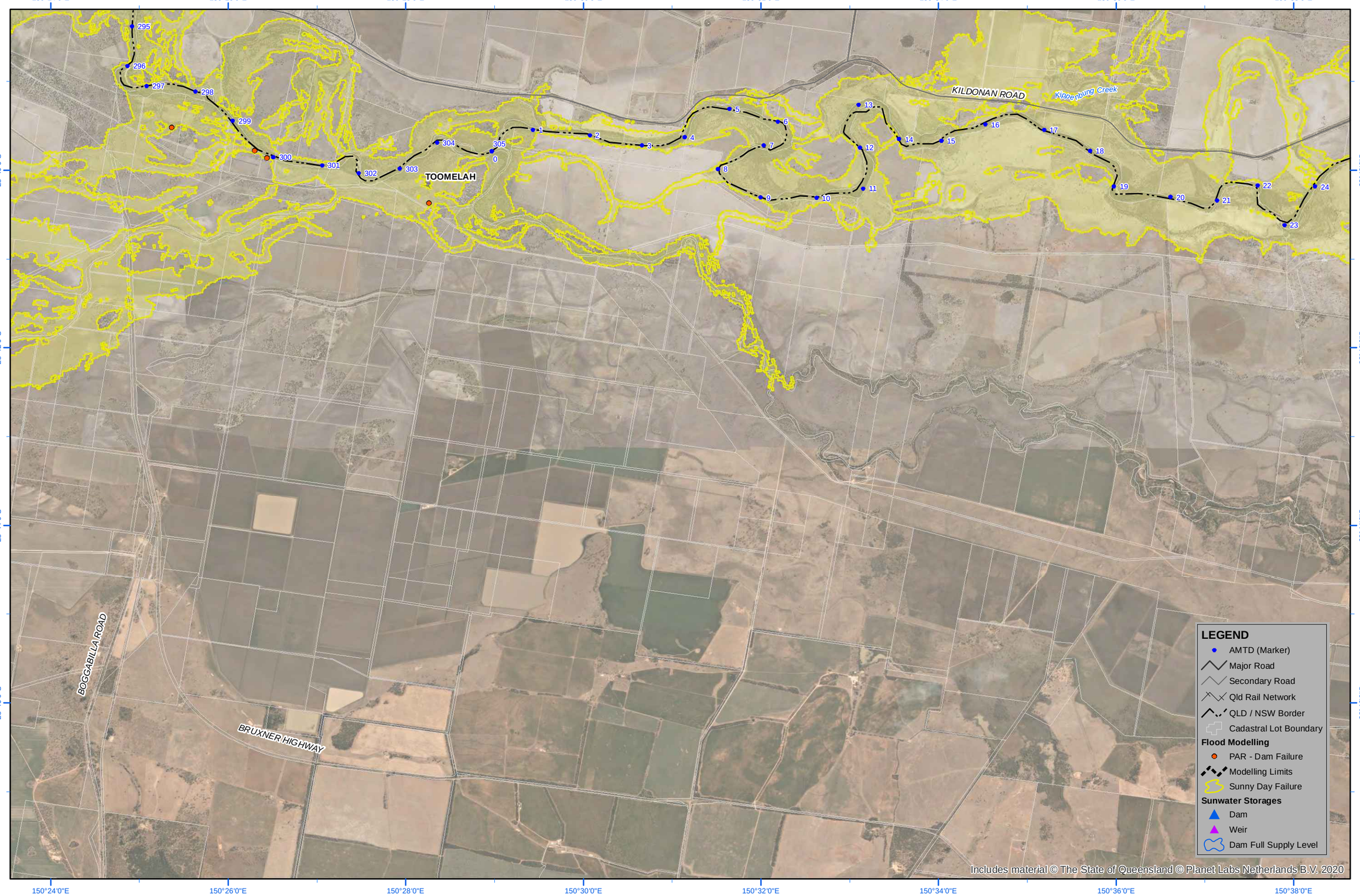

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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SHEET 10 OF 37

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MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

150°24'0"E 150°26'0"E 150°28'0"E 150°30'0"E 150°32'0"E 150°34'0"E 150°36'0"E 150°38'0"E

28°30'0"S 28°32'0"S 28°34'0"S 28°36'0"S 28°38'0"S

POLLOCKS ROAD
BENSONS LANE
Wondalli Creek
CUNNINGHAM HIGHWAY
WAGA ROAD
Murri Murri Creek
PIGGY PIGGY CREEK
MOOROOBIE LANE
WONDALLI KURUMBUL ROAD
DANES LANE
BOGGABILLA LANE
BRIGALOW CREEK
BICKERS ROAD
YELARBON KURUMBUL ROAD
GEORGES LANE
Kildonan
Kurumbul
SOUTH KURUMBUL ROAD
Kippenbung Creek
KILDONAN ROAD
EUKABILLA ROAD
293
292
294

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
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M.G. HUGHES 14/12/2018	RPEQ: 18351

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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SHEET 11 OF 37

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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CONTRACT NUMBER

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250025	B

SHEET 12 OF 37

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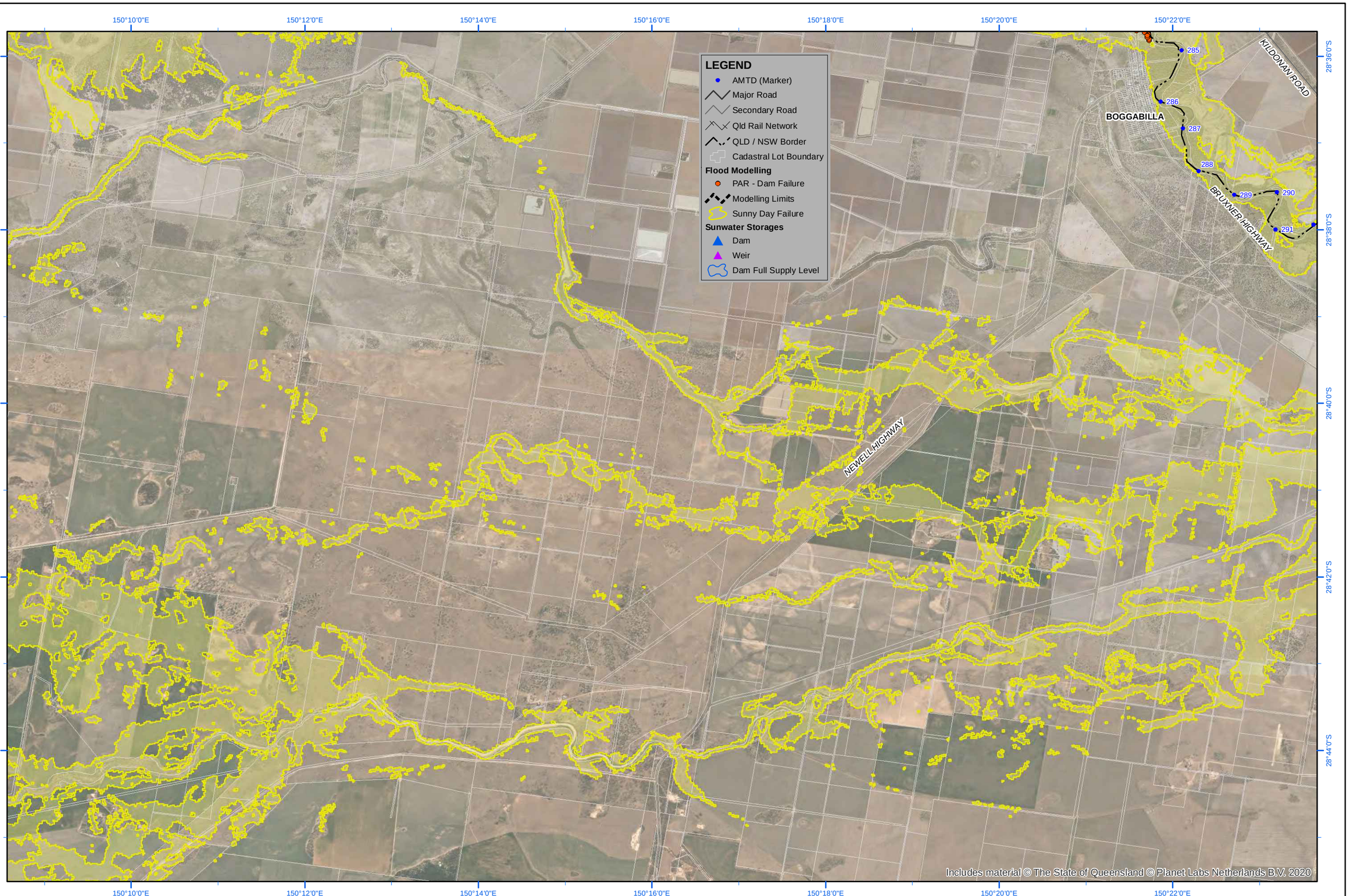

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150°10'0"E 150°12'0"E 150°14'0"E 150°16'0"E 150°18'0"E 150°20'0"E 150°22'0"E

28°28'0"S 28°30'0"S 28°32'0"S 28°34'0"S

YAMBOCULLY CREEK
GOODAR ROAD
LEICHHARDT HIGHWAY
Murri Murri Cree
Wondalli Creek
CUNNINGHAM HIGHWAY
Callandoon North
BARWON HIGHWAY
HENSLER ROAD
ASH ROAD
DEANS ROAD
PEGLERS ROAD
POLO ROAD
CALLANDOON ROAD
BOUNDARY ROAD
BRENNANS ROAD
PIGGY PIGGY CREEK
EASTON ROAD
LAMBERTH ROAD
ROUNDABOUT
JOHNSTON ROAD
GOONDIWINDI
BOWEN LANE
CEMETERY ROAD
MOOROOBIE LANE
KILDONAN ROAD
NEWELL HIGHWAY
Goondiwindi Weir
Boggabilla Weir

242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283

LEGEND

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28°18'0"S 28°20'0"S 28°22'0"S 28°24'0"S 28°26'0"S

Billa Billa Creek
YARRILL CREEK
AKARINGA ROAD
LEICHHARDT HIGHWAY
GORE HIGHWAY
TEELEBAR ROAD
COMMORON CREEK
GOODAR ROAD
JACKSONS ROAD
SCUDAMORES ROAD
YAMBOCULLY CREEK
Murri Murri Creek

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SHEET 16 OF 37

DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

149°54'0"E 149°56'0"E 149°58'0"E 150°0'0"E 150°2'0"E 150°4'0"E 150°6'0"E 150°8'0"E

28°36'0"S 28°38'0"S 28°40'0"S 28°42'0"S 28°44'0"S

192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER	
DRAWING NUMBER	REV.
250025	B
SHEET 17 OF 37	
DATE SEPTEMBER 2018	

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°54'0"E 149°56'0"E 149°58'0"E 150°0'0"E 150°2'0"E 150°4'0"E 150°6'0"E 150°8'0"E

28°28'0"S 28°30'0"S 28°32'0"S 28°34'0"S

GOORAY ROAD
Gooray
Booberanna Creek
SOUTH WINTON ROAD
BARWON HIGHWAY
Beryl Watercourse
Callandoon Branch
CALLANDOON BRANCH
CALLANDOON ROAD

211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
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REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

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IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250025 | REV. B

SHEET 18 OF 37

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149°54'0"E 149°56'0"E 149°58'0"E 150°0'0"E 150°2'0"E 150°4'0"E 150°6'0"E 150°8'0"E

28°18'0"S 28°20'0"S 28°22'0"S 28°24'0"S 28°26'0"S

BURUMBAH ROAD
Uragara Creek
MINNEL ROAD
EURONE ROAD
GOORAY ROAD
COMMORON CREEK
WEIR RIVER
YAMBOCULLY CREEK
BARWON HIGHWAY
Nula
Booberanna Creek

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
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Sunwater Storages

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REVISION					
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DATE		REMARKS	CKD	PSD	

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0 750 1,500 2,250 3,000 3,750 m
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IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 19 OF 37

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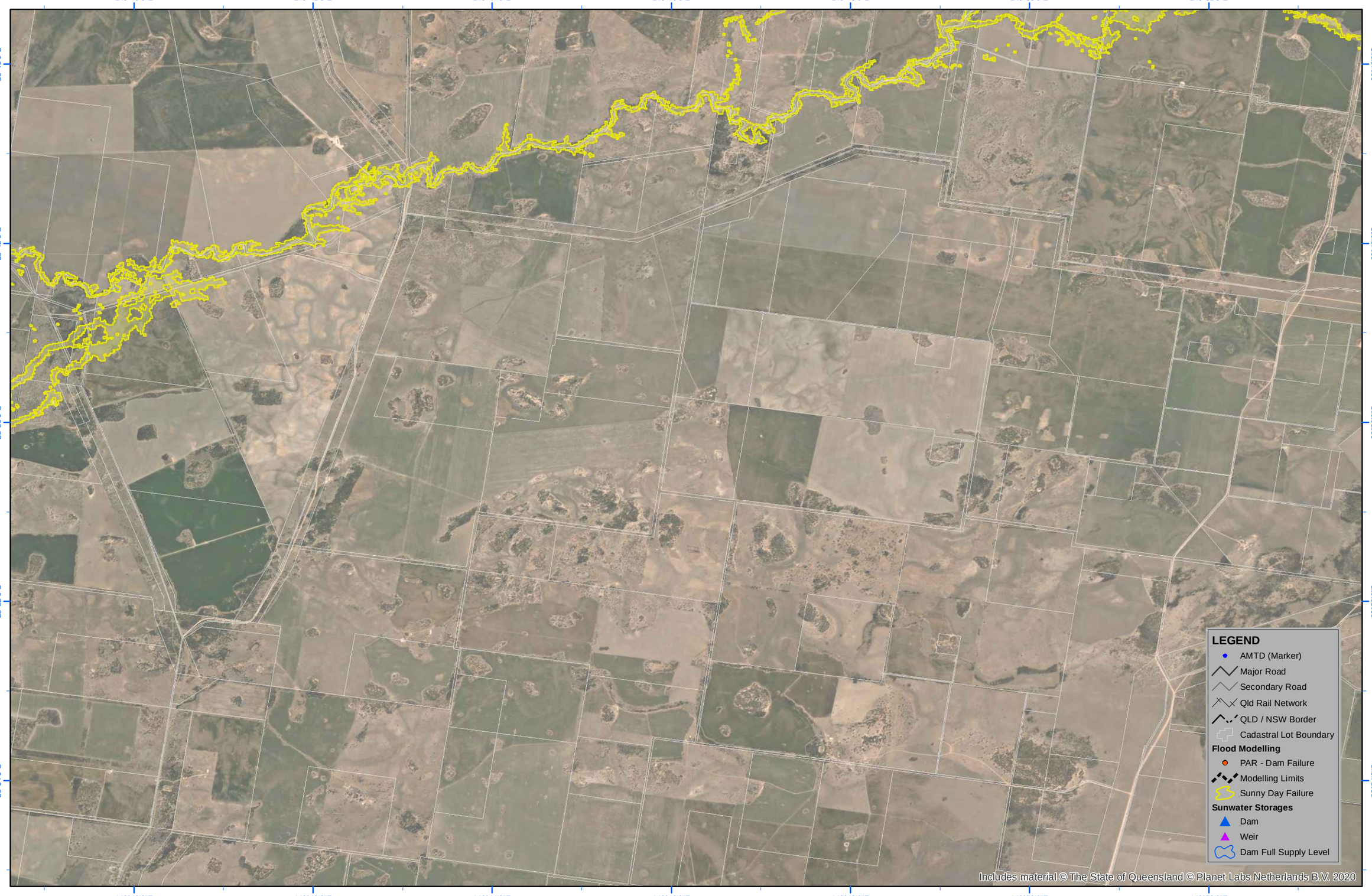
Tel: (07) 3120 0000

149°40'0"E 149°42'0"E 149°44'0"E 149°46'0"E 149°48'0"E 149°50'0"E 149°52'0"E

28°46'0"S
28°48'0"S
28°50'0"S
28°52'0"S
28°54'0"S



REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

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0 750 1,500 2,250 3,000 3,750 m
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IDH	
CHECKED	CHECKED
	MGH

APPROVED
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14/12/2018
RPEQ: 18351

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 20 OF 37

DATE SEPTEMBER 2018

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149°40'0"E 149°42'0"E 149°44'0"E 149°46'0"E 149°48'0"E 149°50'0"E 149°52'0"E

28°36'0"S 28°38'0"S 28°40'0"S 28°42'0"S 28°44'0"S

CALLANDOON BRANCH

Coomonga Creek Weir

Boomi Diversion Weir

143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

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REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

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IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 21 OF 37

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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°40'0"E 149°42'0"E 149°44'0"E 149°46'0"E 149°48'0"E 149°50'0"E 149°52'0"E

28°28'0"S
28°30'0"S
28°32'0"S
28°34'0"S

Welltown
BARWON HIGHWAY
SOUTH WELLTOWN ROAD
SOUTH T
Yarrawanna Creek
Booberanna Creek
Kiddy Gearan Creek
CALLANDOON BRANCH
DONOVANS ROAD
JAMIESONS ROAD
Momonga Creek

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 22 OF 37

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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°40'0"E 149°42'0"E 149°44'0"E 149°46'0"E 149°48'0"E 149°50'0"E 149°52'0"E

28°18'0"S 28°20'0"S 28°22'0"S 28°24'0"S 28°26'0"S

TALWOOD MEANDARRA ROAD
GLENGOWER ROAD
KIOMA ROAD
MEANDARRA TALWOOD ROAD
WEIR RIVER
MINNEL ROAD
BARWON HIGHWAY
BUNGUNYA
TOOBEAH
Boggera Creek
Minnel Creek
Uragara Creek
Yarriwanna Creek

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH | DESIGNED
CHECKED | CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018 RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250025 | REV. B
SHEET 23 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResource\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°24'0"E 149°26'0"E 149°28'0"E 149°30'0"E 149°32'0"E 149°34'0"E 149°36'0"E 149°38'0"E

28°56'0"S
28°58'0"S
29°0'0"S
29°20'0"S
29°40'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION				
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
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REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH | DESIGNED
CHECKED | CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018 RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250025 | REV. B
SHEET 24 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
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MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

149°24'0"E 149°26'0"E 149°28'0"E 149°30'0"E 149°32'0"E 149°34'0"E 149°36'0"E 149°38'0"E

28°46'0"S
28°48'0"S
28°50'0"S
28°52'0"S
28°54'0"S

BOOMI CALOONA ROAD

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION				
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
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REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
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DRAWN	DESIGNED
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	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 25 OF 37

DATE SEPTEMBER 2018

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149°24'0"E 149°26'0"E 149°28'0"E 149°30'0"E 149°32'0"E 149°34'0"E 149°36'0"E 149°38'0"E

28°36'0"S 28°38'0"S 28°40'0"S 28°42'0"S 28°44'0"S

WEIR RIVER

BOOMI CALOONA ROAD

BOOMI

96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 137 138 139 140 141 142

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION				
DATE		REMARKS	CKD	PSD
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

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CHECKED	CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250025 | REV. B

SHEET 26 OF 37

DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
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149°24'0"E 149°26'0"E 149°28'0"E 149°30'0"E 149°32'0"E 149°34'0"E 149°36'0"E 149°38'0"E

28°28'0"S 28°30'0"S 28°32'0"S 28°34'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
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- QLD / NSW Border
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Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

NORTH TALWOOD ROAD
Redbank Creek
Bomblymina Creek
Yarriwanna Creek
BARWON HIGHWAY
Lalaguli
TALWOOD
GRADNA CREEK
WEIR RIVER
TALWOOD BOONANGA ROAD
TALWOOD MUNGINDI ROAD
Booberanna Creek
Momonga Creek
Weir River

112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
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	MGH

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14/12/2018
RPEQ: 18351

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 27 OF 37
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28°18'0"S
28°20'0"S
28°22'0"S
28°24'0"S
28°26'0"S

NORTH GRADNA ROAD
BUNGUNYA ALTON ROAD
NORTH TALWOOD ROAD
Boogara Creek
Wongamali Creek
Bombyanna Creek
Redbank Creek
WEIR RIVER
BARWON HIGHWAY

LEGEND

- AMTD (Marker)
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GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
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CONTRACT NUMBER
DRAWING NUMBER 250025 | REV. B
SHEET 28 OF 37
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149°10'0"E 149°12'0"E 149°14'0"E 149°16'0"E 149°18'0"E 149°20'0"E 149°22'0"E

28°56'0"S
28°58'0"S
29°0'0"S
29°20'0"S
29°40'0"S

LEGEND

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CONTRACT NUMBER
DRAWING NUMBER 250025
REV. B
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149°10'0"E 149°12'0"E 149°14'0"E 149°16'0"E 149°18'0"E 149°20'0"E 149°22'0"E

28°46'0"S
28°48'0"S
28°50'0"S
28°52'0"S
28°54'0"S

Middle Creek
WEIR RIVER
BOOMI CALOONA ROAD

48 49 50 51 52 53 54 55 56 57 58 59 60 61 62

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling
- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION				
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH | DESIGNED
CHECKED | CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018 RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250025 | REV. B
SHEET 30 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

149°10'0"E 149°12'0"E 149°14'0"E 149°16'0"E 149°18'0"E 149°20'0"E 149°22'0"E

28°36'0"S 28°38'0"S 28°40'0"S 28°42'0"S 28°44'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

TALWOOD MUNGINDI ROAD
GRADNA CREEK
Gradnia Creek
Warril Creek
Willarie
Weir River
Merriot
MERRIOT ROAD
WEIR RIVER
Middle Creek

63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95

REVISION					
DATE		REMARKS	CKD	PSD	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH	DESIGNED
CHECKED	CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 31 OF 37

DATE SEPTEMBER 2018

Document: S:\BW_WaterResource\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced by:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°10'0"E 149°12'0"E 149°14'0"E 149°16'0"E 149°18'0"E 149°20'0"E 149°22'0"E

28°28'0"S
28°30'0"S
28°32'0"S
28°34'0"S

WANDIBINDLE ROAD
FEAS ROAD
MCNAULTY ROAD
BARWON HIGHWAY
ARALUEN ROAD
NORTH GRADNA ROAD
Mabin Creek
Gurardera Creek
Warandine Creek
Currintiny Creek
Gradule
SOUTH GRADULE ROAD
Gradule Creek
TALWOOD MUNGINDI ROAD
GRADNA CREEK

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 32 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

148°54'0"E 148°56'0"E 148°58'0"E 149°0'0"E 149°2'0"E 149°4'0"E 149°6'0"E 149°8'0"E

29°6'0"S 29°8'0"S 29°10'0"S 29°12'0"S 29°14'0"S

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 33 OF 37

DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\Glenlyon\Dam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

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28°56'0"S 28°58'0"S 29°0'0"S 29°2'0"S 29°4'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

LITTLE WEIR RIVER
CARNARVON HIGHWAY
WEIR ROAD
BELMORE ROAD
MUNGINDI
GUNNINDADDY ROAD
Mungindi Weir
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

REVISION				
DATE		REMARKS	CKD	PSD
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
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SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

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CHECKED	CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250025 REV. B
SHEET 34 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

148°54'0"E 148°56'0"E 148°58'0"E 149°0'0"E 149°2'0"E 149°4'0"E 149°6'0"E 149°8'0"E

28°46'0"S
28°48'0"S
28°50'0"S
28°52'0"S
28°54'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

CARNARVON HIGHWAY
NOONDOO MUNGINDI ROAD
TALWOOD MUNGINDI ROAD
WEIR RIVER
LITTLE WEIR RIVER

20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 35 OF 37

DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

148°40'0"E 148°42'0"E 148°44'0"E 148°46'0"E 148°48'0"E 148°50'0"E 148°52'0"E

29°6'0"S 29°8'0"S 29°10'0"S 29°12'0"S 29°14'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION					
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
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0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH	DESIGNED
CHECKED	CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250025	B

SHEET 36 OF 37

DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250025-B.mxd
Printed: Tuesday, 25/10/2022 11:36:23 AM

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

148°40'0"E 148°42'0"E 148°44'0"E 148°46'0"E 148°48'0"E 148°50'0"E 148°52'0"E

28°56'0"S
28°58'0"S
29°0'0"S
29°20'0"S
29°40'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- QLD / NSW Border
- Cadastral Lot Boundary

Flood Modelling

- PAR - Dam Failure
- Modelling Limits
- Sunny Day Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

MOONIE RIVER
DINGADEE ROAD
Ballandoon Creek
GUNNINDADDY ROAD
LITTLE WEIR RIVER

REVISION				
DATE		REMARKS	CKD	PSD
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

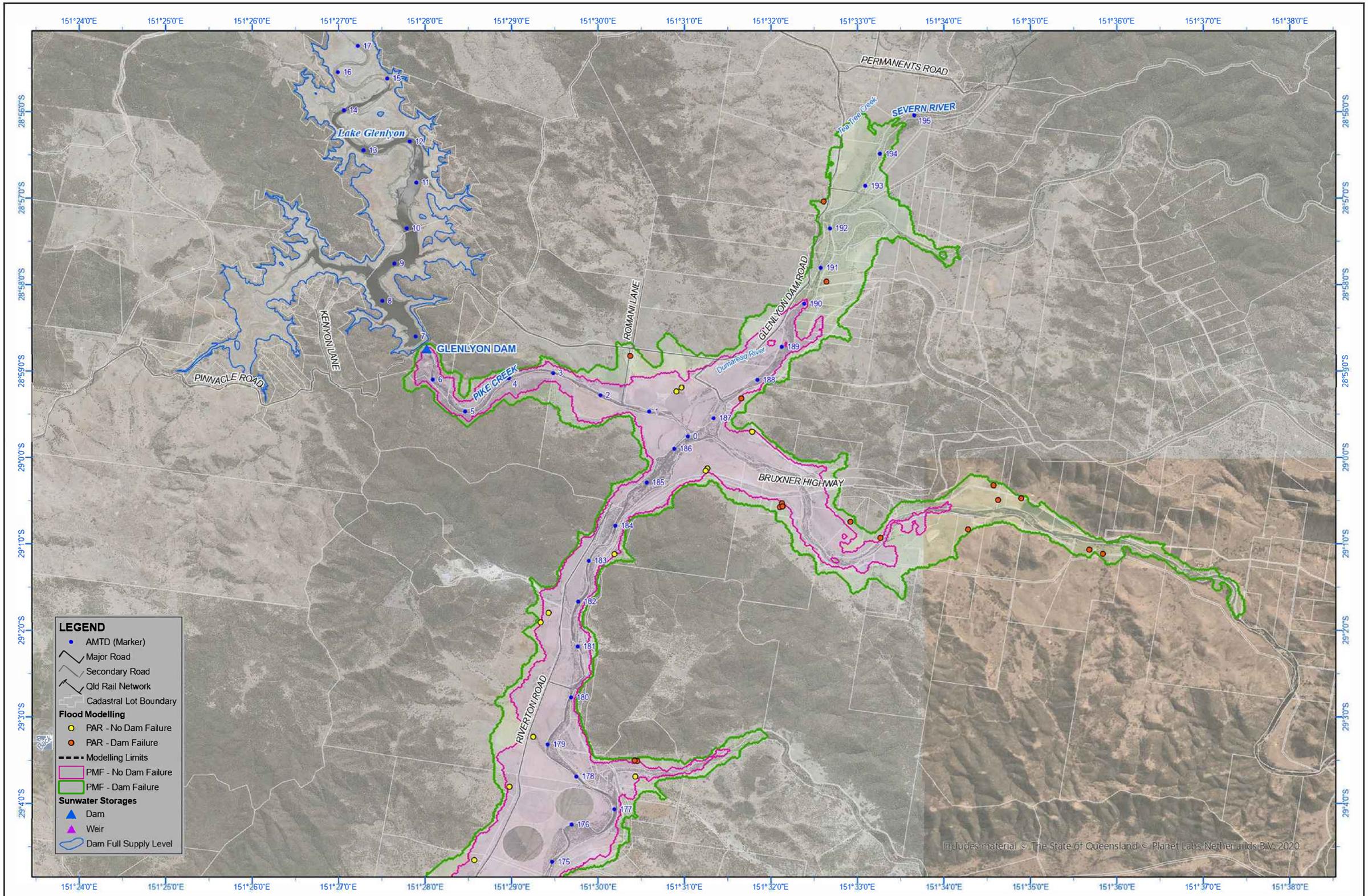
DRAWN: IDH	DESIGNED:
CHECKED:	CHECKED: MGH
APPROVED: M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
SUNNY DAY FAILURE
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER: 250025
REV.: B
SHEET 37 OF 37
DATE SEPTEMBER 2018

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023



REVISION				
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

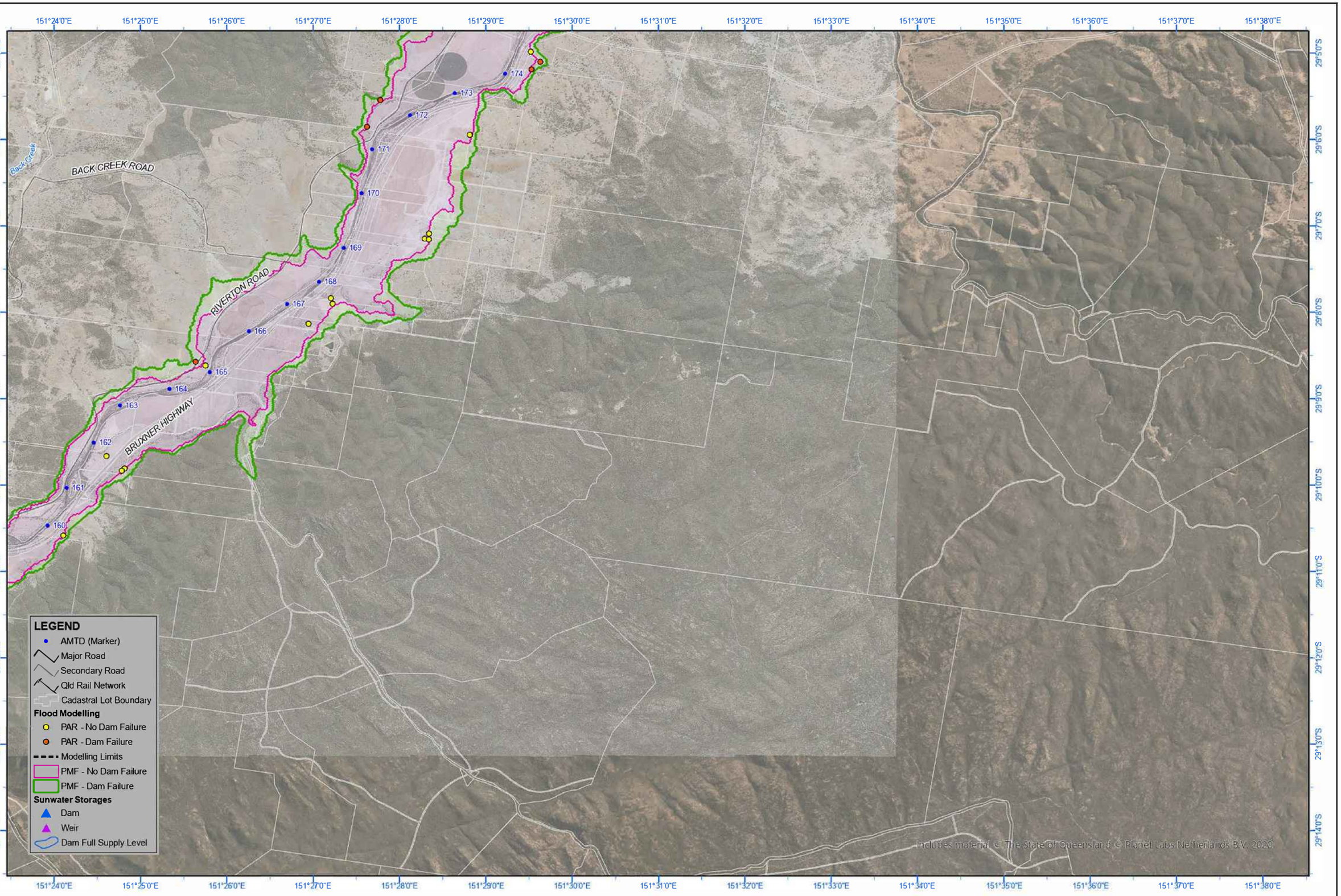
CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 1 OF 37
DATE JUNE 2023

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commission\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023



REVISION					
DATE		REMARKS	CKD	PSD
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER	
DRAWING NUMBER	REV.
250027	C
SHEET 2 OF 37	
DATE JUNE 2023	

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
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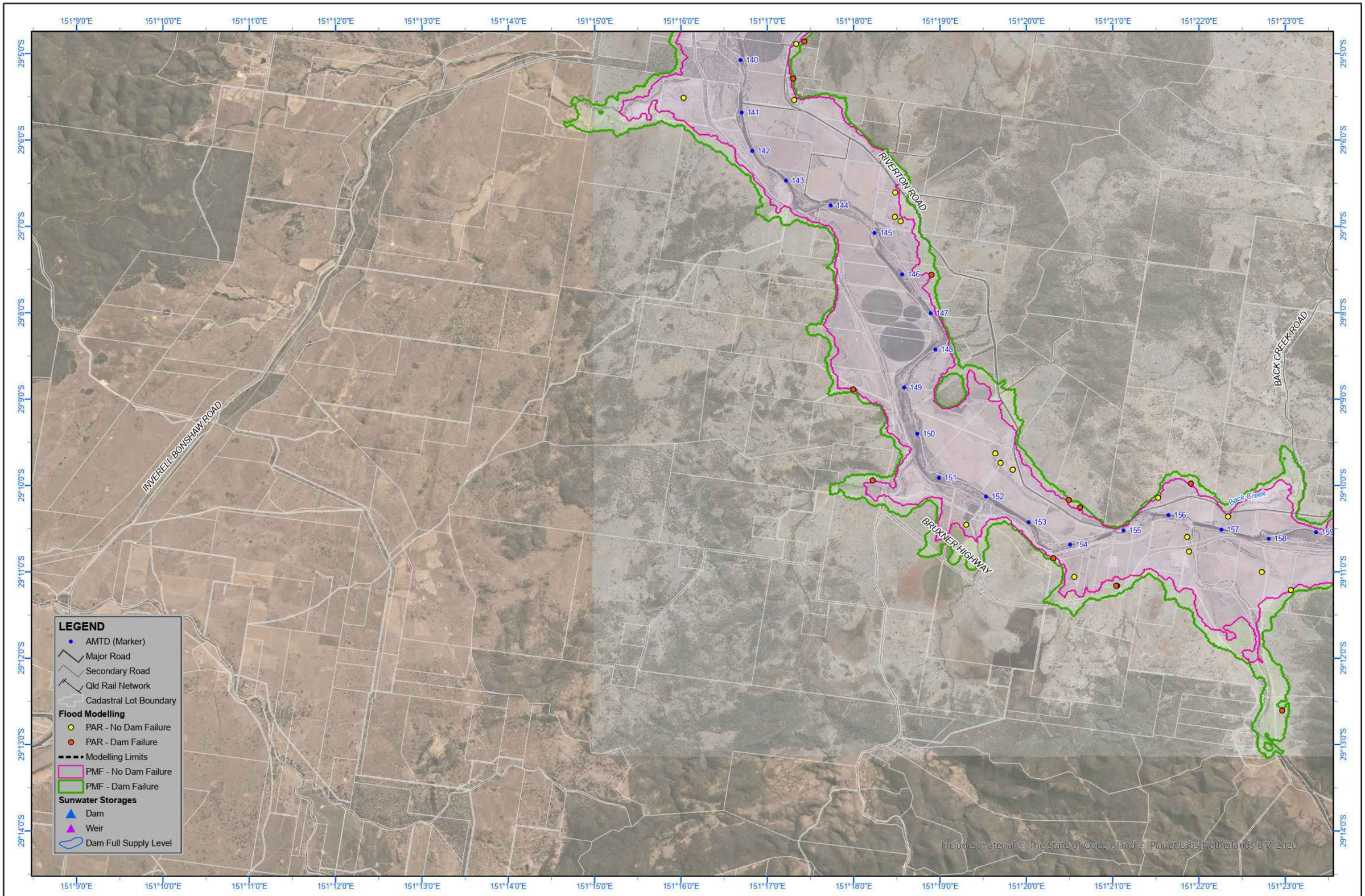
Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023



REVISION					
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 3 OF 37
DATE JUNE 2023

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

151°9'0"E 151°10'0"E 151°11'0"E 151°12'0"E 151°13'0"E 151°14'0"E 151°15'0"E 151°16'0"E 151°17'0"E 151°18'0"E 151°19'0"E 151°20'0"E 151°21'0"E 151°22'0"E 151°23'0"E

29°0'0"S 28°57'0"S 28°58'0"S 28°59'0"S 29°0'0"S 29°10'0"S 29°20'0"S 29°30'0"S 29°40'0"S

Raleigh
BONSHAW
Bonshaw Weir
BRUXNER HIGHWAY
RIVERTON ROAD
PINNACLE ROAD
INVERELL BONSHAW ROAD

116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling
- PAR - No Dam Failure
- PAR - Dam Failure
- Modelling Limits
- PMF - No Dam Failure
- PMF - Dam Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION					
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
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Coordinate System: Geocentric Datum of Australia (GDA2020).

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IDH	
CHECKED	CHECKED
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M.G. HUGHES
14/12/2018
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sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 4 OF 37
DATE JUNE 2023

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Printed: 6 July 2023

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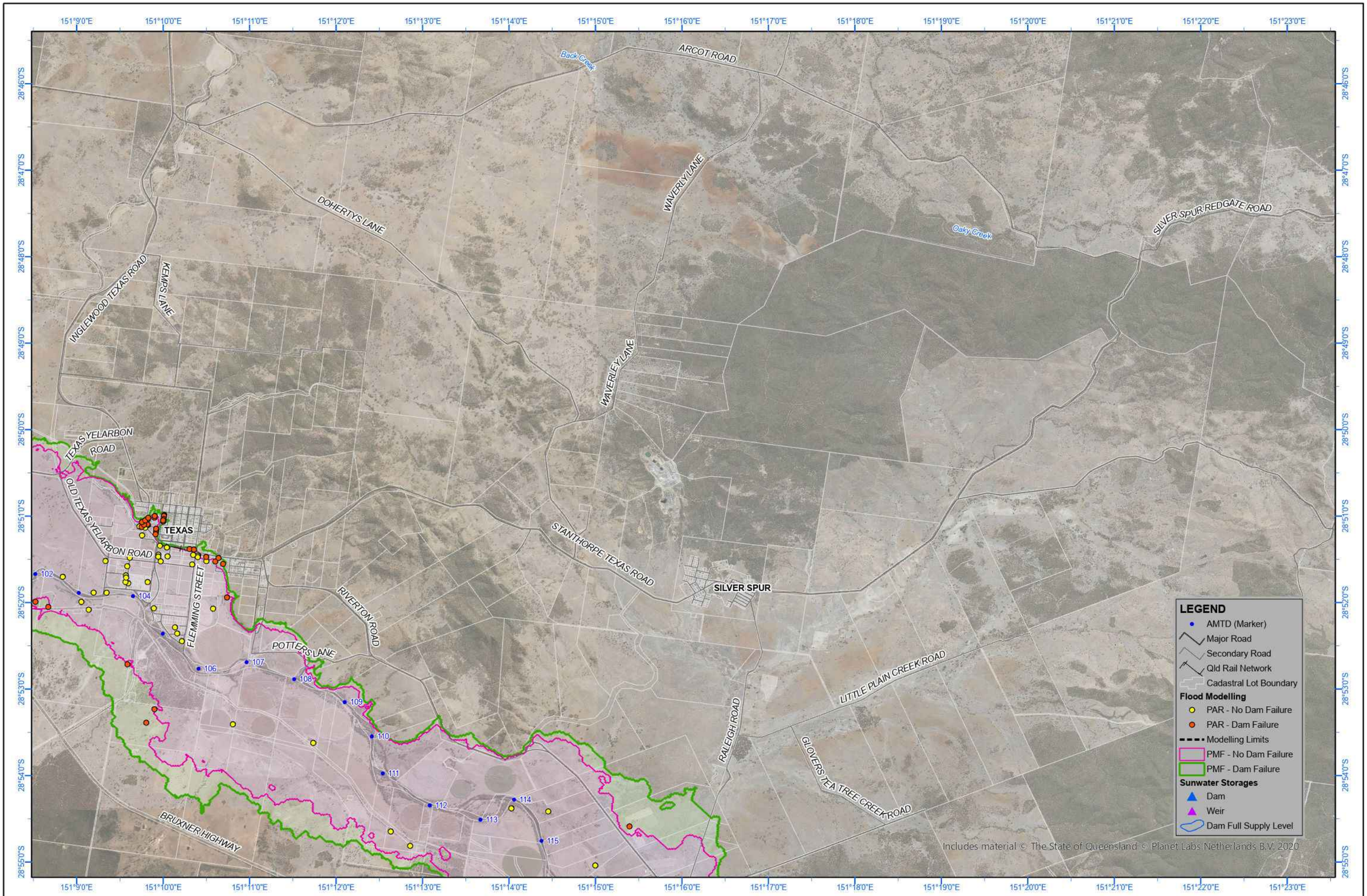
Tel: (07) 3120 0000



REVISION					
06/07/22	C	UPDATED PAR LAYER TITLE	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
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1:75,000

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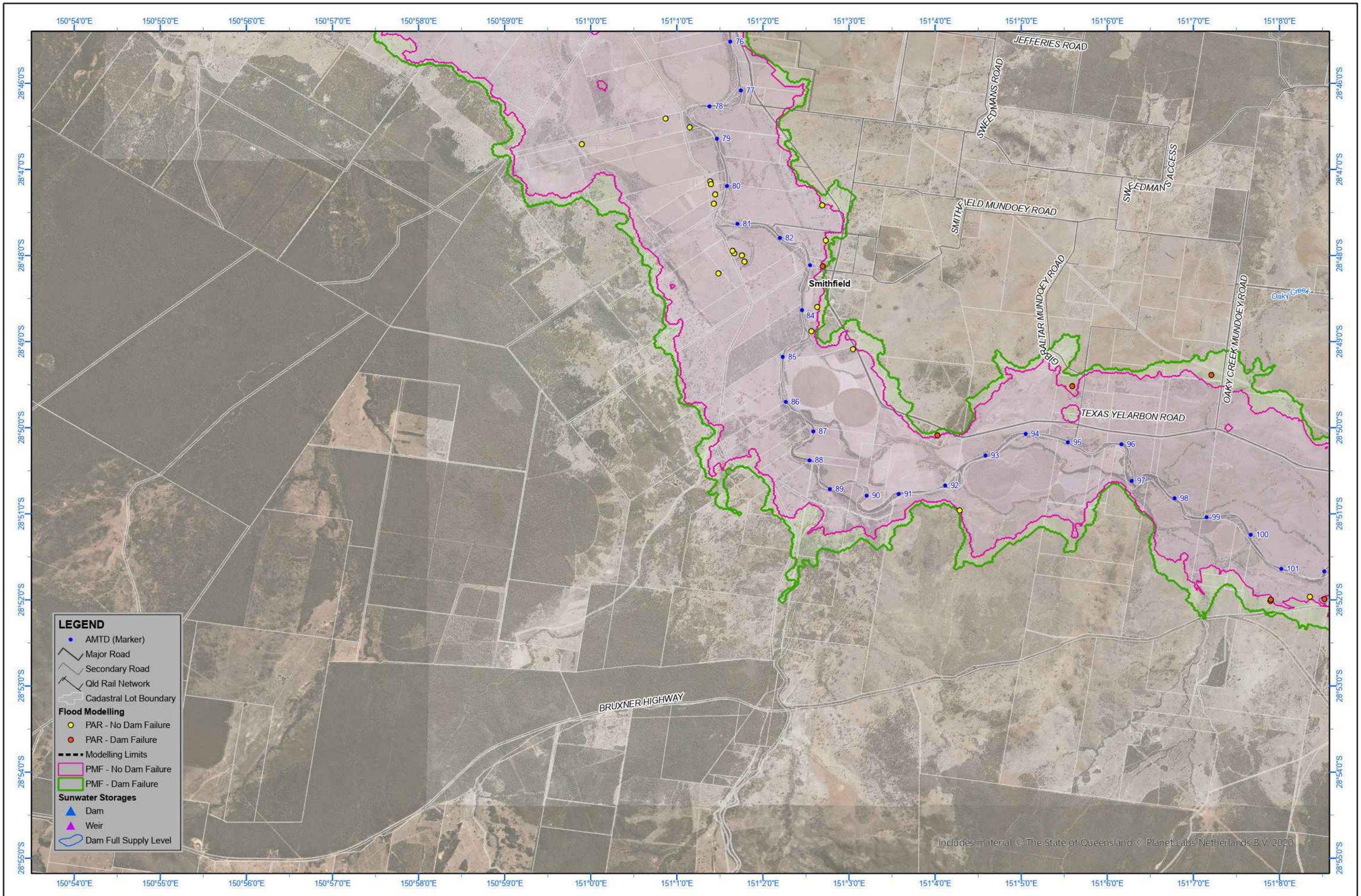
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027
REV. C
SHEET 5 OF 37
DATE JUNE 2023



Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

REVISION				
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH
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0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 6 OF 37

DATE JUNE 2023

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

150°54'0"E 150°55'0"E 150°56'0"E 150°57'0"E 150°58'0"E 150°59'0"E 151°0'0"E 151°1'0"E 151°2'0"E 151°3'0"E 151°4'0"E 151°5'0"E 151°6'0"E 151°7'0"E 151°8'0"E

28°36'0"S 28°37'0"S 28°38'0"S 28°39'0"S 28°40'0"S 28°41'0"S 28°42'0"S 28°43'0"S 28°44'0"S 28°45'0"S

CLIVE ROAD
BRUSH CREEK
Brush Creek
INGLEWOOD TEXAS ROAD
INGLEWOOD BEEBO ROAD
MOUNTAINASH ROAD
Magee Creek
BEEBO SEVENTEEN MILE ROAD
BEEBO BOUNDARY ROAD
NORTHEY ROAD
WOODBURYS ACCESS
BORELLA MAGEE ROAD
MCNULTYS ROAD
WILSONS ROAD
SWEEDMANS ROAD
TEXAS YELARBON ROAD
SUTTONS ROAD
JEFFERIES ROAD
Beebo
Glenarbon Weir
Cunningham Weir
58 60 61 62 63 64 65 66 67 69 70 71 72 73 74 75

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling
- PAR - No Dam Failure
- PAR - Dam Failure
- Modelling Limits
- PMF - No Dam Failure
- PMF - Dam Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION					
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH	DESIGNED
CHECKED	CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027
REV. C
SHEET 7 OF 37
DATE JUNE 2023

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

150°39'0"E 150°40'0"E 150°41'0"E 150°42'0"E 150°43'0"E 150°44'0"E 150°45'0"E 150°46'0"E 150°47'0"E 150°48'0"E 150°49'0"E 150°50'0"E 150°51'0"E 150°52'0"E 150°53'0"E

28°43'0"S 28°44'0"S 28°45'0"S 28°46'0"S 28°47'0"S 28°48'0"S 28°49'0"S 28°50'0"S 28°51'0"S 28°52'0"S

BRUXNER HIGHWAY

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling

- PAR - No Dam Failure
- PAR - Dam Failure
- Modelling Limits
- PMF - No Dam Failure
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Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

REVISION					
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0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 8 OF 37
DATE JUNE 2023

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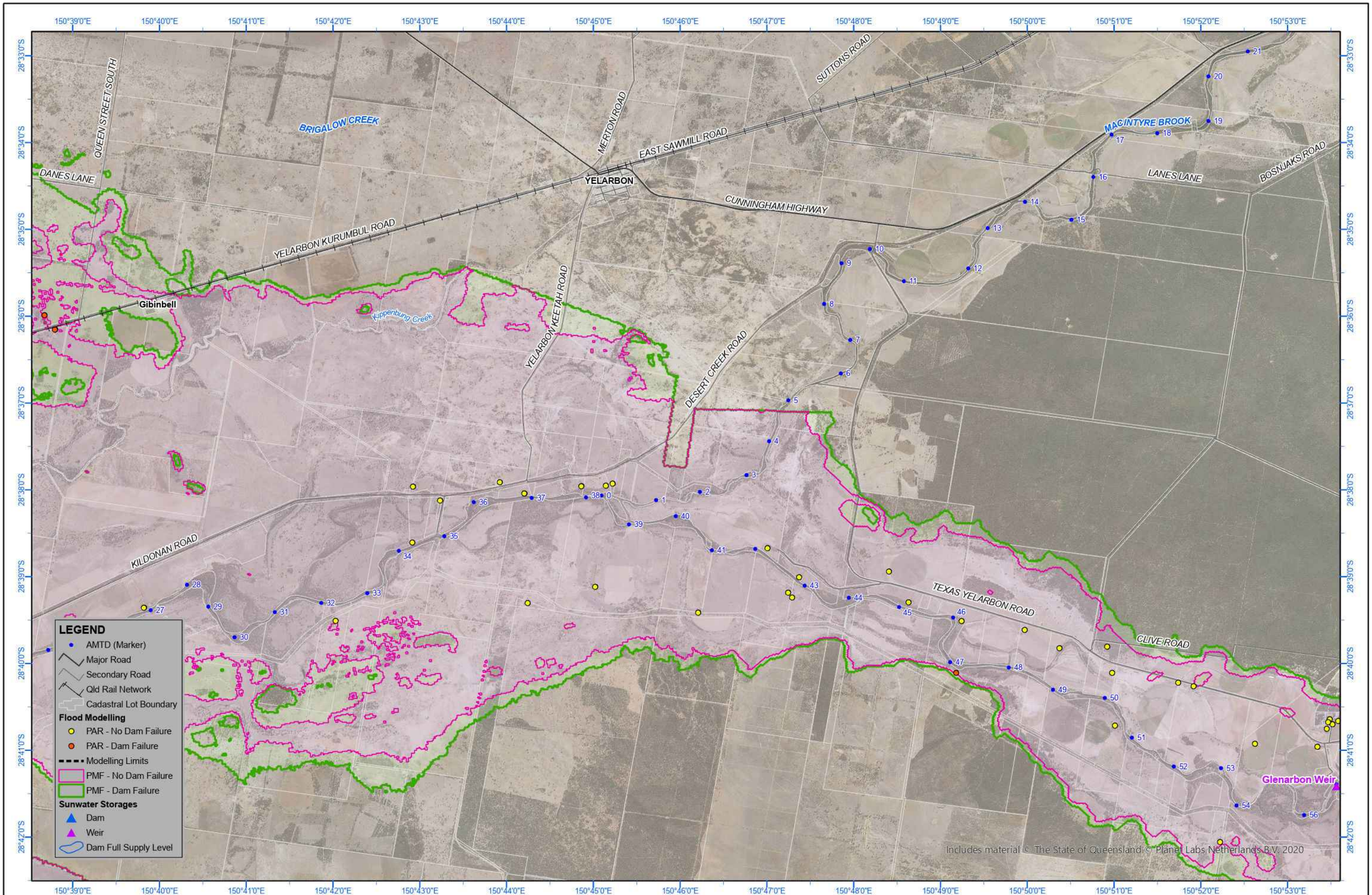

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25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
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	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250027 | REV. C

SHEET 9 OF 37

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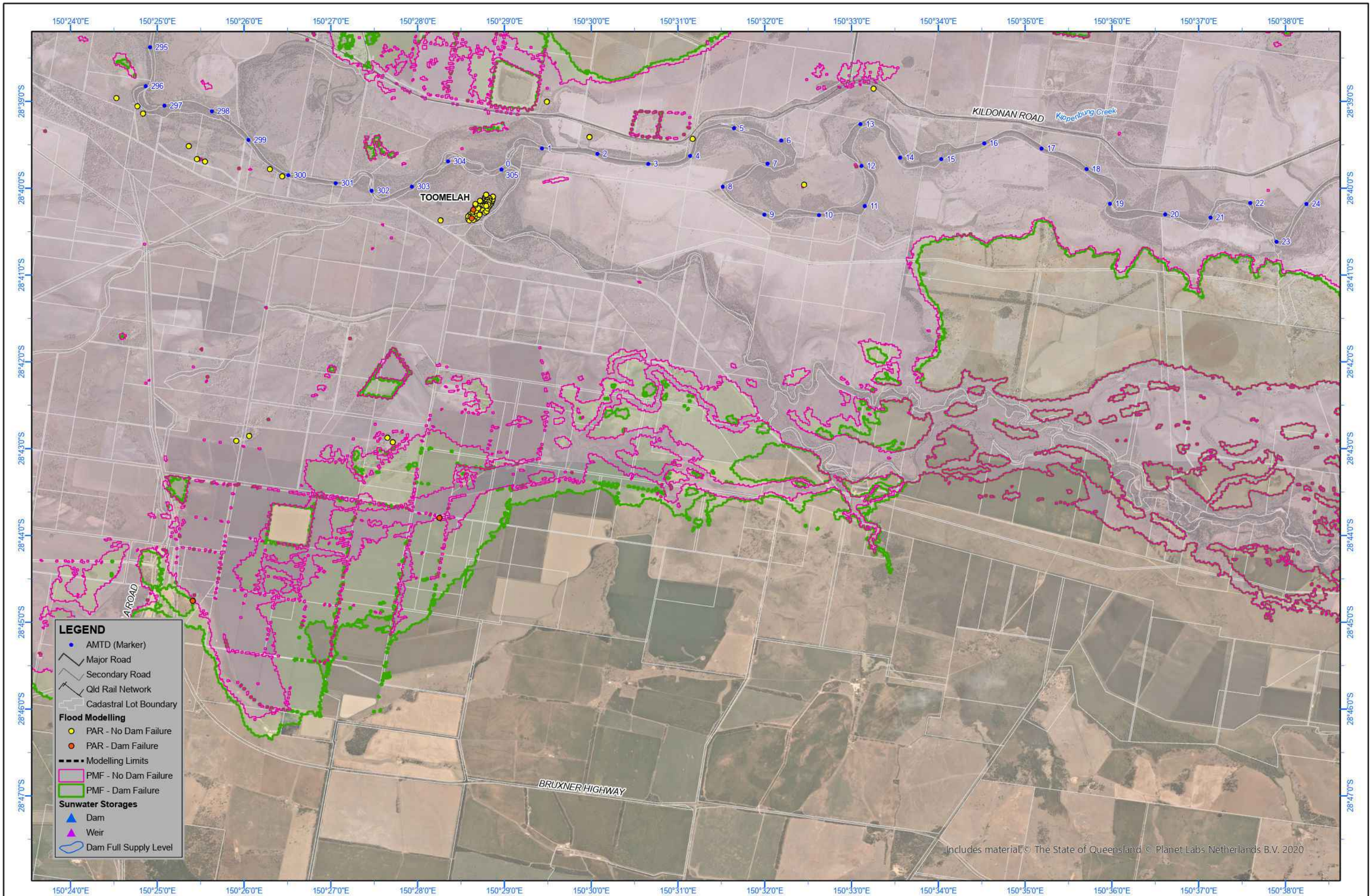

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027 | REV. C
SHEET 10 OF 37
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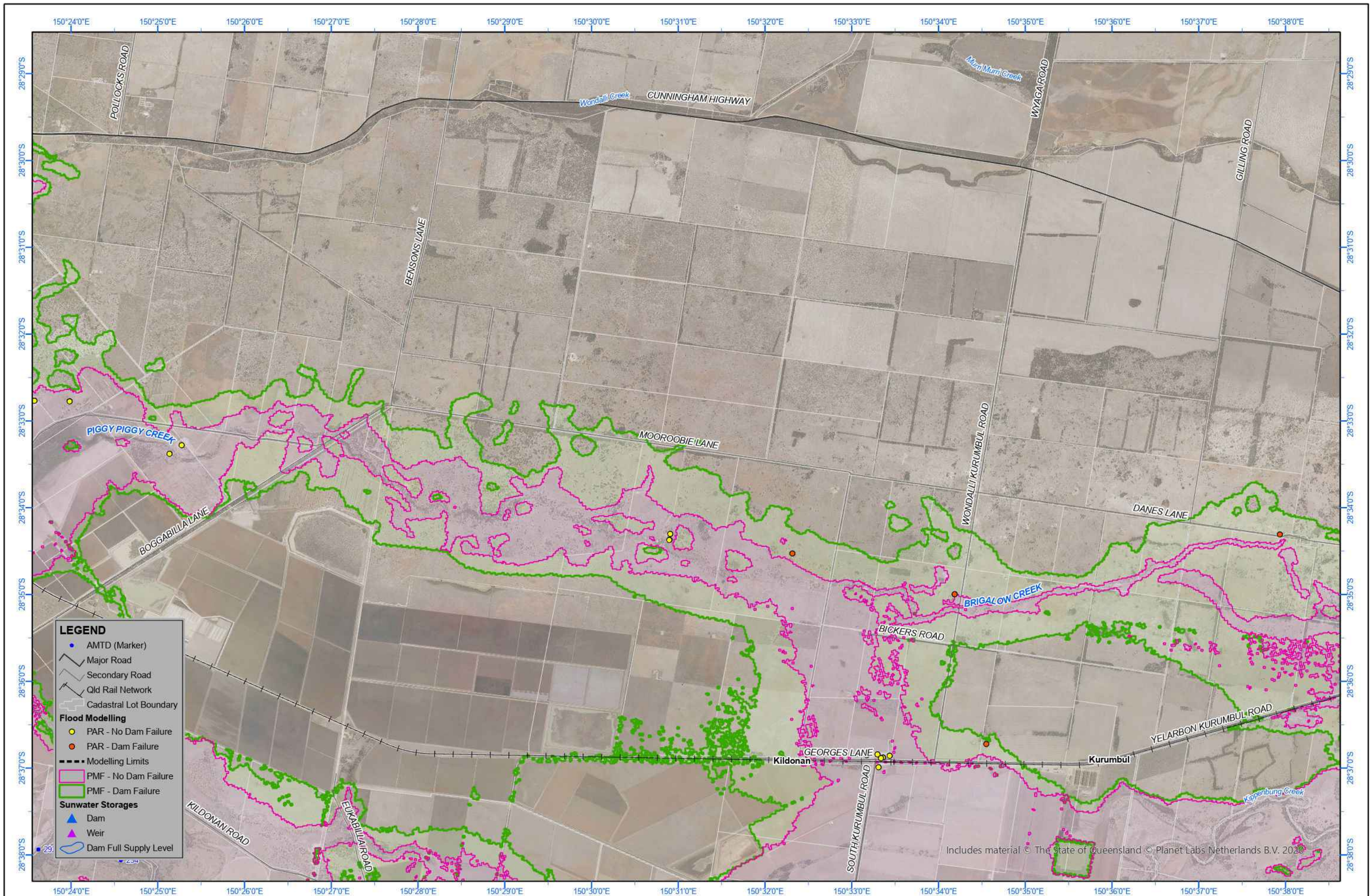

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14/12/2018
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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 11 OF 37
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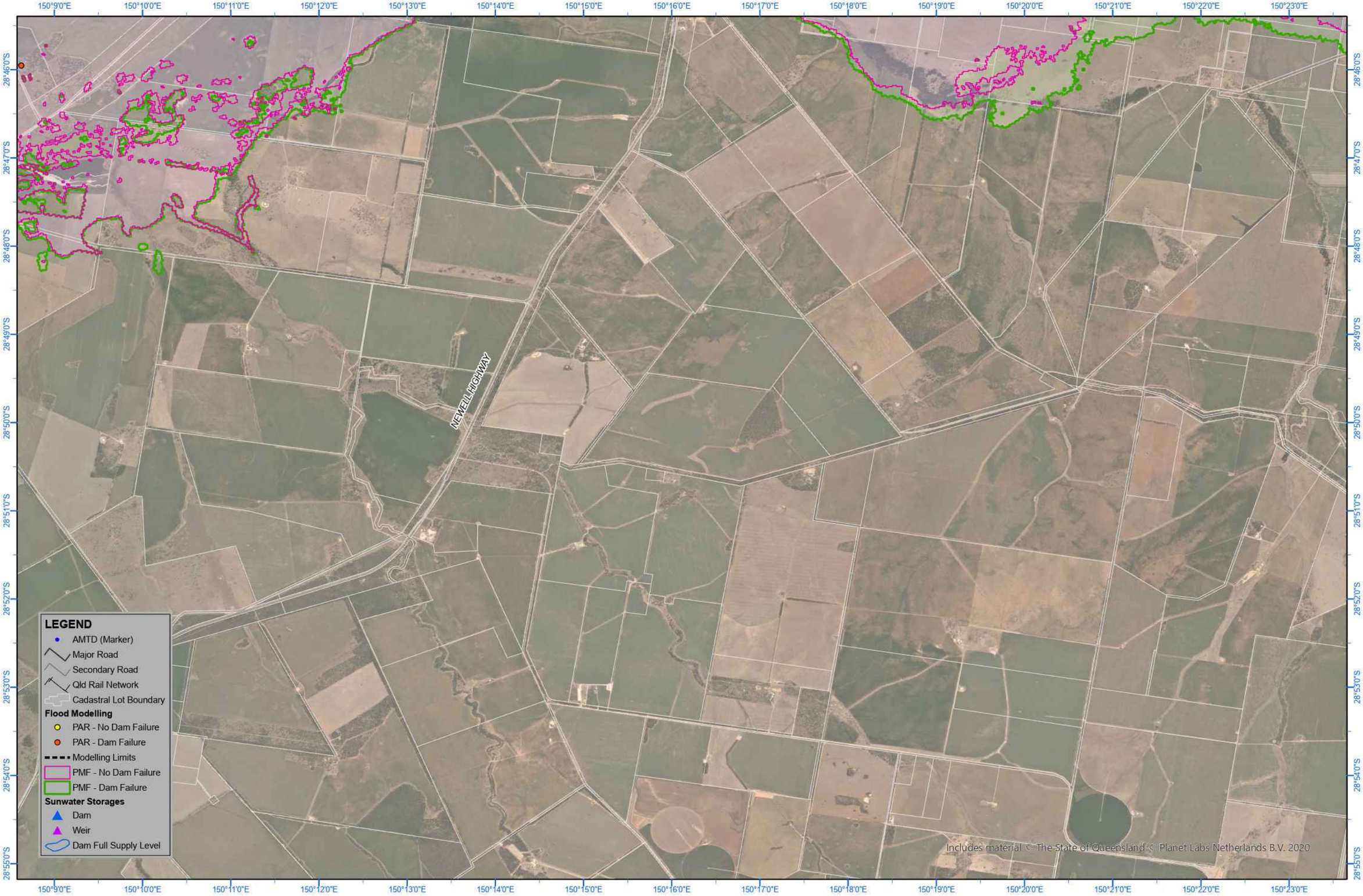

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IDH	
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	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250027 | REV. C

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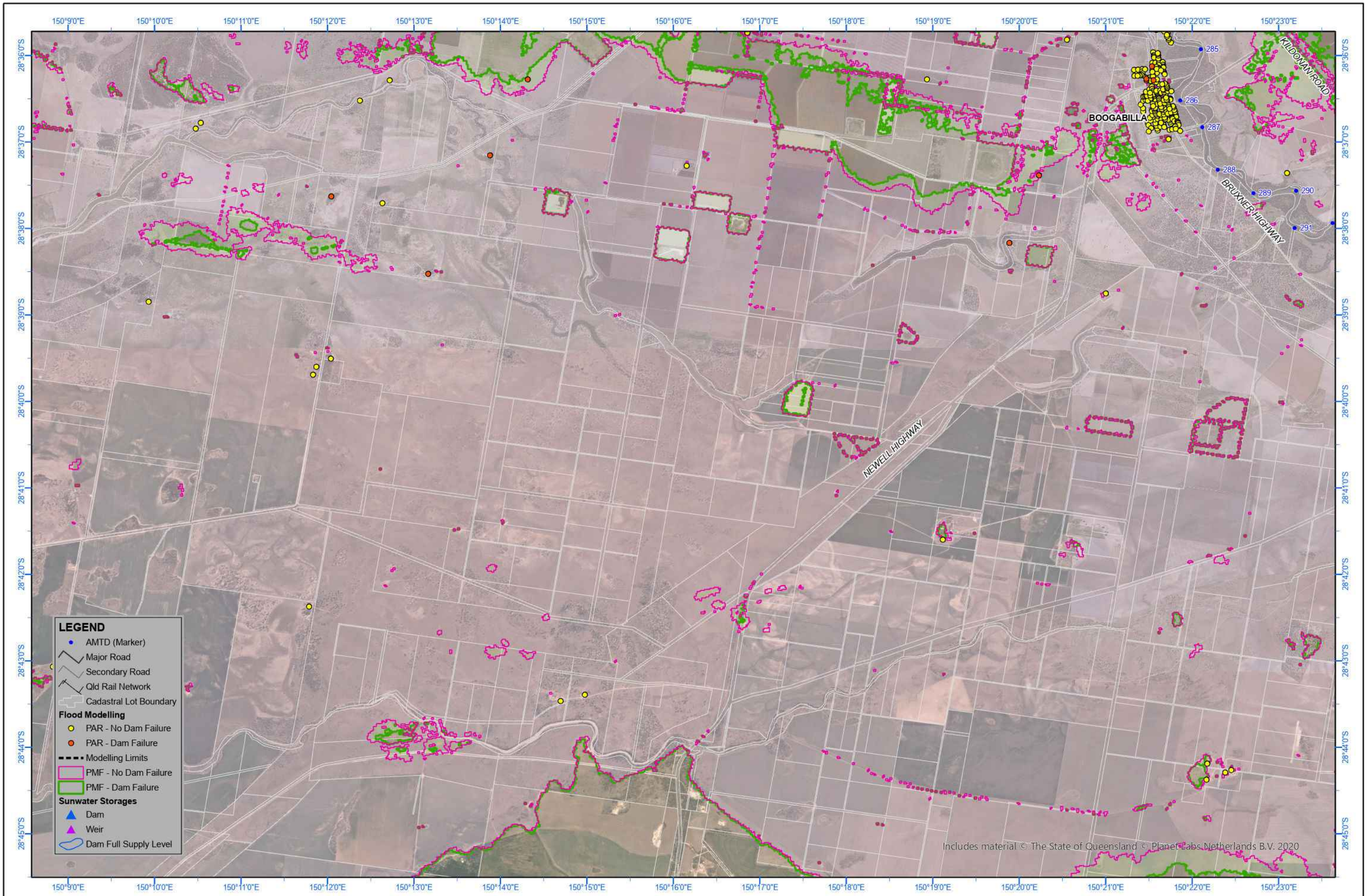

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027
REV. C
SHEET 13 OF 37
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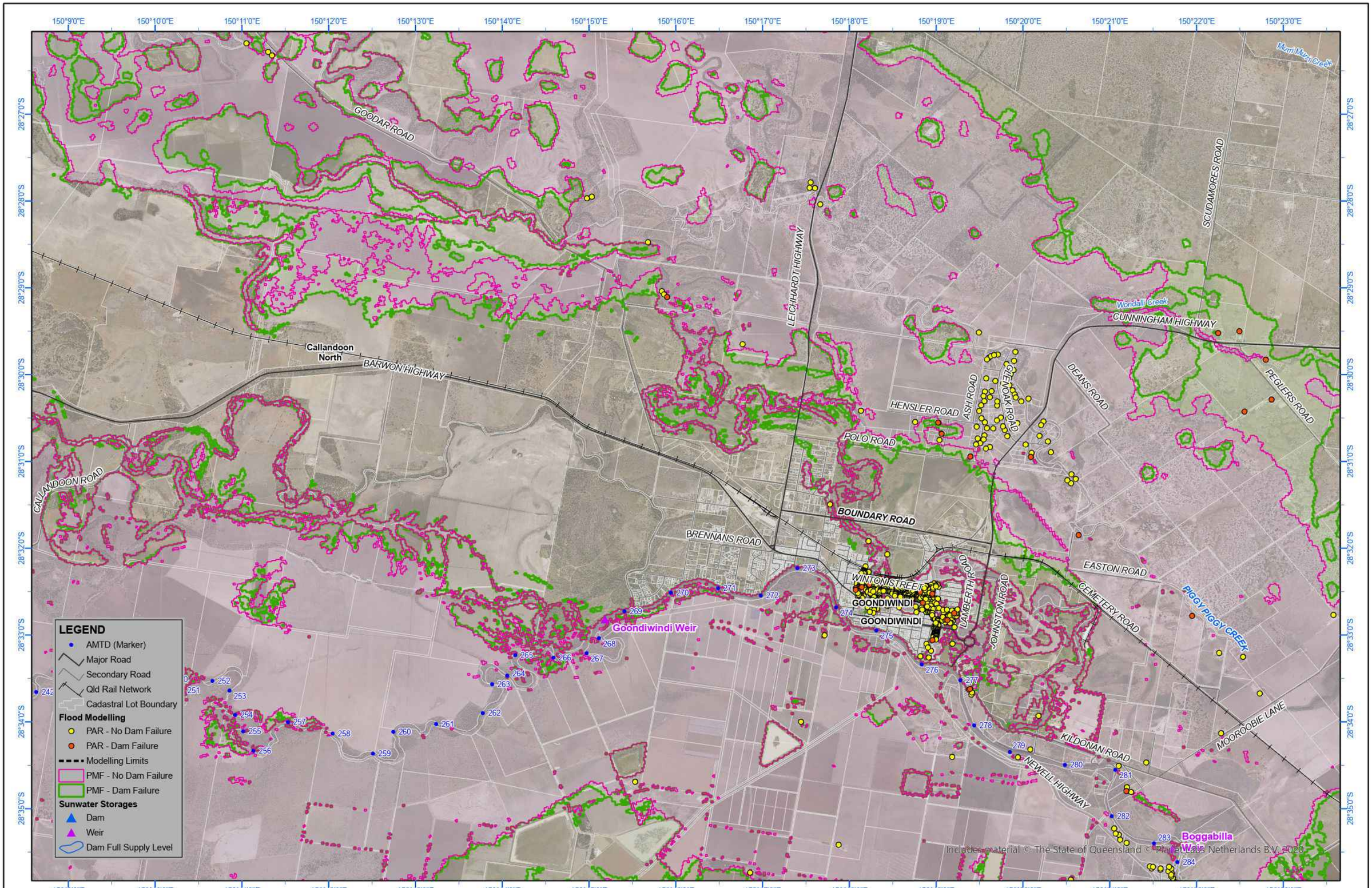

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IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

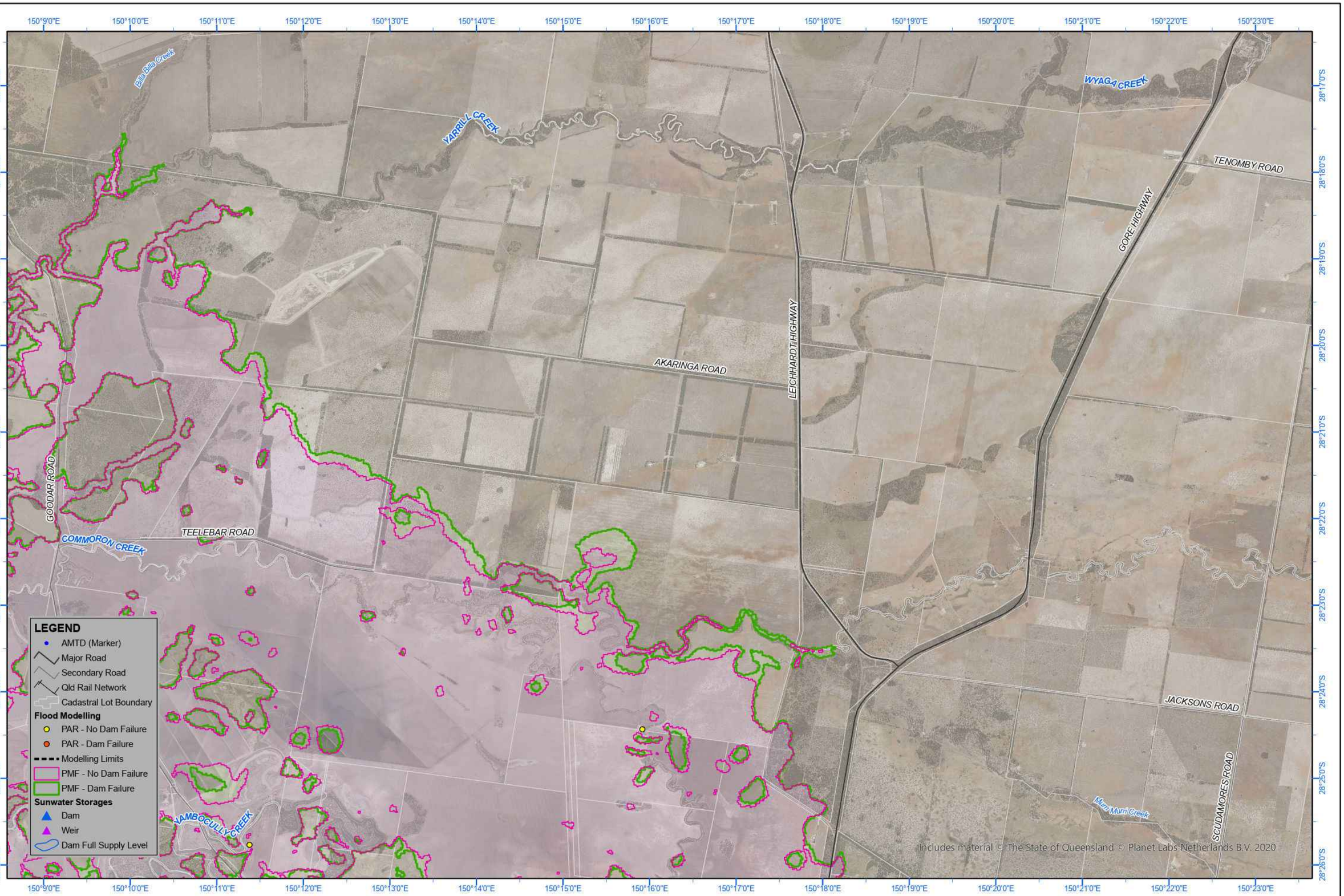
GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250027 | REV. C

SHEET 14 OF 37

DATE JUNE 2023



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IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027
REV. C
SHEET 15 OF 37
DATE JUNE 2023

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
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Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023

Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°54'0"E 149°55'0"E 149°56'0"E 149°57'0"E 149°58'0"E 149°59'0"E 150°0'0"E 150°1'0"E 150°2'0"E 150°3'0"E 150°4'0"E 150°5'0"E 150°6'0"E 150°7'0"E 150°8'0"E

28°46'0"S 28°47'0"S 28°48'0"S 28°49'0"S 28°50'0"S 28°51'0"S 28°52'0"S 28°53'0"S 28°54'0"S 28°55'0"S

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling

- PAR - No Dam Failure
- PAR - Dam Failure
- Modelling Limits
- PMF - No Dam Failure
- PMF - Dam Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

NEWELL HIGHWAY

REVISION					
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
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250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
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DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH
APPROVED	
M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
250027	C

SHEET 16 OF 37

DATE JUNE 2023

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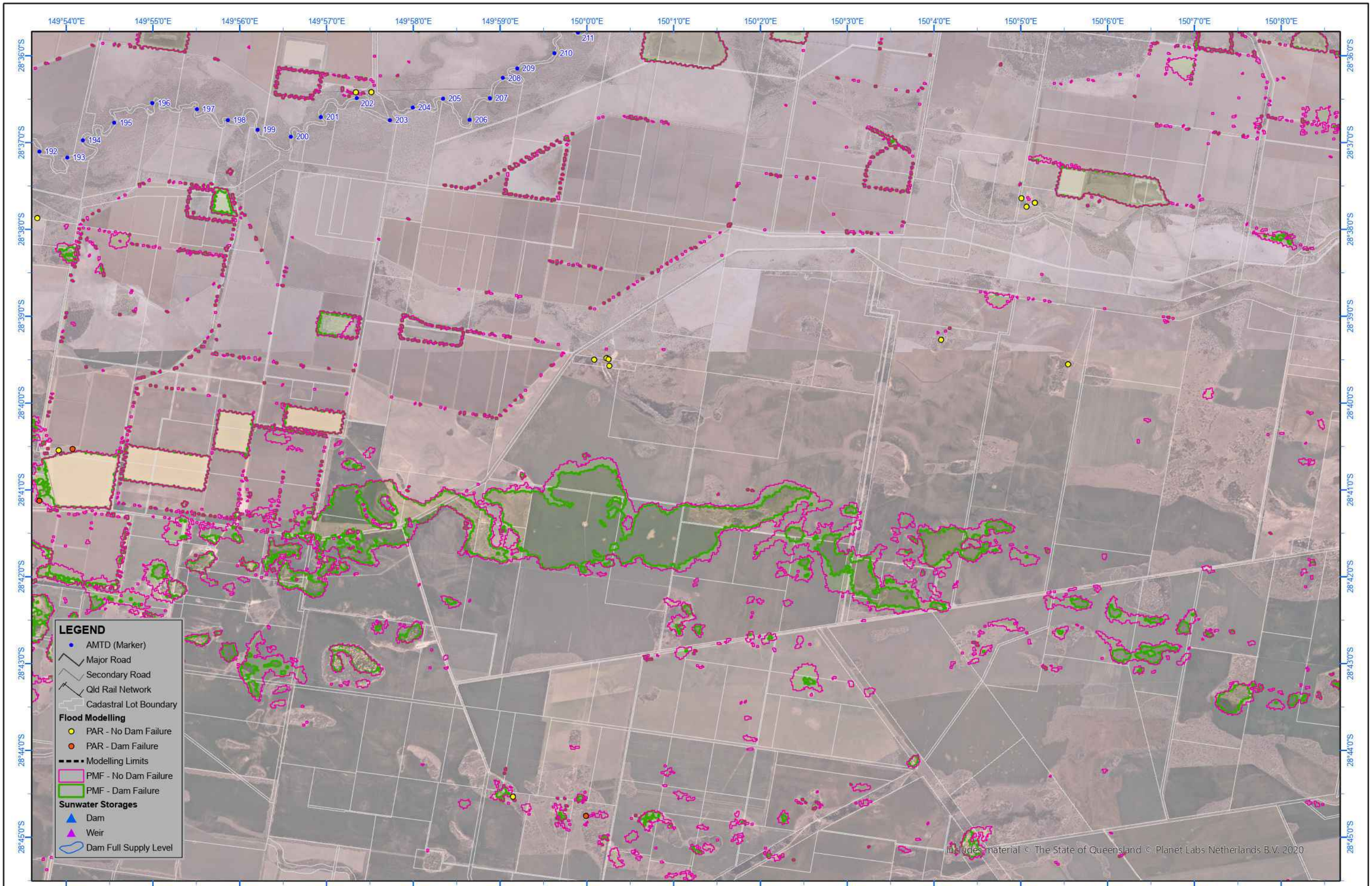

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14/12/2018
RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER	REV.
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SHEET 17 OF 37
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GOORAY ROAD
Gooray
Booberanna Creek
BARWON HIGHWAY
SOUTH WINTON ROAD
Beryl Watercourse
Callandoon Branch
CALLANDOON BRANCH
CALLANDOON ROAD

LEGEND
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211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241

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INUNDATION PLAN

CONTRACT NUMBER
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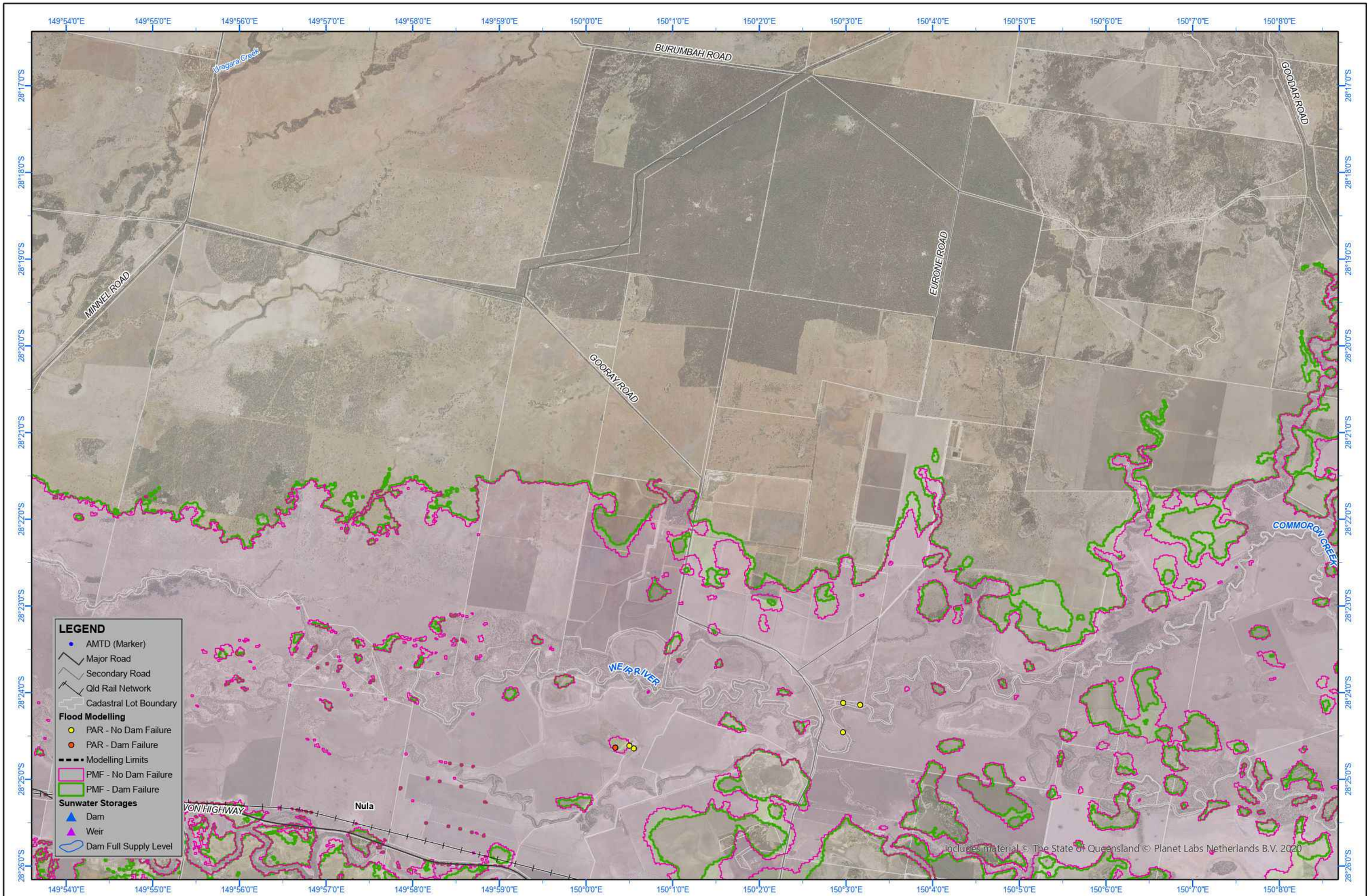

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GLENLYON DAM
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PROBABLE MAXIMUM FLOOD
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APPROVED: M.G. HUGHES 14/12/2018 RPEQ: 18351

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
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CONTRACT NUMBER
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SHEET 20 OF 37
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REVISION					
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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
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SHEET 21 OF 37

DATE JUNE 2023

MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
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Map Produced By:
Water Resources and Dam Safety
Tel: (07) 3120 0000

149°39'0"E 149°40'0"E 149°41'0"E 149°42'0"E 149°43'0"E 149°44'0"E 149°45'0"E 149°46'0"E 149°47'0"E 149°48'0"E 149°49'0"E 149°50'0"E 149°51'0"E 149°52'0"E 149°53'0"E

28°27'0"S 28°28'0"S 28°29'0"S 28°30'0"S 28°31'0"S 28°32'0"S 28°33'0"S 28°34'0"S 28°35'0"S

Welltown
BARWON HIGHWAY
Yarrilwarra Creek
SOUTH TOOBEAH ROAD
Booberanna Creek
SOUTH WELLTOWN ROAD
Kiddy Gear al Creek
CALLANDOON BRANCH
DONOVANS ROAD
JAMIESONS ROAD

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling
- PAR - No Dam Failure
- PAR - Dam Failure
- Modelling Limits
- PMF - No Dam Failure
- PMF - Dam Failure

Sunwater Storages
- Dam
- Weir
- Dam Full Supply Level

REVISION					
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH	
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH	
14/12/18	A	ISSUED FOR USE	IDH	MGH	
DATE		REMARKS	CKD	PSD	

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH	DESIGNED
CHECKED	CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018	RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027
REV. C
SHEET 22 OF 37
DATE JUNE 2023

Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
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28°17'0"S 28°18'0"S 28°19'0"S 28°20'0"S 28°21'0"S 28°22'0"S 28°23'0"S 28°24'0"S 28°25'0"S 28°26'0"S

GLENGOWER ROAD
TALWOOD MEANDARRA ROAD
MEANDARRA TALWOOD ROAD
KIOMA ROAD
MINNEL ROAD
BARWON HIGHWAY
IGHWAY
TOOBEAH
Boogara Creek
Minnel Creek
Uragara Creek
WEIR RIVER

LEGEND
- AMTD (Marker)
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APPROVED	M.G. HUGHES 14/12/2018
RPEQ: 18351	

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027
REV. C
SHEET 23 OF 37
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28°56'0"S 28°57'0"S 28°58'0"S 28°59'0"S 29°0'0"S 29°10'0"S 29°20'0"S 29°30'0"S 29°40'0"S

LEGEND

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Flood Modelling

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250027 | REV. C

SHEET 24 OF 37

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BOOMI CALOONA ROAD

LEGEND

- AMTD (Marker)
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- Secondary Road
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Flood Modelling

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
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SHEET 25 OF 37
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28°36'0"S 28°37'0"S 28°38'0"S 28°39'0"S 28°40'0"S 28°41'0"S 28°42'0"S 28°43'0"S 28°44'0"S 28°45'0"S

96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 138 139 140 141 142

WEIR RIVER

BOOMI CALOONA ROAD

BOOMI

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
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	MGH

APPROVED
M.G. HUGHES
14/12/2018
RPEQ: 18351

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

DRAWING NUMBER 250027 | REV. C

SHEET 26 OF 37

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28°27'0"S 28°28'0"S 28°29'0"S 28°30'0"S 28°31'0"S 28°32'0"S 28°33'0"S 28°34'0"S 28°35'0"S

NORTH TALWOOD ROAD
BARWON HIGHWAY
TALWOOD
Lalaguli
WEIR RIVER
TALWOOD BOONANGA ROAD
MUNGINDI ROAD
GRADNA CREEK
Redbank Creek
Bombyarra Creek
Yarriwanna Creek
Booberanna Creek
Momonga Creek
Weir River

112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 140 141

LEGEND
- AMTD (Marker)
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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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CONTRACT NUMBER

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NORTH GRADNA ROAD
BUNGUNYA ALTON ROAD
Boogara Creek
NORTH TALWOOD ROAD
Windamall Creek
WEIR RIVER
Bombyanna Creek
Redbank Creek
BARWON HIGHWAY

LEGEND
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sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027 | REV. C
SHEET 28 OF 37
DATE JUNE 2023

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149°9'0"E 149°10'0"E 149°11'0"E 149°12'0"E 149°13'0"E 149°14'0"E 149°15'0"E 149°16'0"E 149°17'0"E 149°18'0"E 149°19'0"E 149°20'0"E 149°21'0"E 149°22'0"E 149°23'0"E

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LEGEND

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M.G. HUGHES 14/12/2018	RPEQ: 18351

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

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SHEET 29 OF 37

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER

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SHEET 30 OF 37

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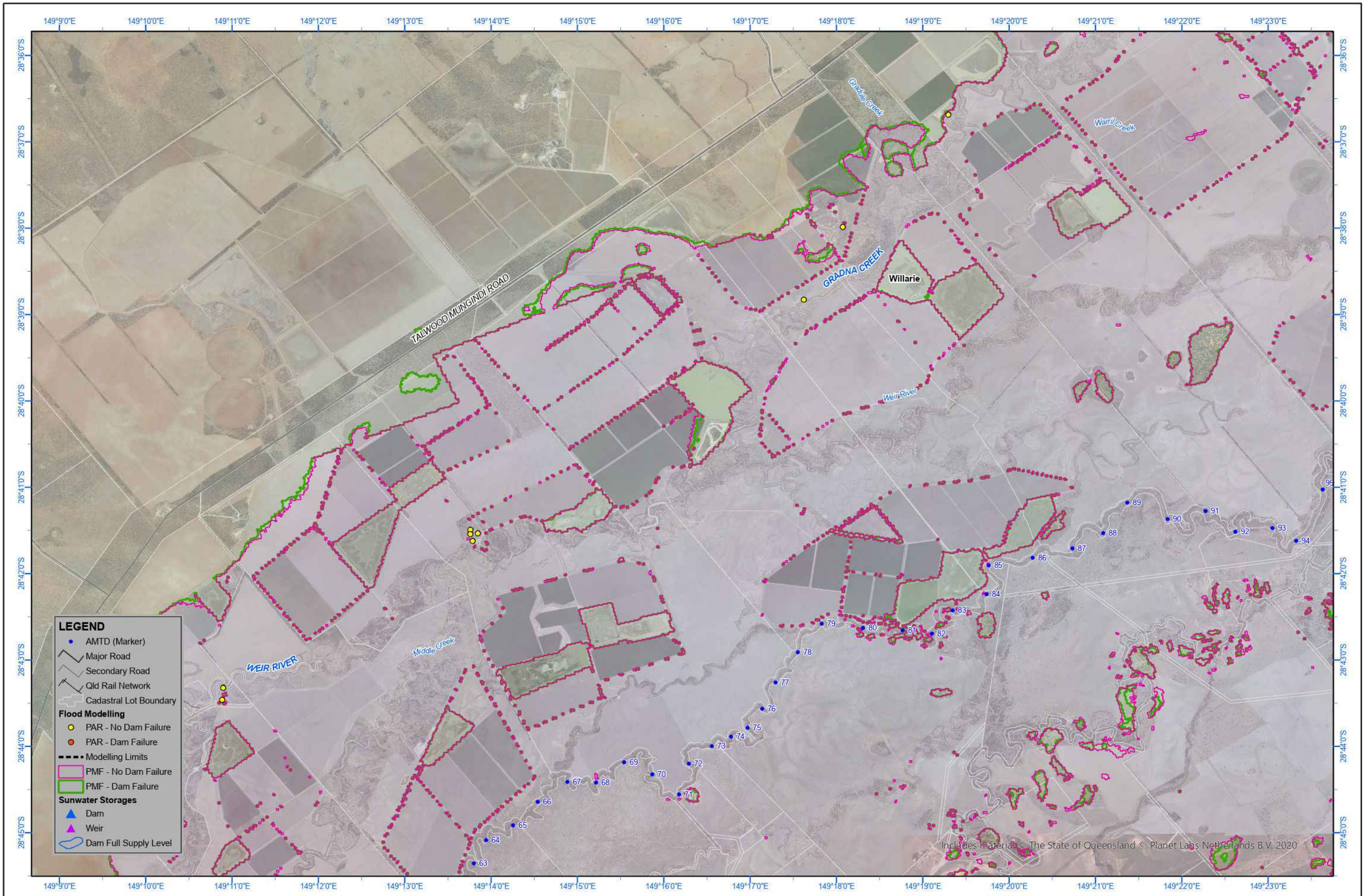

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ACN 131 034 985

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
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CONTRACT NUMBER
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WANDIBINDLE ROAD
FEAS ROAD
MCNAULTY ROAD
BARWON HIGHWAY
ARALUEN ROAD
NORTH GRADNA ROAD
Middle Creek
Gurardera Creek
Gurrinbry Creek
Gradule
SOUTH GRADULE ROAD
Gradule Creek
TALWOOD MUNGINDI ROAD
GRADNA CREEK
Warrandine Creek

LEGEND
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29°5'0"S 29°6'0"S 29°7'0"S 29°8'0"S 29°9'0"S 29°10'0"S 29°11'0"S 29°12'0"S 29°13'0"S 29°14'0"S

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Document: S:\BW_WaterResources\GIS_Data\SW_Border Rivers Commision\GlenlyonDam_EAP2022\Drawings\ArcMap\250027-C.pagx
Printed: 6 July 2023

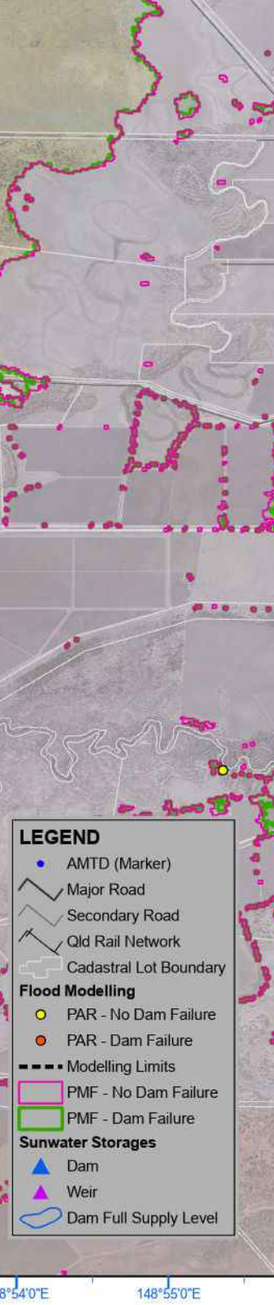
MAP PRODUCED BY:
WATER RESOURCES AND DAM SAFETY
TEL: (07) 3120 0000

148°54'0"E 148°55'0"E 148°56'0"E 148°57'0"E 148°58'0"E 148°59'0"E 149°0'0"E 149°1'0"E 149°2'0"E 149°3'0"E 149°4'0"E 149°5'0"E 149°6'0"E 149°7'0"E 149°8'0"E

28°56'0"S 28°57'0"S 28°58'0"S 28°59'0"S 29°0'0"S 29°1'0"S 29°2'0"S 29°3'0"S 29°4'0"S

Little Weir River
LITTLE WEIR RIVER
CARNARVON HIGHWAY
WEIR ROAD
BELMORE ROAD
GUNNINDADDY ROAD
MUNGINDI
Mungindi Weir
MUNGINDI

0 1 2 3 4 5 6 8 9 10 11 12 13 14 15 16 17 18 19 20



REVISION				
06/07/23	C	UPDATED PAR LAYER TITLE	LH	MGH
25/10/22	B	UPDATED TO 2022 FORMAT	LH	MGH
14/12/18	A	ISSUED FOR USE	IDH	MGH
DATE		REMARKS	CKD	PSD

MAP INFORMATION
Coordinate System: Geocentric Datum of Australia (GDA2020).

REFERENCE DRAWINGS
250024 - Keymap

SCALES (A3 SIZE)
0 750 1,500 2,250 3,000 3,750 m
1:75,000

DRAWN IDH | DESIGNED
CHECKED | CHECKED MGH
APPROVED M.G. HUGHES 14/12/2018 RPEQ: 18351

sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027 | REV. C
SHEET 34 OF 37
DATE JUNE 2023

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148°54'0"E 148°55'0"E 148°56'0"E 148°57'0"E 148°58'0"E 148°59'0"E 149°0'0"E 149°1'0"E 149°2'0"E 149°3'0"E 149°4'0"E 149°5'0"E 149°6'0"E 149°7'0"E 149°8'0"E

28°46'0"S 28°47'0"S 28°48'0"S 28°49'0"S 28°50'0"S 28°51'0"S 28°52'0"S 28°53'0"S 28°54'0"S 28°55'0"S

CARNARVON HIGHWAY

TALWOOD MUNGINDI ROAD

WEIR RIVER

LITTLE WEIR RIVER

47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20

LEGEND

- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

Flood Modelling

- PAR - No Dam Failure
- PAR - Dam Failure
- Modelling Limits
- PMF - No Dam Failure
- PMF - Dam Failure

Sunwater Storages

- Dam
- Weir
- Dam Full Supply Level

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CONTRACT NUMBER
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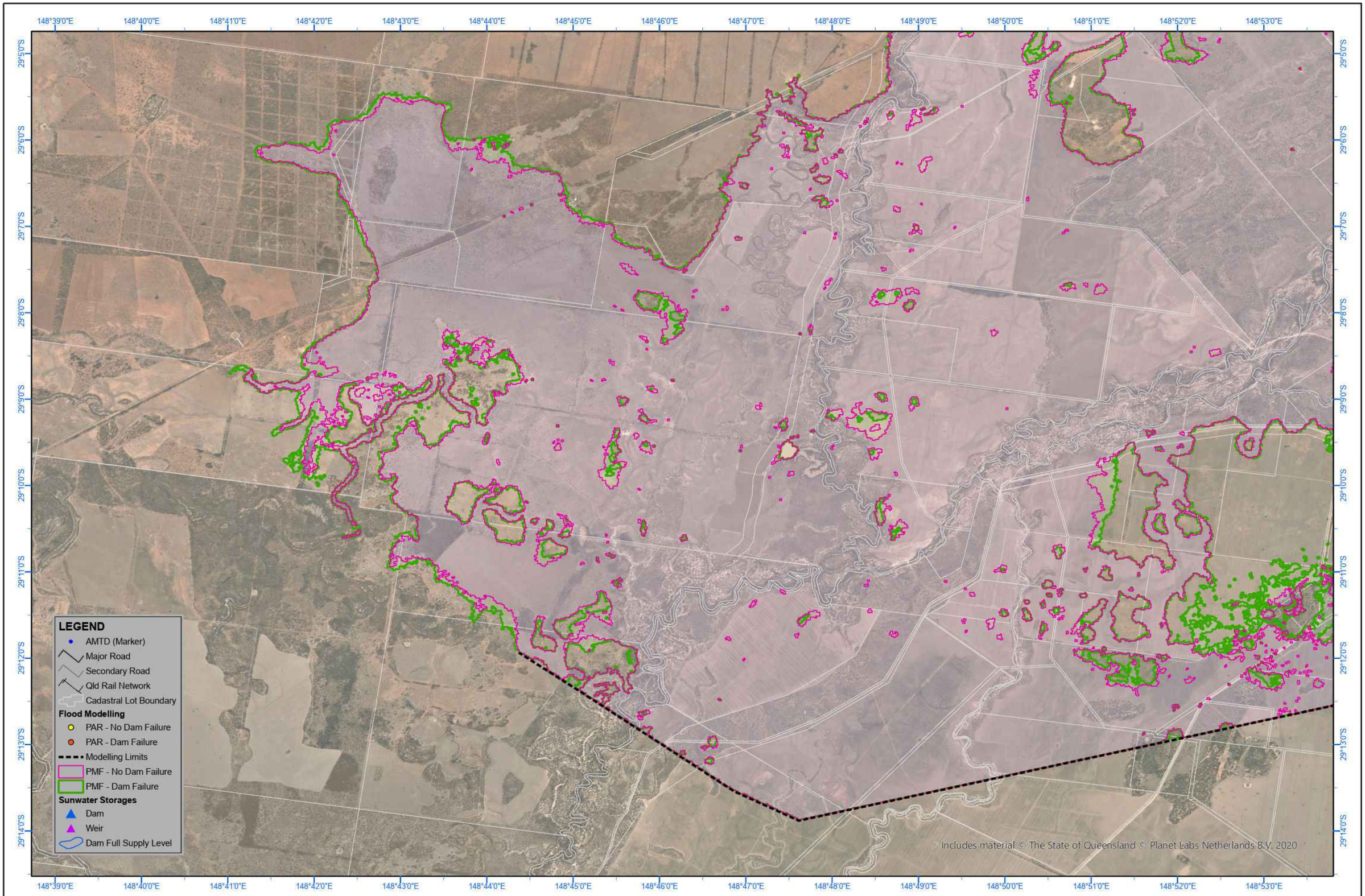

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DRAWN	DESIGNED
IDH	
CHECKED	CHECKED
	MGH

APPROVED
M.G. HUGHES
14/12/2018
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sunwater

GLENLYON DAM
DAM BREAK ANALYSIS 2017
PROBABLE MAXIMUM FLOOD
MAIN EMBANKMENT
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CONTRACT NUMBER

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SHEET 36 OF 37

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Printed: 6 July 2023

MAP PRODUCED BY:
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148°39'0"E 148°40'0"E 148°41'0"E 148°42'0"E 148°43'0"E 148°44'0"E 148°45'0"E 148°46'0"E 148°47'0"E 148°48'0"E 148°49'0"E 148°50'0"E 148°51'0"E 148°52'0"E 148°53'0"E

29°0'0"S 29°1'0"S 29°2'0"S 29°3'0"S 29°4'0"S

MOONIE RIVER
Ballandoon Creek
DINGADEE ROAD
GUNNINDADDY ROAD
LITTLE WEIR RIVER

LEGEND
- AMTD (Marker)
- Major Road
- Secondary Road
- Qld Rail Network
- Cadastral Lot Boundary

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GLENLYON DAM
DAM BREAK ANALYSIS 2017
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MAIN EMBANKMENT
INUNDATION PLAN

CONTRACT NUMBER
DRAWING NUMBER 250027 | REV. C
SHEET 37 OF 37
DATE JUNE 2023

LEGEND

- CATCHMENT BOUNDARY
- SUB CATCHMENT BOUNDARY
- CREEKS
- GAUGE STATION
- RAINFALL STATION
- 2 SUB AREA NUMBER

NOTES

1. Digital Cadastral Database(DCDB) current at March 2007
2. Projection: MGA 94 Zone 56
3. Levels Datum: Australian Height Datum (AHD)
4. FSL 411.73m AHD.

0 2 4 6 8 10 Kilometers

1:200,000

DRAWN	DESIGNED
JJN	
CHECKED	CHECKED
APPROVED	
TAM 28.08.2007	

SunWater
Level 9, 120 Edward Street
Brisbane Qld 4002
Tel: (07) 3120 0000

PIKE CREEK
GLENLYON DAM AMTD 6.6km
DESIGN FLOOD HYDROLOGY
CATCHMENT MAP AND URBS MODEL

MAP NUMBER 229599

DATE AUG 2007

Document: Q:\GIS\Glenlyon Dam\Maps\229599.mxd
Printed: Wednesday, August 22 2007 09:03:18 AM

APPENDIX C Equipment and technical information

C1 List of equipment available during an emergency

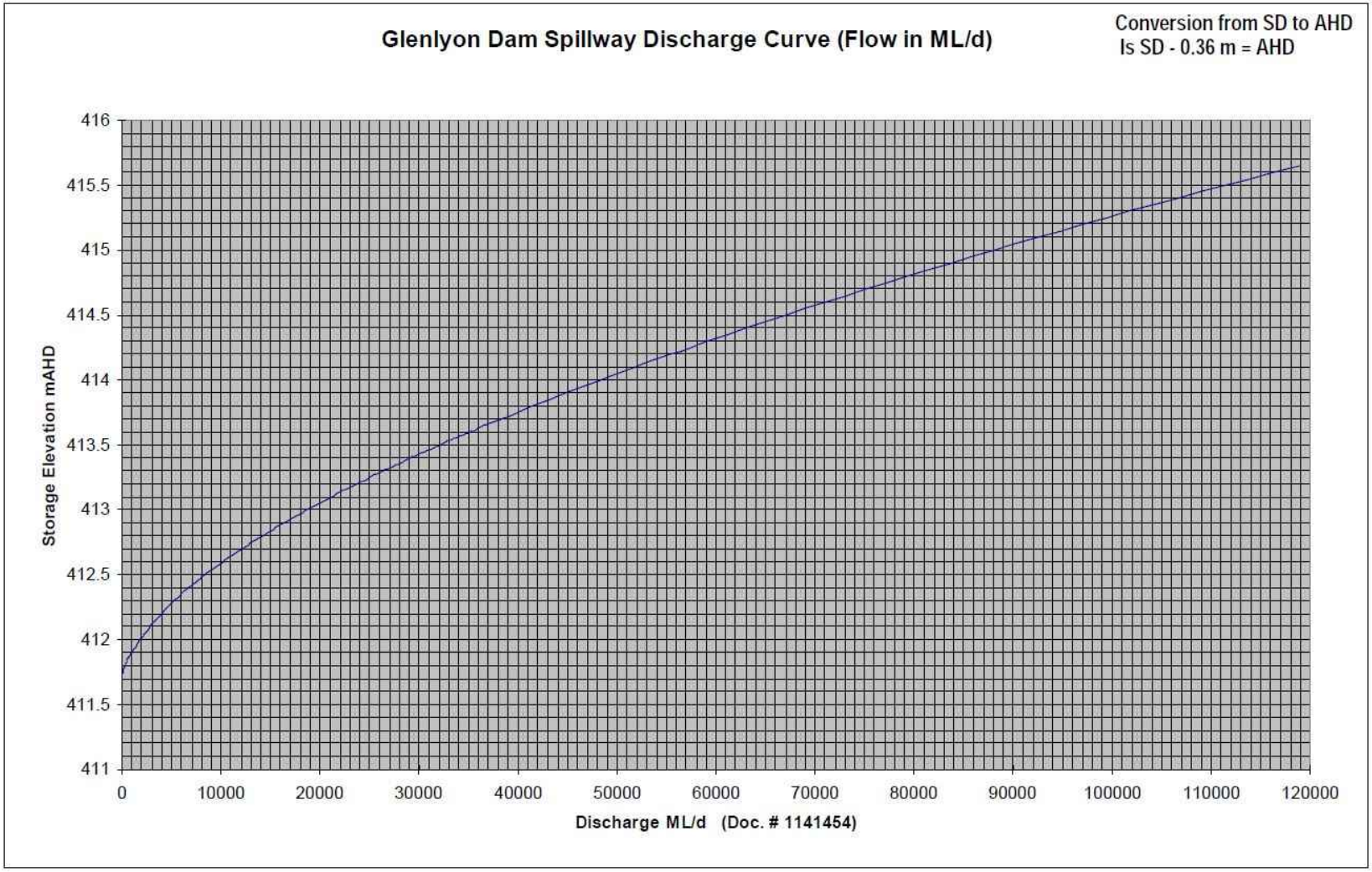
C2 Glenlyon Dam spillway discharge

C3 Glenlyon Dam storage curve

Appendix C1 has been redacted

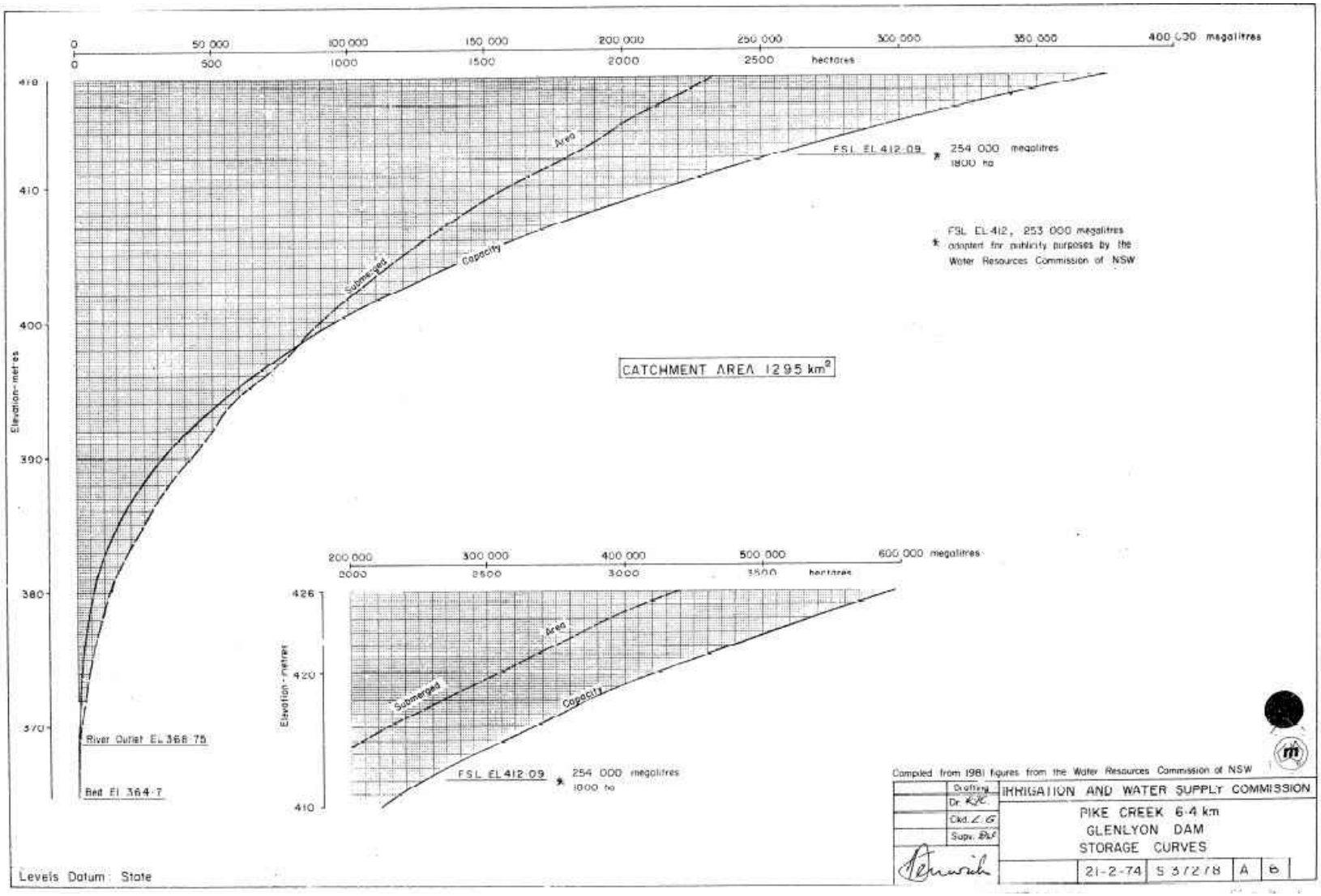
Appendix C2: Glenlyon Dam spillway discharge

Figure C1: Glenlyon dam spillway discharge



Appendix C3: Glenlyon Dam storage curve

Figure C2: Glenlyon dam storage curve



Appendix D Interaction with local government and district groups

To be populated when EAP next completes a substantive review

Annexe — Glenlyon Dam 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. Glenlyon Dam is spilling excess water into Pike Creek. People downstream of Glenlyon Dam should STAY INFORMED and MONITOR CONDITIONS. Water flows from Glenlyon Dam 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 immediate danger. More information here: bit.ly/RecandSafety	FLOOD WATCH AND ACT from Sunwater. Excess water spilling from Glenlyon Dam into Pike Creek has increased significantly. Water flows from Glenlyon Dam may contribute to dangerous/widespread flooding downstream. Expect increased river flows in 6-12 hours / later today/ overnight/ tomorrow. People downstream of Glenlyon Dam 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: bit.ly/RecandSafety	FLOOD EMERGENCY WARNING from Sunwater: People downstream of Glenlyon Dam including the Dumaresq Valley and Bonshaw must LEAVE IMMEDIATELY. Glenlyon Dam possible failure/is failing. Major flooding is happening now. Your life is at risk. Go now to a safe place away from the flood. Tenterfield and Moree are safe. More information here: Southern Downs Regional Council disaster.sdrc.qld.gov.au and Goondiwindi Regional Council dashboard.grc.qld.gov.au