CORELLA DAM

Emergency Action Plan
Technical Services
September 2023

Prepared by:
Technical Services
Department of Resources
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PREPARATION AND AUTHORISATION

Queensland Government

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

Emergency Event – Activation Quick Guide

This Emergency Action Plan (EAP) for the Corella Dam covers five emergency conditions. Use the following table to select the relevant section of the EAP that deals with the emergency condition.

Table 1 – Emergency Event Activation Quick Guide

Activation Level	Normal Spillway Discharges SOP 14	Alert	Lean Forward	Stand Up		Stand Down
Decision Authority	EEC	EEC	EEM and DM	EEM and DM		EEM and DM
Activation triggers for emergency conditions relating to uncontrolled dam release hazards, including downstream release hazards (Flooding)						
Flooding (Section 5.1)	Reservoir water level (FSL) above EL 297.6m	Reservoir water level above EL 299m (and rising) and overflowing depth of 1.4m in main spillway.	Reservoir water level above EL 299.5m (and rising) and overflow commencing in auxiliary spillway.	Reservoir water level above EL 301.0m (Historical maximum) and rising.		Reservoir water level below EL 299.0m and falling (and no more risk of damage from downstream release hazards to persons or property)
Activation triggers for emergency conditions relating to dam failure hazards						
Structural (Section 5.2)	Not applicable	Increasing seepage through an embankment, the foundations or an abutment	Increasing seepage through an embankment, the foundations or an abutment with cloudy water	Structural condition has been established and failure in progress or likely		Risk assessment has determined that failure risk has reduced
Chemical/Toxic Spill (Section 5.3)	Not applicable	Reports of contamination or potential contamination in the catchment area of the storage and/or potential downstream release hazards to RDSWU	Reports of contamination or potential contamination in the catchment area of the storage and/or potential downstream release hazards (to persons and/or property)	Confirmation of or high probability of a large amount of Chemical/Toxic Spill condition found in the catchment		Risk assessment that risk has reduced or no longer exists. Confirmation that significant contamination has **not** occurred All clear water quality test result.
Terrorist Threat/Activity or High Energy Impact (Section 5.4)	Not applicable	Not applicable	Not applicable	Possible terrorist activity noticed at the 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		Risk assessment has determined that failure risk has reduced.
Earthquake (Section 5.5)	Not applicable	Earthquake reported or felt in the area **AND** Intensity <u>less than</u> or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Intensity <u>greater than</u> or equal to 5MM **AND** Change detected during surveillance	**Stand Up 1** Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	**Stand Up 2** Failure possible or in progress due to earthquake	Risk assessment has determined that failure risk has reduced

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EAP DISTRIBUTION LIST

Control Copy Number	Position	Title/Business Unit	Location
1	Dam Inspection Officer	RoadTek	Cloncurry
2	Dam Inspection Officer (Backup 1)	RoadTek	Cloncurry
3	Dam Inspection Officer (Backup 2)	RoadTek	Cloncurry
4	Emergency Event Coordinator	TS, DoR	Brisbane
5	Emergency Event Manager	TS, DoR	Rockhampton
6	Director, Asset Management	TS, DoR	Brisbane
7	Executive Director	TS, DoR	Brisbane
8	Deputy Director-General	Georesources DoR	Brisbane
9	Director General	DoR	Brisbane
10	Director Dam Safety	DRDMW	Brisbane
11	Chairperson, LDMG	Mayor, CSC	Cloncurry
12	Local Disaster Coordinator, LDMG	CEO, CSC	Cloncurry
13	Dam Inspection Officer	RoadTek	Cloncurry
14	Dam Inspection Officer (backup)	RoadTek	Cloncurry
15	Executive Officer, DDMG	Senior Sergeant, QPS	Mount Isa
16	District Disaster Coordinator, DDMG	Superintendent, QPS	Mount Isa
17	Police (in an emergency 000)	Officer In Charge, QPS	Cloncurry
18	Office of the Commissioner	QFES	Brisbane
19	Assistant Commissioner	Northern Region, QFES	Townsville
20	State Disaster Coordination Centre	Watch Desk Officer	Brisbane
21	Emergency Event Coordinator (Backup 1)	TS, DoR	Rockhampton
22	Emergency Event Coordinator (Backup 2)	TS, DoR	Rockhampton

ENDORSEMENT SHEET

This Emergency Action Plan was prepared by Technical Services (TS) officers in liaison with Cloncurry Shire Local Disaster Management Group (LDMG).

Preparation

Name (Print Name):

Position: Senior Engineer, Technical Services

Signed: Date: 27 / 09 / 2023

Reviewed

Name (Print Name):

Position: Central Operations Manager, Technical Services

Signed: Date: ___/___/_____

Endorsed:

Name (Print Name):

Position: Director Asset Management, Technical Services

Signed: Date: ___/___/_____

DOCUMENT REVISION HISTORY

Revision No.	Date	Revision Description
0	20 February 2004	Original Issue
1	8 September 2004	Updated Notification Listing
2	18 February 2005	Updated Notification Listing
3	November 2005	EAP Update - November 2005
4	January 2007	EAP Update - January 2007
5	18 September 2007	Updated Notification Listing
6	March 2008	Contacts list updated and documentation revision
7	October 2009	Contacts list updated and documentation revision
8	October 2010	Contacts list updated and documentation revision
9	October 2011	Contacts list updated and documentation revision
10	October 2012	Flood Commission Recommendations and Departmental name change.
11	October 2013	Contact list updated and documentation revision for the new Dam Safety guidelines
12	October 2014	Contacts list updated
13	December 2015	Review and update of EAP undertaken by SMEC incorporating IGEM inclusions & Remote Sensing and Alert Systems.
14	September 2016	Review and update of EAP undertaken by NCA incorporating IGEM recommendations and Remote Sensing and Alert Systems.
15	September 2017	Review and update of EAP undertaken by NCA.
16	September 2018	Review and update of EAP by IM (DNRME)
17	September 2019	Review and update of EAP by TS (DNRME)
18	September 2020	Review and update of EAP by TS (DNRME), non-substantial changes only.
19	September 2021	Review and update of EAP by TS (DoR), non-substantial changes only.
20	September 2022	Review and update of EAP by TS (DoR). Substantive changes including earthquake activation triggers, corrected primary and auxiliary spillway levels, added Burke Development Rd inundation impacts.
21	September 2023	Contact lists and title of roles updated. Dam Inspection Engineer role added for consistency with portfolio. Corrected grammatical errors and applied minor amendments to wording and formatting for greater consistency and clarification of communication responsibilities.

LIST OF ACRONYMS

Acronym	Full Title	Description
AEP	Annual Exceedance Probability	Annual likelihood of an event occurring, i.e., 1 in X years
AHD	Australian Height Datum	Australian Height Datum, datum for the levels in this EAP.
AM	Asset Management	Staff of the Asset Management business unit of DoR
AMTD	Adopted Middle Thread Distance	The distance in kilometres, measured along the middle of a water course, that a specific point in the watercourse is from the watercourses mouth or junction with the main watercourse.
ANCOLD	Australian National Committee on Large Dams	National organisation providing guidelines on the operation and maintenance of dams.
BOM	Bureau of Meteorology	Government department providing weather data and weather warnings.
CEO	Chief Executive Officer	Chief Executive Officer of Cloncurry Shire Council.
CSC	Cloncurry Shire Council	Manages the response to an emergency event as the Local Disaster Management Group. Corella Dam located within Cloncurry Shire.
DCFF	Dam Crest Flood Failure	Failure of a dam with inflow from a flood that will reach and overtop the crest of the embankment by a small amount.
DCL	Dam Crest Level	The level (generally measured in AHD) of the crest of the dam embankment.
DDC	District Disaster Coordinator	The person nominated in the District Disaster Plan as the coordinator of responses in an emergency event.
DDGGeo	Deputy Director-General, Georesources	Deputy Director-General, Georesources, DoR
DDMG	District Disaster Management Group	Assist and enable local government to fulfil their functions under the *Disaster Management Act 2003 (The Act*).
DDS	Director Dam Safety	Director Dam Safety for DRDMW
DE	Dam Inspection Engineer	RPEQ Engineer responsible for undertaking special inspections as required.
DGDoR	Director-General	Director-General of DoR
DIO	Dam Inspection Officer	Person appointed by RoadTek to undertake inspections.

Acronym	Full Title	Description
DM	Director, Asset Management	Director responsible for Asset Management section of DoR
DoR	Department of Resources	Department representing Queensland Government who own Corella Dam.
DoREM	DoR Emergency Management	Emergency Management section of DoR.
DoRM	DoR Media	DoR Media section responsible for media releases.
DRDMW	Department of Regional Development, Manufacturing and Water	Department of Regional Development, Manufacturing and Water.
DTMR	Department of Transport and Main Roads	Department of Transport and Main Roads.
E	Email	Electronic method of notification.
EAP	Emergency Action Plan	The Emergency Action Plan for Corella Dam (this document)
Earthquake Intensity	Modified Mercali (MM) 5 or Magnitude Scale 5	An earthquake which is felt outdoors. Sleepers awakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing. Pictures move. Pendulum clocks stop.
EDTS	Executive Director, Technical Services	Executive Director, Technical Services, DoR
EEC	Emergency Event Coordinator	Person responsible for activating the EAP and coordinates emergency actions. An employee of Technical Services, DoR.
EER	Emergency Event Report	Document prepared by DIO or EEM and forwarded to DM and, once approved, sent to DDS. Document written only if required according to *Water Supply (Safety and Reliability) Act 2008.*
EEM	Emergency Event Manager, Technical Services	Emergency Event Manager responsible for management of the dam, DoR
EL	Elevation	Elevation above Mean Sea Level in AHD.
ERT	Emergency Response Team	Internal TS team which carries out EAP communications and actions.
FSL	Full Supply Level	Level reached for dam to spill
GDA	Geocentric Datum Australia	Datum for position (Latitudes and Longitudes).
GSDM	Generalised Short-Duration Method	The Generalised Short-Duration Method is appropriate for durations up to 6 hours, suitable for small catchments such as those of reservoirs and tailings dams anywhere in Australia.

Acronym	Full Title	Description
LDC	Local Disaster Coordinator	Person nominated in the Shire Disaster Plan as the coordinator of responses in an emergency event.
LDCC	Local Disaster Coordination Centre	Centre established in an emergency to manage the response to the emergency.
LDMG	Local Disaster Management Group	Management group established to manage the response to an emergency event.
m	Metres	Unit of distance
ML	Megalitres	Unit of measurement
P	Phone	Method of notification.
PAR	Population at Risk	Population exposed to danger as a result of the event leading to the emergency situation.
PMF	Possible Maximum Flood	Maximum flood level from the estimated largest possible event.
PMP	Possible Maximum Precipitation	Rainfall from the estimated largest possible event.
PMPDF	Probable Maximum Precipitation Dam Failure	Is the theoretical greatest depth of precipitation for a given duration that is, physically possible over a particular catchment area which fails the dam. It represents the largest flood failure for a given dam using reasonable parameters.
QFES	Queensland Fire and Emergency Services	Manages State Disaster Coordination Centre.
QPS	Queensland Police Service	Queensland Police Service.
RDSWU	Riparian Downstream Water Users	Landholders riparian to the river who use water downstream of the dam.
RPEQ	Registered Professional Engineer Queensland	Engineer with qualifications and experience registered to undertake engineering work in Queensland.
RSAS	Remote Sensing and Alert System	Electronic monitoring system that can be accessed remotely and provides alarms.
RWL	Reservoir Water Level	Water level in Corella Dam reservoir.
S	SMS	Method of notification
SDCC	State Disaster Coordination Centre	Coordinates the communications and actions at a State level during an event, as required.
SDF	Sunny Day Failure	Failure of a dam without an inflow from a flood. At Full Supply Level (FSL) or below.
SES	State Emergency Service	State Emergency Service.
SMS	Short Message Service	Service provided on mobile phones for sending messages.

Acronym	Full Title	Description
SOP	Standing Operating Procedure	Documented procedure for undertaking a defined activity.
SR	SitRep	Method of notification to the State Disaster Coordination Centre.
TS	Technical Services, DoR	Staff of Technical Services unit, Georesources, DoR.
QFES	Queensland Fire and Emergency Services	Manager State Disaster Coordination Centre
QPS	Queensland Police Service	Queensland Police Service
U7	UHF Radio Channel 7	Method of communication.
UHF	Ultra-High Frequency	A form of communication using radio waves sent usually by line of sight.

BUSINESS TERMS AND DEFINITIONS

The meanings of the terms used in this section are set out in accordance with relevant legislation, the Emergency Action Plan guideline and dam industry terminology.

Term	Definition
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. **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.
Chemical spill/toxic condition	The contamination of water in the storage of the dam that could create a dam hazard.

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
Dam Failure	Dam failure is the physical collapse of all or part of a dam or the uncontrolled release of any of its contents. 'Sunny day' dam failure is where the failure occurs at the full supply level and there is no concurrent rain associated flooding.
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.
Dam 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; a coordinated response, involving 2 or more of the following relevant entities, is required to respond to the event; the event may arise because of a disaster situation declared under the *Disaster Management Act 2003*; 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.
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 2003*.
District group (District Disaster Management Group)	For an emergency action plan (EAP), means a district group established under the *Disaster Management Act 2003*, section 22 whose disaster district under that Act could, under the plan, be affected by a *dam hazard.*
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.

Notice response	A dam owner's written response to a notice following an assessment of an EAP by a local government or *district group*.
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.
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.
Referable dam	A dam, or a proposed dam after its construction, will be a referable dam if: a failure impact assessment of the dam, or the proposed dam, is carried out under the *Water Supply Act 2008*, 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
Terrorist activity	A deliberate attempt to damage or fail a dam.

1 Introduction

This Emergency Action Plan (EAP) is provided to guide the Department of Resources (DoR) and relevant entities in the event of an incident or flood flows being released from Corella Dam that compromises the safety of persons and/or property immediately downstream of the dam. The Dam is located on the Corella River, west of the township of Cloncurry and the areas of concern includes the camping areas near the dam and the downstream *Corella Park Station* and *Carsland Station* rural homesteads.

The EAP provides an overview of the dam (including technical data), activation and trigger levels with respect to the five identified potential emergency conditions and the roles and responsibilities of officers/entities under each emergency condition. Activity Tables for each of the five emergency conditions have been developed for quick reference of actions, including the priority order for notifications, warnings and evacuations of population at risk (PAR); and the event and review reporting.

1.1 Dam Owner

Corella Dam is an ungated dam owned by the State and managed by DoR. The appointed contractor that performs work at Corella Dam, including weekly inspections and rostering the Dam Inspection Officer (DIO) is RoadTek, a commercial business within the Department of Transport and Main Roads (DTMR).

1.2 Outline of the Dam

Corella Dam is located on the Corella River, between Cloncurry and Mount Isa, south of the Barkly Highway (see maps in Figures 1 and 2 and in Appendix 2).

Corella Dam is a concrete faced (gunite) rockfill dam built in the 1950's. The dam's concrete face extends above the dam crest as a raised concrete parapet wall. Excavation of the primary spillway channel through the hard silicified limestone on the right abutment provided rockfill material for the dam embankment. The spillway chute discharges water back into the Corella River.

The original spillway contained a gated control structure, which has been removed, including its supporting concrete works. This leaves the irregular rock bed of this unlined channel controlling the reservoir's Full Supply Level. An auxiliary spillway channel has been excavated through a saddle in a low ridge located 1.2 km north of the dam's left embankment. The auxiliary spillway discharges water into a tributary that reconnects to the Corella River downstream of the dam.

There are no outlets or water release infrastructure through or under the dam embankment. There are currently no operational outlets for Corella Dam apart from the spillways. Water discharging from the dam will flow in a north-easterly direction, crossing the Barkly Highway 10.6 km downstream from the dam.

The area immediately downstream of Corella Dam at Clem Walton Park and along the reservoir foreshore is popular with campers, particularly in winter.

Houses at *Corella Park* will be inundated if there is a dam failure during a flood exceeding the 100-year Average Exceedance Probability (AEP). According to the Failure Impact Assessment (FIA) conducted in April 2019 by GHD, no buildings are expected to be flooded at *Carsland*. (For location see plans in Appendices 2 and 3).

The isolated location of Corella Dam prevents it from being easily accessed and monitored manually during heavy rainfall events. Telemetry was installed at Corella Dam in 2014 to remotely monitor reservoir water level, rainfall and V-notch weir levels (seepage). Automatically activated Short Message Service (SMS) alerts are sent to key DoR personnel at predetermined critical trigger levels (Appendix 6).

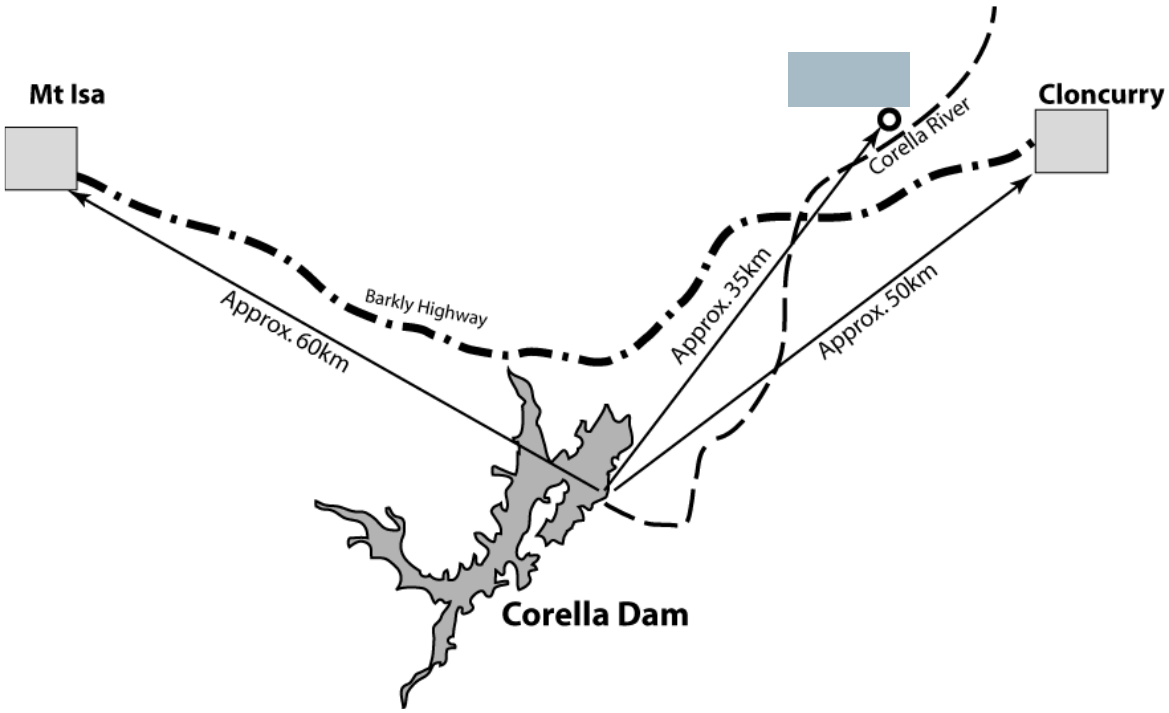


Figure 1 – Corella Dam Locality Plan

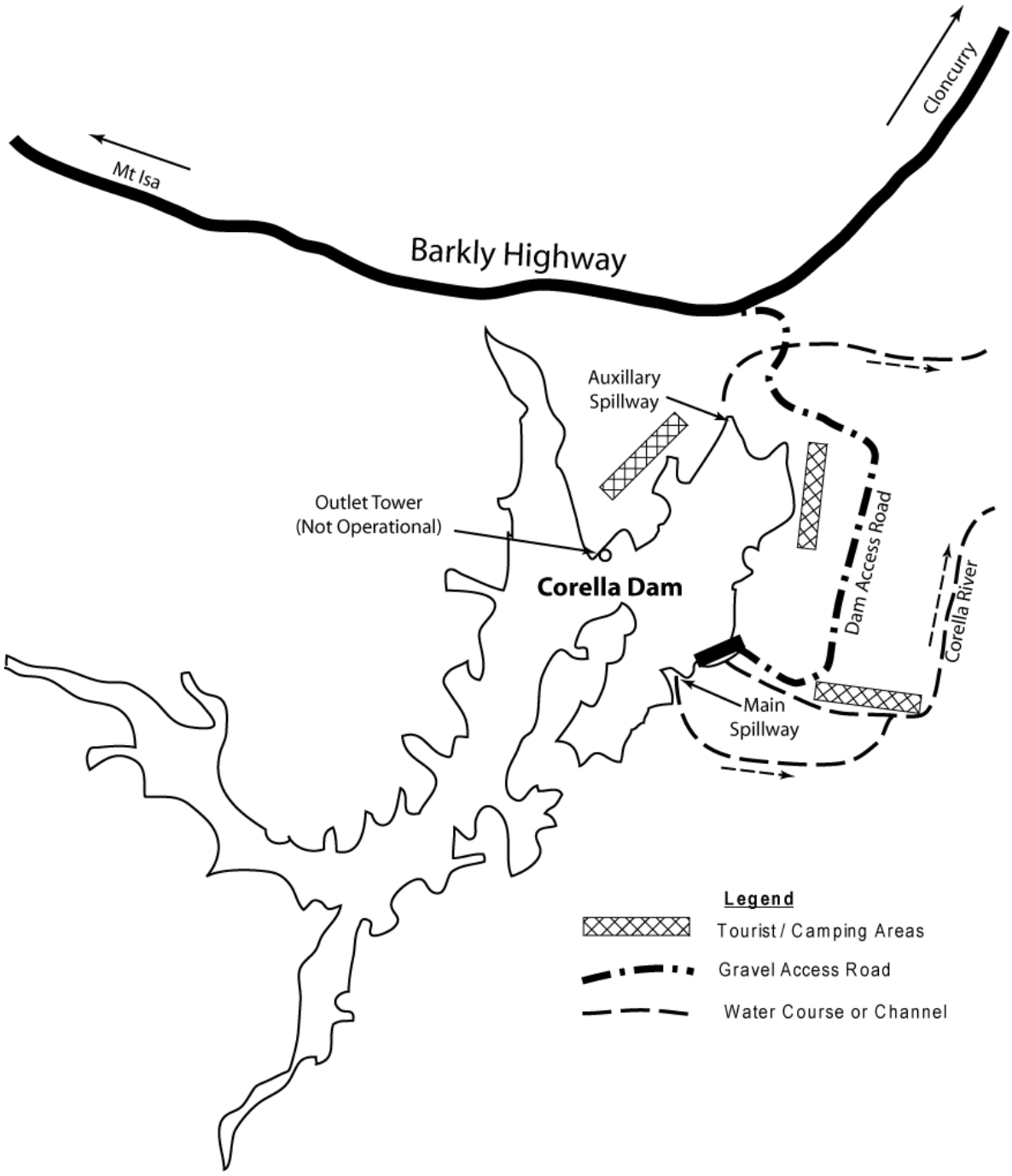


Figure 2 – Corella Dam Layout & Access Plan

1.3 Travel Directions and Vehicle Access to Corella Dam

Corella Dam is located south of the Barkly Highway between Mount Isa and Cloncurry. The turnoff (signed Clem Walton Park) is 58km from Mount Isa and 52km from Cloncurry. The embankment is about 3km from the turnoff on an all-weather but unsealed road.

The access road initially crosses the auxiliary spillway prior to the boat ramp. Access across the auxiliary spillway must not be attempted when the auxiliary spillway is flowing. This section of road is generally in good condition. The next section of access road then runs over a ridge to Clem Walton Park, then along the left bank of the Corella River and onto the dam embankment through three locked gates. Sections of this road can be eroded and/or waterlogged after rain and high river flows.

1.4 Flood releases and agreed coordinated response

The Corella Dam Failure Impact Assessment (FIA) (April 2019) undertaken by GHD determined that:

> The dam is assessed to have a Category 1 failure rating and is therefore referable.
>
> There is no Population at Risk (PAR) for Sunny Day Failure Scenario at either *Corella Park* or *Carsland* (however the area immediately downstream and along Corella Dam's foreshore is popular for camping, particularly in winter).
>
> There is an identified downstream Population at Risk (PAR) for a Flood Event Failure Scenario is estimated at up to 10 people.

The activity tables in section 5 of this document outline the agreed coordinated response by DoR and the LDC. The tables set out the operations and activities that the relevant parties will undertake for each emergency event. Discussions with relevant stakeholders regarding the operations will be ongoing as necessary.

1.5 EAP Requirements under the Water Supply (Safety & Reliability) Act 2008

Under the *Water Supply (Safety and Reliability) Act 2008* (the Act), 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.

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 hazards (e.g. flood operations):

1. Identify the area likely to be affected by a dam hazard event or emergency event arising from the dam hazard, including, for example, by attaching to the plan maps showing areas vulnerable to flooding if the event were to happen; 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 the dam hazard event or emergency event, including the order of priority in which the persons or categories of persons are to be warned; and 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

4. 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 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 local government (or district group); and any responses which the owner gives to these notices. Section 352H (1) further stipulates that an EAP must include any other relevant matter prescribed by regulation.

The local government whose area may be affected by a dam hazard for Corella Dam has been assessed as Cloncurry Shire Council (CSC). CSC has been provided with a copy of the draft EAP for assessment.

Section 352HC of the Act states that a district group may review the EAP for consistency with its disaster management plan. The district group for Corella Dam is Mount Isa Disaster Management Group (DDMG).

1.6 Objective of the Corella Dam EAP

The objective of this EAP is to:

1. Outline a detailed plan for TS officers to follow to minimise the risk of harm to persons or property if a dam hazard event or emergency event for the dam occurs.
2. Identify dam hazard events that could occur at Corella Dam and the areas likely to be affected.
3. Provide emergency actions taken by the dam owners and operating personnel in identifying and responding to dam hazard emergency/emergency events and notifying and coordinating responses for relevant entities.
4. Outline the communications and actions for informing CSC LDMG, relevant DMGs and the broader community during the activation of this EAP.

1.7 Development of the Corella Dam EAP and continuous improvement

This EAP has been prepared in accordance with Chapter 4 of the Act, and has involved continuous collaboration over several years with Local Government, DMGs and downstream PAR. Operational elements of the EAP have been refined over time as the lessons have been identified during various activations of the EAP.

The triggers and messages have been carefully crafted based on discussions and feedback from all relevant entities that have been identified within this EAP. Each year TS staff:

Consult with all relevant stakeholders with the aim of making improvements when the EAP is reviewed.

Meet or talk with the downstream PAR, CSC and DMG representatives to discuss any proposed changes to the EAP.

Are involved in the Mount Isa DDMG as liaison officers, to ensure that the Mount Isa DDMG is well informed on the dam safety issues surrounding Corella Dam. This allows all parties to understand their role and responsibility during the activation of the EAP, and what actions they may need to take.

Actively seeks feedback from all relevant entities to ensure that improvements can be made on a continual basis.

1.8 Training

TS has taken a proactive and collaborative approach to EAP training and running exercises. Each year, typically before the wet season, TS runs a series of internally coordinated workshops and scenarios to test the effectiveness of the EAP. Depending on availabilities, external agencies and/or Local Government are included to test various scenarios. This ensures that all stakeholders understand their role and responsibility under this EAP and that it appropriately aligns with local and district disaster management plans. New employees to TS are given a briefing and walkthrough of the EAP to understand their role and responsibility during an event. If an event occurs, new employees will be assisted through the processes to ensure all important communications and actions are undertaken.

1.9 EAP activation decision making process

This EAP will be activated by the Emergency Event Coordinator (EEC) (refer section 5) when the situation reaches ALERT except in the event of a terrorist threat or event which goes straight to STAND UP.

When a dam hazard event or emergency event is occurring, an Emergency Response Team (ERT), under the DM, is formed to monitor the event and undertake actions where required. To escalate or de-escalate the EAP, the ERT will discuss the current situation at the dam and any logistical issues which need to be managed (e.g. the management of staff resourcing, the timing of contacting PAR) before making a decision. Although ultimately it is the DM's call, an outcome is agreed amongst the ERT before a formal decision is made. As an example, for a flood event the following information would be assessed on a qualitative and quantitative basis as part of the decision-making process:

Current reservoir water level and the rate of rise;

Recorded rainfall by nearby pluviometers;

The BOM radar and the intensity of rainfall over the dam catchment;

The 1-7 day forecast for Cloncurry; and

Time of day – when should notifications be made to ensure a high likelihood that they are seen/heard.

Once the ERT has an agreed position, actions will be undertaken as outlined by the EAP.

1.10 Logistical Issues

To ensure logistical flexibility for the ERT during a dam hazard event or emergency event, the ERT may elect to modify some of actions and communications within the EAP, including (but not limited to):

Timing of EAP activation, notifications and warnings - it is important to note that each event is unique in circumstance and that the ERT may elect to activate the EAP before said triggers are reached if the above information sources suggest that the EAP will require activation. The EAP may be pre-emptively activated if it can be established that trigger levels are likely to be reached late at night or very early in the

morning. This proactive approach allows a ‘plan of attack’ for the ERT to be put in place and for messaging to be sent out during normal community waking hours.

Content of the notifications and warnings - messaging may be changed to reflect the unique circumstances of the dam hazard event or dam emergency event.

Management of staff resources – during the early stages of an EAP activation (particularly with some flood events) there is more flexibility for how the dam is monitored. During long drawn out flood events there may be opportunities to lengthen the intervals for monitoring at Alert level, particularly at night (10pm-6am). However, when the EAP progresses into Lean Forward and stand-up constant monitoring or monitoring at short intervals (1-2hrs) will be adhered to.

1.11 Dam Hazard Identification

The emergency action planning for Corella Dam has identified each potential hazard for the dam below and has determined how dam hazards could become a dam hazard event or a dam emergency event. The areas likely to be impacted by a dam hazard event or dam emergency event can vary greatly depending on the circumstances of the event, the RWL and whether the dam fails. This EAP contains the likely impacts during SDF, DCFF and PMPDF scenarios; therefore, covering the areas likely to be impacted in ‘worst case’ scenarios.

Dam hazard	May become a dam hazard event or emergency event when
Flood event	Spillway outflows from the dam may harm persons or property or there is a failure of the dam, where the water level is between FSL and DCL, which may harm persons or property.
Structural issue / Sunny Day Failure	The embankment is breached, causing a dam failure and the subsequent outflows from the dam may harm persons or property.
Chemical/toxic spill	A chemical or toxic spill may harm persons or property.
Terrorist Threat/Activity or High Energy Impact	A structural issue is caused which initiates a dam failure and outflows from the dam may harm persons or property.
Earthquake	A structural issue is caused which initiates a dam failure and outflows from the dam may harm persons or property.

Dam hazard event

A dam hazard becomes a **dam hazard event** when persons or property may be harmed due to the event, but the actions undertaken by the dam owner is unlikely to require a coordinated response involving two or more relevant entities. This applies when;

Notifications are given to all relevant entities but there is no requirement for an evacuation.

Dam emergency event

A **dam emergency event** is an event arising from a dam hazard where persons or property may be harmed and coordinated response involving two or more relevant entities is needed. This applies when;

> Warnings are given during STAND UP to all relevant entities and evacuations have been recommended.

Emergency Event Report

An Emergency Event Report (EER) will be provided as required by section 352T of The Act. Generally, an EER will be provided if there has been a flood of record or the dam has reached Stand up activation level and a coordinated response with relevant entities is needed.

As a guide, the EER should include the following:

> A description of the emergency event;
>
> Information on the implementation of the EAP including details of communications, actions and monitoring;
>
> A description of any damage to the dam, and whether the damage is related to the emergency event;
>
> Relevant photographs;
>
> An assessment of the efficacy of the EAP for the emergency event;
>
> Recommendations for updates to the EAP; and
>
> Any other relevant matters or other matters prescribed under a regulation.

The following colour coding has been used in this EAP that corresponds to each level of alert or status:

Table 1 – Alert Status Colour Coding

Status	Description / Situation
NORMAL SPILLWAY DISCHARGES SOP 14	Conditions identified or developing that could escalate and impact on the safety of Corella Dam persons and/or property immediately downstream of the dam and may include: Observed, monitored or forecast rainfall to result in inflows and Reservoir Water Level (RWL) rising above full supply level (discharge through the main spillway above EL 297.6m); Normal spillway discharge up to EL 299.0m.
ALERT	Conditions identified or developing that could escalate and impact on the safety of Corella Dam persons and/or property immediately downstream of the dam and may include: Development of conditions (or received information) that warrants more frequent or continuous monitoring of weather forecasts, rainfall, RWL or seepage; Rising reservoir levels over EL 299.0m; Potential for inflows and reservoir water levels rising to above EL 299.5m, the level where discharges through the auxiliary spillway commence and major flows already over main spillway at EL 297.6m; Other situation or issue that compromises the structural integrity of Corella Dam resulting in the possible failure of the dam. Conditions that have the potential to cause a downstream hazard.
LEAN FORWARD	Conditions identified or developing that have the potential to place a population and/or property at risk (i.e. flooding, identified, observed or reported dam safety issues) included: Observed, monitored or forecast rainfall to result in inflows and reservoir levels rising above full supply level to over EL 299.5m (have discharge through the main spillway at 297.6m and flows commence through the auxiliary spillway at EL 299.5m). Identification of dam structural issues that may compromise the structural integrity of the dam. The dam embankment is intact but there is the potential for it to fail.
STAND UP	Conditions have been identified or exist where an emergency situation has been identified and there is a population and/or property at risk from flooding include: Discharges taking place or forecast to take place through the main spillway above EL 301.0m, the Historical Maximum; Discharges taking place through the auxiliary spillway; Major flooding downstream of Corella Dam requiring evacuations to take place; Reports of damage to the dam.
STAND - DOWN	Conditions exist or are developing where rainfall and inflows to Corella Dam are reducing and discharges from Corella Dam is reducing. Conditions may include: Reduction in reservoir water levels and spillway discharges (discharges through the auxiliary spillway have ceased); Downstream flooding has reduced and is no longer a threat to the public and PAR; Risks assessed as being low.

1.12 Communications

1.12.1 Notifications and Warnings

The priority order can change for different dam safety situations and the order in which individuals or organisations are to be notified can be different for different events and different Activation Levels. Particular attention needs to be given to the priority order in the communication Activity Tables in Chapter 5.

Flooding in the Corella River and discharges from Corella Dam are expected as a result of a low pressure or cyclonic rain system over the area. The Activity Tables provided in this EAP provide an indication of when notifications, warnings and, if required, evacuations of impacted campers and landholders/residents needs to take place. It is however noted that for other reasons initial warnings and evacuation of impacted residents at an earlier stage than that outlined in this EAP may have occurred (i.e. other local emergency plans have been activated, for example the Local Disaster Management Plan held by Cloncurry Shire Council).

There is considerable uncertainty in the values of flood travel times and thus early warning should be given to PAR on being aware of a potential dam break event or flooding issues from the dam.

A proactive response and early notification, warning and/or evacuation may occur, rather than waiting for dam RWL triggers to be reached. During a dam hazard event or dam emergency event TS maintains an open line of communication with relevant entities to ensure that all parties are kept well informed. Contextualised messaging, contact lists and evacuation plans are contained in the subsequent sections and appendices of this EAP. Messaging for each activation level has been developed based to reflect the level of attention or urgency needed by the downstream community, local government or relevant DMGs.

The process for issuing notifications and warnings is outlined in the Activity Tables in Chapter 5 of this EAP. It is important to note that priority order is implied by the order in which persons/entities are listed within the communication tables in Chapter 5. During an event where the EAP is activated, TS aims to keep all entities well informed with Sitreps provided at stated times or if the conditions affecting the dam change. It is important to note that:

Internal Sitreps are sent by the EEC to the ERT via email.

External Sitreps are sent by the DM or EEM. It will include a summary of the dam/s status and the required actions.

An example of internal Sitreps is provided below. The content of Sitreps may be altered to suit the circumstances of individual dam hazard events or dam emergency events.

Template: SitRep for Internal Stakeholders (to be modified according to situation)

resources.QLD.GOV.AU

CORELLA DAM – SITUATION REPORT Technical Services – Asset Management Department of Resources		
EVENT: xxxxx (e.g. flooding)		
Daily Sitrep No:	Date:	Timing:
XXX	Xx/xx/xxxx	e.g. 0800
Reviewed		
Emergency Event Manager	<<< OR >>>	
Approved and from:		
Director Asset Management		

Corella Dam

- Located between Cloncurry & Mount Isa in North West Queensland
- https://www.qld.gov.au/environment/water/catchments/state-owned-dams

Current Status

- EAP activation status: ALERT/LEAN FORWARD/STAND UP/STAND DOWN
- Reservoir water level trend is steady/rising/falling
- Current level is XXX.XXm (XXX.XXm over spillway) (current at DATE/TIME)
- BOM radar indicates XXX
- BOM forecast is XXX

Current actions

- Frequency of monitoring xxxxx
- BOM forecast rainfall, river conditions and radar Xxxxx
- Inspections Xxxxx
- Notifications to xxxxxx

Background Information about Corella Dam

- Full Supply Level 297.6m
- Moderate Flood Level (Alert) occurs at 299.0m – Provide notifications
- Moderate/Major Flood Level (Lean Forward) occurs at 299.5m – Prepare for evacuations
- Major Flood Level (Stand Up) occurs at 301.0m – Advise Evacuations

Queensland Government

1.12.2 Communication Systems

Communications shall include both communication to the PAR as well as communications between the dam owner and the relevant entities required to deliver the appropriate response, scalable to the emergency event.

The means of communication to be engaged for this EAP shall include:

Face to face meetings – DIO/other visiting and notifying the PAR

Landline Telephone

Mobile Telephone (limited coverage)

Satellite Telephone

Email

SMS/Text

Queensland Government website (refer to Appendix 13)

Cloncurry Shire Council Facebook and/or website for broader community messaging.

1.12.3 Redundancy Plan – Communication

In the event that landlines, mobiles, satellite phones are not operating in this location, the use of UHF radio (Channel 40) will be the main means of local communication until all communication systems resume.

1.13 References and Associated Documents

The following is a list of references, including relevant legislation and key documentation, applicable to this EAP.

Water Supply (Safety and Reliability) Act 2008

Disaster Management Act 2003

Department of Natural Resources, Mines and Energy *"Queensland Dam Safety Management Guidelines, October 2020"*

Department of Natural Resources, Mines and Energy *"Guideline for failure impact assessment of water dams, November 2018"*

Department of Regional Development, Manufacturing and Water *"Emergency Action Plan for Referable Dam Guideline, June 2021"*

Australia National Committee on Large Dams (ANCOLD) Guidelines

IGEM Review of SEQWater and SunWater Warnings Communications Report 1/2016

Corella Dam Failure Impact Assessment (GHD, 2019)

1.14 Other Risks and Issues

The weather event(s) likely to lead to activation of this EAP may also have the following implications:

Roads to and from Corella Dam, including the Barkly Highway may be impassable due to localised flooding, downed power lines and trees or vegetation across the roads;

The access road leading from the Barkly Highway into Corella Dam (Clem Walton Park Road) is a gravel road and it may become impassable due to:

- Localised flooding (discharges taking place through the auxiliary spillway);
- Muddy or slippery road conditions;
- Washouts;
- High winds making road travel difficult or unsafe;
- Road closures;
- Emergency services already occupied with other storm event related issues; and
- Limited number of resources available within the area to assist with implementation of the EAP.

Irrespective of the weather conditions, road conditions may also have the following risks:

Uneven surfaces including rutting and corrugations;

Native wildlife (kangaroos etc.) or farm animals on or beside the road; and

Large vehicles (road trains).

In the event of water levels rising in Corella Dam where discharges are taking place through the auxiliary spillway there will be no access to the dam embankment as the discharge through the auxiliary spillway will inundate the access road.

The monitoring system at Corella Dam relies on a telemetry system that utilises the mobile and satellite phone network. Storm damage to the mobile phone network or damage to the onsite equipment (such as from a lightning strike) may make the system inoperable. Similarly, adverse weather conditions may impact on the site being able to connect to the mobile / satellite phone system.

Any dam operators or other persons located at the dam during a storm event may be isolated until such time as the flood waters recede or alternative arrangements are made to rescue them. This will be dependent on suitable weather conditions prevailing or the access roads being passable or safe to travel on.

1.15 Technical Data

The following technical data is provided for Corella Dam:

Table 2 – Corella Dam Technical Data

Name and location	
Name of Dam	Corella Dam
Other Names	n/a
Location	Latitude 20° 50’ 37” Longitude 140° 02’ 53.002”
Region	North West Queensland
Shire	Cloncurry
Nearest Town	Cloncurry
Stream and AMTD	Corella River 204.5 km
Ownership	
Licence No	409418
Development Permit	11/03/2019 Information Notice changing safety conditions for Corella Dam, Dam ID 0258.
Current Owner	Queensland Government (managed by Department of Resources)
Designer (Date)	Gutteridge Haskins and Davey Pty Ltd (mid 1950s)
Construction Authority – Supervisor	Gutteridge Haskins and Davey Pty Ltd
Construction Date	1956 – 1957
Construction Contractor	Thiess Bros (Qld) Pty Ltd
Safety review dates	2004 (next required 2024)
Technical data	
Dam Type	Rock-fill with 75 mm to 100 mm thick Gunite slab on the upstream face
Purpose	Water supply to Mary Kathleen Uranium Mine (no longer operational) Water supply for stock and recreation at present
Main Dam Height (above lowest toe)	23.07 m with parapet wall to 24.60 m
Main Dam Length	146 m
Spillway Type	Main – Uncontrolled channel spillway on the right abutment of the dam Auxiliary – Uncontrolled channel spillway
Spillway Description	Main – Spillway width of 34.8 m Auxiliary – Spillway width of 65 m
Outlet Description	N/A. Original outlet works consisting of an intake tower, pump and pipeline to the township have been decommissioned
Reservoir characteristics	
Full supply level (FSL)	EL 297.6 m AHD

	(FSL confirmed by surveyor in 2020)
Reservoir capacity (after lowering of spillway)	10,500 ML (from DWG A3-78017 Reservoir Curves-QWRC)
Surface area	200 ha (from DWG A3-78017 Reservoir Curves-QWRC)
Length of shoreline	Unknown
Main Spillway capacity	970 m^3/s at Dam Crest Level EL 304.55 m 1069 m^3/s at EL 305.18 m, 0.9 m below top of parapet
Auxiliary Spillway capacity	1600 m^3/s at Dam Crest Level EL 304.55 m 2000 m^3/s at EL 305.18 m, 0.9 m below top of parapet
Combined Spillways	2570 m^3/s at Dam Crest Level EL 304.55 m 3069 m^3/s at EL 305.18 m, 0.9 m below top of parapet
Dam crest level (DCL)	EL 304.55 m Parapet wall to EL 306.08 m
Catchment area	33,300 ha
Catchment description	Lightly timbered rocky ground
Design Rainfall Review	Design Flood Hydrology Review-Maunsell
Methods	ARR (1999), GTSM-R PMP data from BOM (2003), CRC-FORGE data from DNRME
1 in 50 000 AEP Flood	
Maximum Level	EL 305.58 m
Flood Volume	Unknown
Peak Discharge	3069 m^3/s
AEP of Flood	1 in 50 000
Freeboard	0.9 m from top of parapet wall
Description of dam wall	
Wall Type-Main Wall	Rock fill with 75 mm to 100 mm thick Gunite slab on the upstream face
Wall Height (above lowest D/S toe)	23.07 m with parapet wall to 24.60 m
Crest Elevation (based on 2003 survey by RoadTek)	EL 304.55 m Parapet wall to EL 306.08 m
Elevation of Foundation	EL 281.48 m
Wall Length	146 m
Wall Description (dimensions and zone arrangements)	3 m wide crest with 1.5 m high parapet wall on upstream side. Dumped and sluiced rock-fill with slopes of 1.25:1 (H:V) Upstream and downstream with 75 mm to 100 mm Gunite slab placed in 9.1 x 9.1 panels
Total Quantities	Rockfill – 84,000 m^3
Materials Description	Silicified limestone from the spillway excavation placed as dumped rock-fill with Gunite facing

Description of spillway	
Main spillway	
Spillway Description	The spillway is an unlined cut through the right abutment
Spillway Crest	EL 297.6 m
Plunge Pool Floor	EL 280 m (approximate)
Spillway Width	34.8 m
Energy Dissipation Method	Plunge pool
Control Description	Gates, decommissioned (before remedial Works) Uncontrolled (after remedial works)
Auxiliary spillway	
Spillway Description	Unlined cut through saddle 1.2 km northeast of embankment
Spillway Crest	EL 299.5 m
Spillway Width	65 m (approximate)
Energy Dissipation Method	n/a
Control Description	Uncontrolled
Description of outlet works	
Reservoir Outlet Description	Decommissioned.
River Release Conduit Description	n/a
Hydrologic Performance	
Peak Reservoir Level	EL 304.8 m (1971) *It should be noted that this listed event occurred before the major modifications and lowering of the spillway crest levels in 2004.*
Peak reservoir level	EL 303.3 m (1997) *It should be noted that this listed event occurred before the major modifications and lowering of the spillway crest levels in 2004.*
Peak Reservoir Level	EL 299.518 m (2018)
Peak Reservoir level	EL 300.039 m (2019)

1.16 Critical Reservoir Water Level Triggers

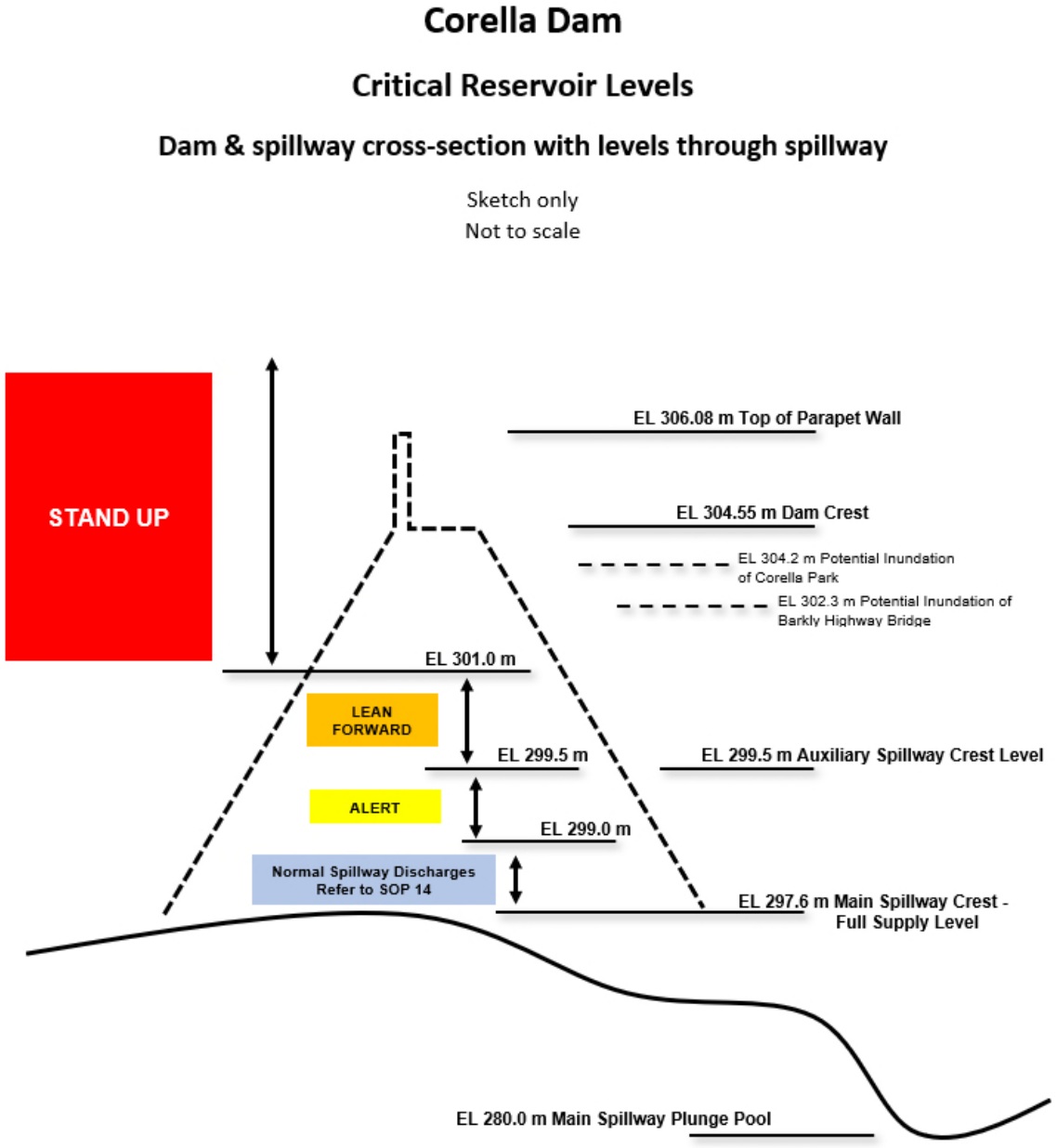


Figure 3 – Key Reservoir Water Levels

Refer to Appendix 9 – Critical Reservoir Water Levels

1.17 Corella Dam – Remote Sensing and Alert System (RSAS)

A Remote Sensing and Alert System (RSAS) has been installed on the crest of Corella Dam. The data recording and telemetry equipment contained in a cabinet provides:

Real time monitoring of key water levels and forwarding of data;

Activation of alarms when critical reservoir water levels have been reached;

Monitoring of the dam embankment seepage V-Notch weir;

Rainfall; and

Voltage of the batteries powering the onsite instruments and controls.

The system uses the local mobile system (Next G) to communicate the site data to users, with back-up redundancy using a satellite telephone system.

The RSAS records the input from a number of site instruments and forwards the details either on a regular basis (pre-set time interval) or in the event of an alarm level being reached an immediate update of site conditions.

The RSAS and the site instruments are powered by batteries, which are electrically maintained by solar panel, located on the top of the RSAS each cabinet. The system is capable of operating for several days of heavy cloud cover which prevents recharge of the batteries. However, cloudy conditions and wet weather may create poor mobile phone and satellite phone reception at the site and result in communication failure with the RSAS system.

The RWLs monitored and recorded by the RSAS are:

Upstream dam reservoir water level (two separated systems measure upstream dam reservoir water level offering redundancy);

V-notch weir located in the weir pool of the seepage monitoring weir; and

Rainfall at the RSAS system.

Details of the use of the RSAS website are in Appendix 6.

1.18 RSAS Redundancy Plan

If telemetry and RSAS are not operating, the receipt of local intelligence and monitoring of the Bureau of Meteorology web site (*www.bom.gov.au*) on predicted rainfall and weather conditions will provide updates to any situation until telemetry and communications resume.

1.19 Bureau of Meteorology

Useful information can be obtained from the Bureau of Meteorology (BoM) website (including RSAS data) that can assist in assessing the potential rainfall and development of flood inflows to Corella Dam. The information includes “weather radar” images (refer to the Mount Isa based radar).

Details on the use of the BoM site are in Appendix 6.

1.20 Maintenance and Inspections

Corella Dam is maintained and inspected in accordance with the safety conditions relevant to the dam and the Queensland Dam Safety Management Guidelines.

Corella Dam has undergone an upgrade to ensure that it has adequate spillway capacity and features to reduce the likelihood of the dam being overtopped or developing a breach or failure.

The dam is inspected regularly including:

Periodic inspections by experienced operators on a weekly basis

Three monthly inspections by a qualified dam engineer (RPEQ)

Annual inspection and written report by a qualified dam engineer (RPEQ)

Comprehensive inspections on a 5-yearly basis

Dam safety reviews (last one undertaken in August 2021 by GHD).

Special inspections are also undertaken following any major events such as major flood inflows and discharges through the dam spillway or reports of any major damage or interference to the dam.

2 Uncontrolled Releases

Uncontrolled releases occur when the spillway is operating. Cloncurry Shire Council and RoadTek are responsible for managing the road closures and appropriate signage.

The original gated control structure on the Corella Dam main spillway has been removed, including all concrete works. There are no outlets or water release infrastructure through or under the dam embankment. There are currently no operational outlets for Corella Dam apart from the spillways.

An auxiliary spillway has been constructed by excavation of a channel through a low saddle 1.2 km north of the dam embankment. The auxiliary spillway discharges water into a tributary that reconnects to the Corella River downstream from the dam.

3 Downstream Release Hazards

3.1 Persons

Flooding downstream of Corella Dam does not impact on any major urban centres or large townships. The Population At Risk (PAR) is the transient campers in the immediate vicinity of the dam, *Corella Park* homestead and *Carsland* homestead.

A “Sunny Day” failure of Corella Dam (i.e. dam failure during a period of nil or low inflow to the dam) will affect campers immediately downstream of the Dam at Clem Walton Park but will have no impact the *Corella Park* homestead or *Carsland* homestead. In the cooler months, larger numbers of travellers (over 100 at times) camp along the foreshore of the Corella Dam reservoir. These campers would not be affected by a “Sunny Day” failure.

3.2 Property

Flooding downstream of Corella Dam does not impact on any major urban centres or large townships. The main downstream impact is:

Inundation of the road bridge on the Barkly Highway where it crosses the Corella River;

Rural homesteads at *Corella Park* and *Carsland*;

Inundation of the road bridge on Burke Developmental Road where it crosses the Corella River.

3.3 Roads

Road inundation and the need for road closures will need to be implemented by the Local Disaster Management Group (LDMG) (Cloncurry Shire Council / Department of Transport and Main Roads (DTMR) and RoadTek) and will seek assistance from other local entities when required (i.e. Queensland Police Service (QPS) and where required the local State Emergency Service (SES)).

Roads that will be impacted include Corella Dam access road (Clem Walton Park Road), the Barkly Highway, and Burke Developmental Road.

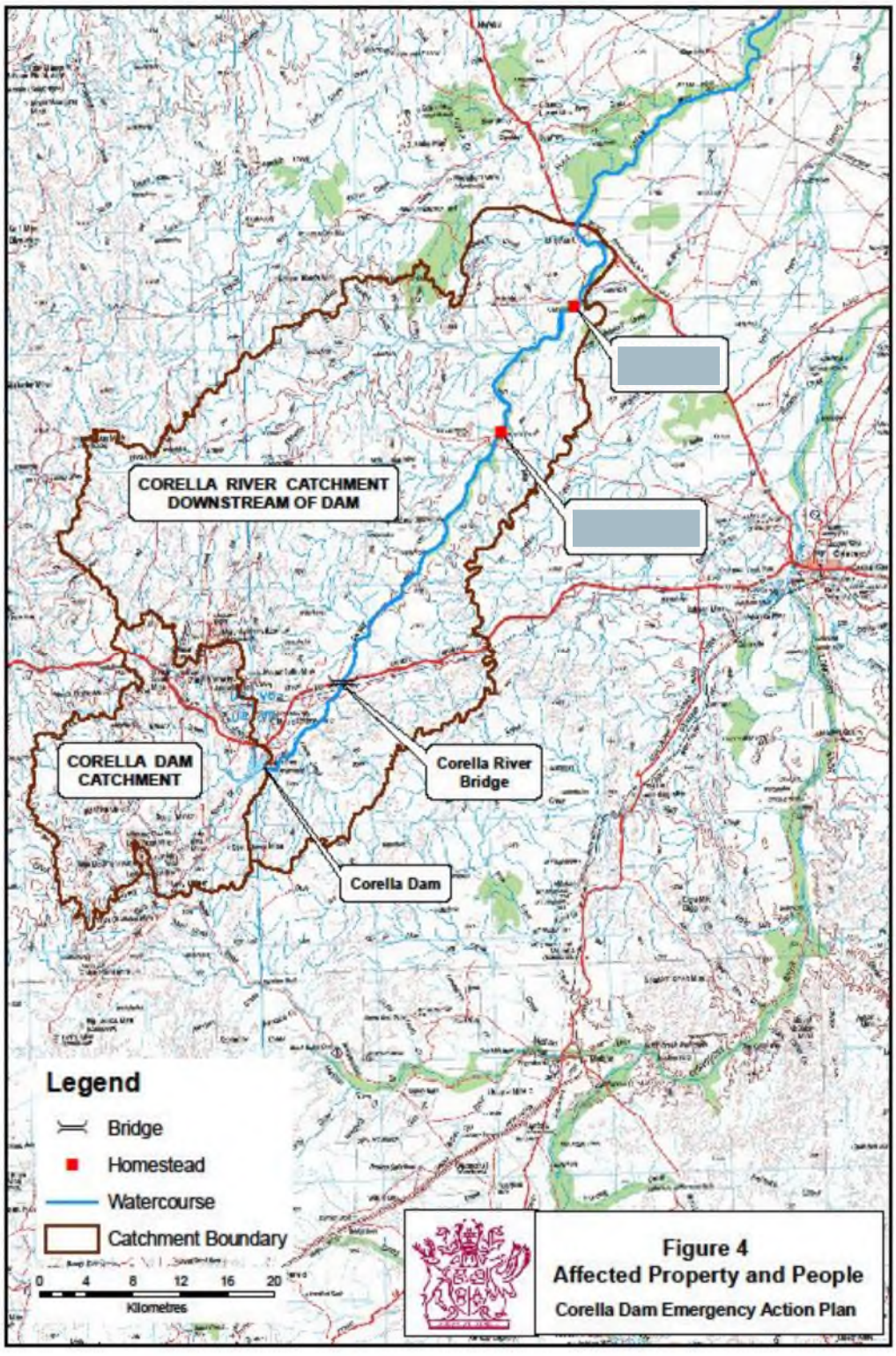


Figure 4 – Impacted persons and property

4 EAP Roles and Responsibilities

4.1 Department of Resources as Dam Owner

DoR acts on behalf of the State Government as owner of Corella Dam. The Dam Owner is responsible for developing a regulator approved EAP under the *Water Supply (Safety and Reliability) Act 2008*. DoR have a Memorandum of Understanding with RoadTek to deliver certain functions under the EAP on its behalf as outlined below.

4.1.1 Emergency Event Coordinator (EEC), Technical Services DoR

The EEC is the TS officer who is responsible for coordinating an emergency event and activating the EAP.

During an event the EEC shall:

Activate the EAP as per Section 5 when the situation reaches ALERT except in the event of a terrorist threat or event which goes straight to STANDUP.

Advise Emergency Event Manager (EEM) that EEC is coordinating the response to the event and confirm that the EAP is activated in response to an event;

Monitor conditions at Corella Dam using a combination of reports from the DIO(s), RSAS web site and BOM web site;

Monitor all emergency events;

When an event at Corella Dam has reached or is likely to reach a reservoir trigger level, make notifications as per Activity Tables 7, 15, 23, 31 & 38;

Refer high risk activities to the EEM, as appropriate and/or as per Departmental policy;

Evaluate reports from DIO and provide directions where required in this plan;

Provide regular updates during emergency events to the Local Disaster Coordinator (LDC);

Maintain an event log of all communications received, communications sent, actions taken and observations.

4.1.2 Dam Inspection Officer (DIO), RoadTek

The nominated or duty DIO shall undertake the following:

Advise any tourists or campers to leave the dam site or areas downstream of the dam if possible and safe to do so; once visitors have left the site, ensure the gate to the dam embankment is locked as well as the gate located on Corella Dam access road at Barkly Highway (Clem Walton Park Road) and display a road closed sign to indicate the dam site is closed.

Monitor the dam for any potential emergency conditions (high rainfall or storm events forecasted, dam safety issues, earthquakes, sabotage or vandalism).

Follow the Emergency Action Plan relevant for the specific emergency condition outlined in this document. Immediately notify the EEC when an emergency condition or potential emergency condition has been identified;

In the event of determining that a Structural/Sunny Day Failure, Terrorist Threat or Earthquake is developing or has occurred, immediately advise the EEC.

In an emergency event, take steps to ensure personal safety and the safety of other DIO and the public;

When an event at the dam has reached or is likely to reach a dam safety trigger level, make notifications as per Tables 6, 14, 22, 29 & 37;

Record details of the emergency event in the Event Log. This shall include details of all communications received and sent, observations and actions taken;

Take relevant photographs (dam safety issues, reservoir levels, etc.) and forward them to the EEC.

Provide regular reports / updates / changes to the EEC for evaluation during the emergency event. Updates are to be provided in the first instance verbally and followed up where possible by email;

During an emergency event, the DIO should refer all requests from the media for comments to the Chair, Cloncurry Shire LDMG;

In the likelihood that the DIO is unable to fulfil the duties, advise the DIO Backup of any intended absence from the area and leave a point of contact;

Immediately notify DIO Backup officer(s) when the EAP is being initiated;

Keep the EAP in a clean, secure location that can be readily accessed at short notice;

After an emergency event, send a copy of the event log to the EEC within 15 days.

4.1.3 DIO Backup, RoadTek

The nominated DIO Backup shall undertake the following:

Assist the DIO in times of emergency;

Follow the EAP relevant to the identified emergency condition outlined in this EAP;

Undertake the role and responsibilities of the DIO should that person be unavailable;

Attend the dam if possible and safe to do so;

During an event, DIO Backup shall attempt to establish communications with the DIO;

Maintain an event log of all communications received, communications sent, actions taken and observations;

Keep the EAP in a clean, secure location that can be readily accessed at short notice.

4.1.4 Dam Inspection Engineer (DE)

If directed by the EEC, the Dam Inspection Engineer will undertake a special inspection of the dam. A verbal update is provided in the first instance, followed up by comprehensive report including observations and photographs.

4.1.5 Emergency Event Manager, Technical Services, DoR (EEM)

The Emergency Event Manager on duty rotates each month, or as required for fatigue management, between the primary and secondary Emergency Event Manager. The Emergency Event Manager, TS DoR, shall undertake the following:

Annually:

Review the EAP by 1st September each year.

Supervise the annual EAP door knock with the EEC and LDMG to distribute updated evacuation plans.

Check that the DIO, DIO Backup(s) and counter disaster management entities are conversant with the EAP.

Distribute the EAP and any amendments / updates according to the EAP Distribution List.

During an event:

Monitor conditions at Corella Dam using a combination of reports from the EEC, RSAS web site and BOM website.

Confirm that this EAP is implemented in response to an event at the dam.

In the event that this EAP is activated, provide technical assistance and information to the LDMG as necessary to assist in the implementation of this EAP.

Make notifications and Sitreps as per Activity Tables 8, 16, 24, 32 & 39.

Refer high risk activities to the DM, as appropriate and/or as per Departmental policy.

Maintain an event log of all communications received, communications sent, actions taken and observations.

Within thirty (30) days of an event present an EER to the DM.

4.1.6 Director, Asset Management DoR (DM)

The Director, Asset Management, TS DoR, shall undertake the following:

Annually:

Review the EAP in consultation with the EEM by 1st September each year.

Authorises/approves this EAP.

Initiate a review as and when there are changes to the operating environment or assessed risk.

During an Event:

Review Sitreps and notifications as per Activity Tables 9, 17, 25, 33 & 40;

Provide advice and/or assistance to the EEC and EEM as required.

Direct the actions of departmental personnel during an emergency to protect life and property to the maximum extent considered possible under the prevailing conditions and with the resources available.

Maintain an event log of all communications received, communications sent, actions taken and observations.

Approve repairs and procurement for the emergency event and subsequent repairs or remediation.

4.1.7 Executive Director, Technical Services DoR (EDTS)

The Executive Director TS, DoR shall undertake the following:

Ensure departmental personnel protect life and property to the maximum extent considered possible under the prevailing conditions and with the resources available.

Review event reports and notify the Deputy Director-General, Georesources Division, DoR of the event.

4.1.8 Deputy Director-General, Georesources, DoR (DDGGeo)

The Deputy Director-General, Georesources, DoR shall undertake the following:

Notify the Director-General, DoR, of the event.

4.1.9 Director-General, DoR (DGDoR)

The Director-General, DoR shall undertake the following:

Keep the Minister informed.

Note the EER.

4.2 Local Government

The local government has responsibilities related to this EAP under the *Local Government Act 2009* and the *Disaster Management Act 2003*[1].

4.2.1 Mayor, Cloncurry Shire Council

The CSC Mayor, as the Chair of the Cloncurry Shire LDMG, shall undertake the following actions:

Be responsible for preparing a local disaster management plan for Cloncurry Shire Council, with the assistance of the LDMG including arrangements for public information and warnings.

Coordinate community education activities, including information on warnings.

Have a disaster response capability available for CSC.

Perform all other functions given to local government under the *Disaster Management Act 2003.*

4.2.2 Chief Executive Officer, Cloncurry Shire Council

The CSC Chief Executive Officer, as the LDMG Local Disaster Coordinator (LDC), shall undertake the following actions:

Annually

[1] Office of the IGEM 2015-16, Review of Seqwater and SunWater Warnings Communications, p87

Ensuring the disaster management and disaster operations in the area are consistent with the state group's strategic policy framework for disaster management for the state.

Developing an effective disaster management plan with CSC, and regularly reviewing and assessing the disaster management response capability.

Identifying and providing advice to the Mount Isa District Disaster Management Group about support services required by the CSC LDMG to facilitate disaster management and disaster operations as required for an event.

Ensuring the community is aware of ways of mitigating the adverse effects of an event.

Maintaining and distributing the polygon when mobile coverage is available.

During an Event

Ensuring information about a disaster in the area is promptly given to the Mount Isa District Disaster Management Group.

Issue all media releases and responses (through the Cloncurry Shire Council multi-modems) to media communications. Liaise with the Queensland Police Service and other agencies as necessary on wording of media releases.

4.3 Queensland Police Service (QPS)

The QPS have responsibilities related to this EAP under the *Disaster Management Act 2003*. The Queensland Police Communications Centre shall respond to notification of terrorist threat or activity. The QPS will coordinate its resources and responses as required for terrorist threat or activity. The QPS is part of the Cloncurry Shire LDMG and all messaging and responses shall be coordinated through the LDMG so there is no breakdown in communication, particularly during evacuation activities.

5 Emergency Events and Action Tables

In a flood and dam safety emergency situation, all persons involved in activation, management and implementation of this EAP are to note the following:

Weather situations likely to lead to implementation of this EAP are also likely to see intense rainfall conditions elsewhere in the area. This will increase the hazards and risks associated with implementing this plan. Hazards may include dangerous road conditions, reduced visibility, flooding of local roads, downed power lines and trees being blown over.

Resources required to respond to a dam safety event at Corella Dam may be limited due to these resources being deployed elsewhere in the region as a result of the wet weather event (downed trees, house roof damage etc.), and the limited number of resources available locally.

Under this EAP the following scenarios / situations are provided as a guide to the possible dam safety events and emergency situations associated with Corella Dam.

Flood Events – Section 5.1

Structural Issues/Sunny Day Failure – Section 5.2

Chemical/Toxic Spill – Section 5.3

Terrorist Threat or High Energy Impact – Section 5.4

Earthquake – Section 5.5

5.1 Flood Events

5.1.1 Estimated Population at Risk (PAR)

The following Population at Risk (PAR) estimate is provided as a guide to the possible number of persons at each location. Tourists upstream of the Dam have been included because they will need to be removed when the access gate to the Dam is closed and locked during an event.

Table 3 – Summary of Estimated PAR

Location	Possible PAR
Tourists Downstream of the Dam (Clem Walton Park)	Up to 40 campers
Tourists located on upstream side of the dam, and eastern side of Auxiliary Spillway (Boat Ramp)	Up to 80 campers
Corella Park Homestead	(10 – FIA, 2019) Up to 10 as advised by landholder Aug 2022
Carsland Homestead	(0 – FIA, 2019) Up to 10 as advised by landholder Aug 2018

5.1.2 Flood Travel Times

The following table displays the estimated travel times from Corella Dam.

Table 4 – Predicted travel times from Corella Dam Reservoir Peak

Location	**Scenario**				
	Sunny Day Failure	**1 in 100 AEP No Failure**	**1 in 100 AEP With Failure**	**1 in 20k AEP No Failure**	**1 in 20k AEP With Failure**
	Time to Peak (hours)				
Downstream Campers and Tourists	Minimal. Dependent on camping location.				
Barkly Highway Bridge, Corella River	1 hr	0.5 hrs	1 hr	1 hrs	1 hr
Corella Park H.S.	3 hrs	1.5 hrs	3 hrs	3 hrs	3 hrs
Carsland H.S.	4 hrs	4 hrs	5 hrs	5.5 hrs	5 hrs

The following table displays the estimated travel times from the Barkly Highway Bridge, Corella River.

Table 5 – Predicted Times to Peak from Barkly Highway Bridge, Corella River

Location	**Scenario**				
	Sunny Day Failure	**1 in 100 AEP No Failure**	**1 in 100 AEP With Failure**	**1 in 20k AEP No Failure**	**1 in 20k AEP With Failure**
Corella Park H.S.	2 hrs	1 hr	2 hrs	2 hrs	2 hrs
Carsland H.S.	3.5 hrs	3.5 hrs	4 hrs	4 hrs	4.5 hrs

There is considerable uncertainty in the values of flood travel times and thus prompt warning should be given to population at risk on being aware of a potential dam break event.

5.1.3 Flood Duration

For a Sunny Day Failure event the flood duration (expected period of time that flood conditions will exist) at the above locations is estimated to be in the order of 8 hours.

Flood duration for floods that are due to storm related events is likely to be longer than 8 hours and will depend on the nature of the storm and other factors. Storm related flooding is likely to be in excess of 1 day.

5.1.4 Flood Depths

The predicted depth of flooding is presented in the table below.

Table 6 – Predicted depth of flooding

Location	Scenario				
	Sunny Day Breach	**1 in 100 AEP No Failure**	**1 in 100 AEP With Failure**	**1 in 20k AEP No Failure**	**1 in 20k AEP With Failure**
Barkly Highway Bridge, Corella River Deck Level: 259.56m AHD	EL 262.1m	EL 259.8m	EL 263.9m	EL 262.07m	EL 265.15m
Corella Park H.S. Floor Levels: 206.78 – 207.63m AHD	EL 205.8m	EL 206.0m	EL 208.4m	EL 207.51m	EL 209.59m
Carsland H.S. Floor Level: 186.37m AHD (New House) 186.44m AHD (Old House)	EL 181.49m	EL 183.2m	EL 184.5m	EL 183.90m	EL 185.13m
Burke Developmental Road Bridge, Corella River Deck Level: 167.92m AHD	EL 169.00m	EL 168.15m	EL 172.08	EL 173.44m	EL 175.86

Activity Table 1 – Flood Events – Summary of Trigger Points and Actions

Reservoir Water Level (RWL) and Trigger Points	Action at Trigger Point	Action if RWL is rising or RWL is steady and further heavy rainfall[2] is likely	Action if no further heavy rainfall is likely and RWL is falling
EL 297.6 m Water at spillway level	DIO advises campers to leave and then locks gate on Corella Dam Access Road and displays road closed sign. EEC to change the website to state dam is closed (gain approvals first).		DIO to unlock gate on Corella Dam access road when RWL is less than EL 297.6 m and Corella Dam access road is assessed as being safe to re-open to the public. EEC to change website to state that dam is open (gain approvals first).
297.6m – 299.0m	SOP 14 for minor flows applies (refer Appendix 8)		
EL 299.0 m and rising End of SOP 14	Alert Status EEC notifies EEM and LDC that the EAP is activated	Monitor and report Update PAR Update LDC	Stand Down when a receding trend is established and RWL is less than EL 299.0m.
EL 299.5 m and rising	Lean Forward Status Notify EEM, LDC and PAR Warning		
EL 299.5 m – 301.0 m		Monitor and report Update EEM, LDC and PAR	
EL 301.0 m	Stand Up Status WARNING to PAR to EVACUATE WARNING to LDC		Stand Down when a receding trend is established, no additional rain the catchment and RWL is less than EL 299.0 m
EL >301.0 m (Historical Maximum)		Monitor and report Update EEM, LDC and PAR	Water receding. Continue to monitor and report. Update EEM, LDC and PAR Notify EEM, LDC and PAR that the event is over.

[2] Further heavy rainfall is considered to be in the order of 50 mm/hr

Activity Table 2 – Flood Events – DIO Emergency Actions

Activation Level	Normal Spillway Discharges SOP 14	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reservoir water level above EL 297.6 m (FSL)	Reservoir water level above EL 299.0m and rising.	Reservoir water level above EL 299.5m and rising.	Reservoir water level above EL 301.0m (Historical Maximum)	Reservoir water level below EL 299.0m and falling
Actions	Notify EEC Continue weekly inspections (or as advised by the EEC), if safe to do so. Advise campers to leave then lock the gate on Corella Dam access road and display road closed sign. Contact EEC to discuss if follow-up inspection/s are required to ensure all campers have vacated. Monitor regional & local weather conditions (BoM)	Notify EEC Cease inspections when RWL is greater than EL 299.0m Monitor regional & local weather conditions (BoM) Record data of the event and maintain an event log EER of all actions and communications.	Monitor regional & local weather conditions (BoM) Record data of the event and maintain an event log of all actions and communications.	Monitor regional & local weather conditions (BoM). Record data of the event and maintain an event log of all actions and communications	Return to SOP 14 activation status in consultation with EEC. Identify any damage or irregularities when safe to do so and forward to the EEC. Note: inspections to commence when RWL is less than EL 299.0m and falling and it is safe to do so, and in consultation with EEC. DIO to decide when the dam site is safe to be opened and notify DoR. Unlock the Corella Dam access road gate and remove the road closed sign when the RWL is below EL 297.6m and notify EEC. Forward event log EER and photos to DoR.
Notifications	EEC Campers	EEC	EEC	EEC	Notify EEC before inspections recommence.

Activity Table 3 – Flood Events – EEC Emergency Actions

Activation Level	Normal Spillway Discharges SOP 14	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reservoir water level above EL 297.6m (FSL)	Reservoir water level above EL 299.0m and rising.	Reservoir water level above EL 299.5m and rising.	Reservoir water level above EL 301.0m (Historical Maximum)	Reservoir water level below EL 299.0m and falling
Actions	Notify EEM that SOP 14 is in place. Follow SOP 14. Notify DIO that Corella Dam is spilling, and request they ask campers to leave the Site and lock the gate. Confirm with DIO if further follow-up inspections are required to ensure all campers have vacated. Request EEM approval to change website that dam is closed due to flooding.	Activate EAP in consultation with EEM Notify EEM and LDC that EAP is activated. Notify PAR that EAP is activated. Monitor regional and local weather conditions, as per Appendix 6. Record data of the event and maintain an event log of all actions and communications. Provide SitRep to EEM.	Escalate EAP in consultation with EEM Notify EEM, LDC and PAR. Monitor regional and local weather conditions. Record data of the event and maintain an event log of all actions and communications. Provide updates to EEM and LDC Provide SitRep to EEM.	Escalate EAP in consultation with EEM Notify EEM and LDC WARNING to PAR to EVACUATE. Monitor regional and local weather conditions. Record data of the event and maintain an event log of all actions and communications. Provide SitRep to EEM.	De activate EAP in consultation with EEM Notify EEM, LDC and PAR that event is over. Request DIO to unlock gate if RWL is less than EL 297.6m and DIO assesses the site is safe for public access. Request approval from EEM to change the website that dam is open. Recommend DIO recommence weekly inspections if safe to do so. Debrief with EEM and other DoR staff as appropriate.
Notifications and Warnings	EEM DIO	EEM LDC PAR SitRep	EEM LDC PAR SitRep	WARNING to PAR to EVACUATE. EEM LDC SitRep	Advise all that the event is over and update websites.

Activity Table 4 – Flood Events – EEM Emergency Actions

Activation Level	Normal Spillway Discharges SOP 14	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reservoir water level above EL 297.6m (FSL)	Reservoir water level above EL 299.0m and rising.	Reservoir water level above EL 299.5m and rising.	Reservoir water level above EL 301.0m (Historical Maximum)	Reservoir water level below EL 299.0m and falling
Actions	Provide approval to the EEC for a change in the website that dam is closed due to flooding. Notify DM.	Notify DM. Provide SitRep to DM.	Notify DM Provide SitRep to DM.	Notify DM Provide SitRep to DM.	Notify DM that the event is over. Prepare and forward EER[3], if required, to DM.
Notifications and Warnings	DM	DM SitRep	DM SitRep	DM SitRep	Advise all that the event is over. DM EER, if required.

[3] Forward EER to DDS within 30 working days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*.

Activity Table 5 – Flood Events – DM Emergency Actions

Activation Level	Normal Spillway Discharges SOP 14	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reservoir water level above EL 297.6m (FSL)	Reservoir water level above EL 299.0m and rising.	Reservoir water level above EL 299.5m and rising.	Reservoir water level above EL 301.0m (Historical Maximum)	Reservoir water level below EL 299.0m and falling
Actions	Note dam is spilling and website changed	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Notify EDTS, DDS[1], DoREM, DDGGeo, and external stakeholders (LDMG, DDMG, SDCC) that the event is over. Review EER[3] if required and forward to DDS
Notifications and Warnings	EEM	EDTS DDS DoREM DDGGeo External Stakeholders	EDTS DDS DoREM DDGGeo External Stakeholders	EDTS DDS DoREM DDGGeo External Stakeholders	EDTS DDS DoREM DDGGeo External Stakeholders

[1] Notify DDS within 48 hours of event. [3] Forward EER to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*.

Activity Table 6 – Flood Events – DIO Communications

Activation Level	Trigger for Communications	Contact Priority Order	Methods	Message Text
Normal Spillway Discharges SOP 14	Reservoir water level above (FSL) EL 297.6m	Campers EEC	Face to Face Phone Email	Advise campers to leave site. Notify EEC once campers have been removed from site and Corella Dam access gate has been locked.
Alert	Reservoir water level above EL 299.0m and rising. Updates from EEC and BoM	EEC	Phone Email	N/A
Lean Forward	Reservoir water level above EL 299.5m and rising. Updates from EEC and BoM	EEC	Phone Email	N/A
Stand Up	Reservoir water level above EL 301.0m (Historical Maximum) Updates from EEC and BoM.	EEC	Phone Email	N/A
Stand down	Reservoir level below EL 299.0m and falling Updates from EEC and BoM.	EEC	Phone Email	Notify EEC when the dam site is safe to be reopened.

Activity Table 7 – Flood Events – EEC Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method/s	Messages (subject to minor change by approval of DM)
Normal Spillway Discharges SOP 14	Reservoir water level above (FSL) EL 297.6m Updates from RSAS and BoM	EEM LDC DIO	Phone Email SMS	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Spillway Discharge STATUS: Normal Spillway Discharge – Reservoir Water Level: EL 297.6m and rising/steady/falling. ACTION: DIO to remove campers and lock the Corella Dam access gate.
Alert	Reservoir water level above EL 299.0m and rising. Updates from RSAS and BoM	EEM LDC DIO PAR	Phone SitRep Email SMS	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Flooding STATUS: ADVICE – EAP Activated. Reservoir Water Level: EL 299.0m and rising/steady. ACTION: Standby for further notifications. UPDATE: Next update due by XX am/pm
Lean Forward	Reservoir water level above EL 299.5m and rising. Updates from RSAS and BoM	PAR LDC EEM	Phone SitRep Email SMS	DEPT OF RESOURCES WATCH AND ACT DAM: Corella EVENT: Flooding STATUS: WATCH AND ACT– Reservoir Water Level: EL 299.5m and rising/steady. ACTION: Prepare for evacuation, await further notifications. UPDATE: Next update due by XX am/pm
Stand Up	Reservoir water level above EL 301.0m (Historical Maximum) Updates from RSAS and BoM	PAR LDC EEM	Phone SitRep Email SMS	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Flooding STATUS: EMERGENCY WARNING – Reservoir Water Level: EL 301.0m and rising/steady. ACTION: Evacuate PAR. UPDATE: Next update due by XX am/pm.

Stand down	Reservoir level below EL 299.0m and falling Updates from RSAS and BoM	PAR DIO LDC EEM	Phone SitRep Email SMS	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Flooding STATUS: ADVICE – Event over. Reservoir Water Level: EL 299.0m and falling. ACTION: SOP 14 until RWL 297.6m then open Dam access gate if DIO assesses that it is safe to do so.

Activity Table 8 – Flood Events – EEM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Normal Spillway Discharges SOP 14	Reservoir water level above (FSL) EL 297.6m. Updates from RSAS and BoM	DM	Email	Approve request from EEC to change website that the dam is closed.
Alert	Reservoir water level above EL 299.0m and rising. Updates from RSAS and BoM	DM	Phone SitRep Email	Internal SitReps are prepared by the EEM as required to suit the circumstances of individual dam hazard events or dam emergency events. These SitReps will be distributed by Email to the DM. Refer to SitRep template in Section 1.12.1.
Lean Forward	Reservoir water level above EL 299.5m and rising. Updates from RSAS and BoM	DM	Phone SitRep Email	
Stand Up	Reservoir water level above EL 301.0m (Historical Maximum) Updates from RSAS and BoM	DM	Phone SitRep Email	
Stand Down	Reservoir water level below EL 299.0m and falling Updates from RSAS and BoM	DM	Phone SitRep Email	

Activity Table 9 – Flood Events – DM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Normal Spillway Discharges SOP 14	Reservoir water level above (FSL) EL 297.6m Updates from RSAS and BoM			
Alert	Reservoir water level above EL 299.0m and rising. Updates from RSAS and BoM	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SitRep Email	External SitReps are escalated by the DM as required to suit the circumstances including a summary dam(s) event status, hazards and required actions. These SitReps will be distributed by Email to the EMT and Resources Senior Management. Refer to SitRep template in Section 1.12.1.
Lean Forward	Reservoir water level above EL 299.5m and rising. Updates from RSAS and BoM	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SitRep Email	
Stand up	Reservoir water level above EL 301.0m (Historical Maximum) Updates from RSAS and BoM	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SitRep Email	
Stand down	Reservoir water level below EL 299.0m and falling Updates from RSAS and BoM	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SitRep Email	

[4] External Stakeholders include LDMG, DDMG, SDCC

5.2 Structural Issues / Sunny Day Failure

5.2.1 Structural Issues

Concerns may arise if the structural stability of the dam structure and/or its ancillary works are compromised. Dam safety issues may include:

Accessibility to the dam may be impeded by flood waters;

Tourists or other personnel may be isolated by flood waters;

Increasing rates of seepage or development of new seepage areas;

Cracks or breakage to the Gunite slab on upstream face of embankment

Embankment instability;

Displacement of the embankment;

Cracking of the embankment (either transverse cracking or longitudinal cracks); and

Development of seepage at the dam's downstream toe or through the dam abutments.

If the embankment is breached (considered to have failed), it is expected that the breach will increase in size with a corresponding increase in water discharges through the breach until such time as the reservoir level drains down.

It is unlikely that if a dam safety issue is identified at Corella Dam that it will be possible to undertake any repairs or mitigation during the event to arrest the issue from developing or to slow its development.

5.2.2 Sunny Day Failure

A "Sunny Day" failure is defined as failure of the dam and the release of water downstream, when there is low or no inflow to the dam from rainfall events or there is no inclement weather occurring. This type of dam failure is unexpected and can occur with little or no warning.

A "Sunny Day" failure may be a result of any or a combination of the following:

Distress in the embankment including cracking or deformation;

Abnormal instrument readings (piezometers indicating higher pressures);

An Earthquake event (which damages the dam embankment);

Differential movement or settlement;

Cracking or displacement of the dam's concrete face;

Increasing rates of seepage or development of new seepage paths;

A sunny day failure may develop over time with the initial evidence being an increased rate of seepage, noticeable cracks or displacement in the concrete facing of the dam, movement or slumping of the downstream rock embankment and the flow of water through the cracks. It is however difficult to determine a precise timing for a dam safety issue to develop to the point where failure of the dam occurs. Any response to dam safety issues under these circumstances should be taken early in the event rather than waiting for the dam to fail or for flood flows to commence.

Corella Dam has no outlet works or low-level release infrastructure that permits the dam's water level to be lowered. In the event of a "Sunny Day" dam structural issue developing, the reservoir level would continue to be monitored.

Activity Table 10 – Structural/Sunny Day Failure – DIO Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Increasing leakage through an embankment, the foundations or abutments.	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	Structural condition has been established.	Failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create dam failure hazard.	Risk Assessment has determined that structural risk has reduced.
Actions	Notify EEC Advise campers to leave the site, lock Corella Dam access gate and display road closed sign. Monitor flows every 6 hours (or as instructed by EEC) until a decreasing trend is observable or as directed by EEC. Maintain photographic record. Record data of the event and maintain an event log of all actions and communications. Log Book entry.	As per previous activation level.	As per previous activation level, plus: Support/ supervise remedial works as required. Lower the storage as directed by EEC. Maintain surveillance of the area immediately downstream. Logbook entry.	As per previous activation level.	Prepare and forward EER including photos to EEC. Dam Logbook is to be updated after every Emergency Event. Return to routine activities and weekly inspections if safe to do so. Logbook entry Unlock the gate on Corella Dam access road and remove road closed sign when RWL is below EL 297.6m and notify EEC.
Notifications	ECC Campers	EEC	EEC	EEC	EEC

Activity Table 11 – Structural/Sunny Day Failure – EEC Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Increasing leakage through an embankment, the foundations or abutments.	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	Structural condition has been established.	Failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create dam failure hazard.	Risk Assessment has determined that structural risk has reduced.
Actions	Notify EEM, LDC, DIO that EAP is activated. Provide SitRep to EEM. Request approval from EEM to change website that dam is closed. Notify PAR.	Activate EAP in consultation with EEM. Notify EEM, LDC, PAR, DIO, RDSWU Investigate options to lower the reservoir water level to minimise the risk to PAR Investigate availability of machinery and materials (if sufficient stockpiles available). Place machinery operators on standby. Provide SitRep to EEM.	Escalate EAP in consultation with EEM. As per previous activation level.	Escalate EAP in consultation with EEM. As per previous activation level, plus: Notify EEM WARNING to PAR to EVACUATE WARNING to LDC Notify RDSWU, DIO Provide SitRep to EEM	Deactivate EAP in consultation with EEM. Notify EEM, LDC, PAR, DIO and RDSWU that the event is over. Request approval from EEM to change website that dam is open.
Notifications and Warnings	EEM LDC DIO PAR	EEM LDC PAR DIO RDSWU	EEM LDC PAR RDSWU DIO	EEM LDC PAR RDSWU DIO	EEM LDC PAR RDSWU DIO

Activity Table 12 – Structural/Sunny Day Failure – DE Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Increasing leakage through an embankment, the foundations or abutments.	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	Structural condition has been established.	Failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create dam failure hazard.	Risk Assessment has determined that structural risk has reduced.
Actions	None	Conduct inspection of the dam if requested by EEC and safe to do so Report findings to EEC immediately after inspection Prepare report including any observations, photographs, sketches or data collected during inspection and provide to EEC	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk Prepare and forward event report including any observations, photos data and sketches collected to EEC
Notifications and Warnings	None	EEC	EEC EEM	EEC EEM	EEC EEM

Activity Table 13 – Structural/Sunny Day Failure – EEM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Increasing leakage through an embankment, the foundations or abutments.	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	Structural condition has been established.	Failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create dam failure hazard.	Risk Assessment has determined that structural risk has reduced.
Actions	Notify DM Provide SitRep to DM Approval to EEC to change website that dam is closed.	Update DM Direct EEC to investigate options to lower the reservoir level to minimise the risk to PAR. Direct EEC to investigate availability of machinery and materials. Direct EEC to place machinery operators on standby. Provide SitRep to DM.	As per previous activation level. Provide SitRep to DM.	As per previous activation level Notify DM. Provide SitRep to DM.	Approve EEC request to change website that dam is open. Notify DM that the event is over. Prepare and forward EER[3], if required to DM.
Notifications and Warnings	DM SitRep	DM SitRep	DM SitRep	DM SitRep	DM SitRep

[3] Forward EER to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 14 – Structural/Sunny Day Failure – DM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Increasing leakage through an embankment, the foundations or abutments.	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	Structural condition has been established.	Failure in progress or likely due to structural damage; **and** Sufficient water in reservoir to create dam failure hazard.	Risk Assessment has determined that structural risk has reduced.
Actions	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC) Review EER[3], if required, and forward to DDS.
Notifications and Warnings	EDTS DDS DoREM DDGGeo External Stakeholders EEM	EDTS DDS DoREM DDGGeo External Stakeholders	EDTS DDS DoREM DDGGeo External Stakeholders	EDTS DDS DoREM DDGGeo External Stakeholders	EDTS DDS DoREM DDGGeo External Stakeholders EEM

[1] Notify DDS within 48 hours of event [3] Forward EER to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 15 – Structural/Sunny Day Failure – DIO Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	Increasing leakage through an embankment, the foundations or abutments.	EEC Campers	Phone Face to face	Possible Structural Damage – not confirmed ALERT Reservoir Water level: XXX.XXm AHD UPDATE: Next update due by XX am/pm *(Subject to minor change by approval DM)*
Lean Forward	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	EEC	Phone	Unconfirmed leakage under investigation LEAN FORWARD Reservoir Water level: XXX.XX AHD UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
Stand Up 1	Structural damage has been established.	EEC	Phone	Confirmed structural leakage STAND UP Reservoir Water level: XXX.XX AHD UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
Stand Up 2	Failure in progress or likely due to structural damage, **and** Sufficient water in storage to create a dam failure hazard.	EEC	Phone	Possible dam failure confirmed STAND UP Reservoir Water level: XXX.XX AHD UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
	Dam failure in progress.	EEC	Phone	Dam Failure in progress ACTION: Move PAR to higher ground. UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
Stand Down	Risk Assessment has determined that structural risk has reduced.	EEC	Phone	STAND DOWN Reservoir Water level: XXX.XXm AHD ACTION: Stand Down *(Subject to minor change by approval DM)*

Activity Table 16 – Structural/Sunny Day Failure – EEC Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Increasing leakage through an embankment, the foundations or abutments.	EEM LDC DIO PAR	Phone SMS Email SitRep	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Structural Concerns STATUS: ADVICE – EAP Activated. Possible structural leakage – not confirmed. Investigations underway. Reservoir Water Level: EL XXX.XX m. ACTION: Standby for further notifications. UPDATE: Next update due by XX am/pm
Lean Forward	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	EEM LDC PAR DIO	Phone SMS Email SitRep	DEPT OF RESOURCES WATCH AND ACT DAM: Corella EVENT: Structural Concerns STATUS: WATCH AND ACT – Investigations continuing. Reservoir Water Level: EL XXX.XX m. ACTION: Standby for further notifications. UPDATE: Next update due by XX am/pm
	Increasing leakage through an embankment, the foundations or abutments with cloudy water. EAP Activated.	EEM LDC PAR DIO	Phone SMS Email SitRep	DEPT OF RESOURCES WATCH AND ACT DAM: Corella EVENT: Structural Concerns STATUS: WATCH AND ACT – Investigations continuing. Reservoir Water Level: EL XXX.XX m. ACTION: LDMG to standby for further notifications. UPDATE: Next update due by XX am/pm
Stand Up 1	Structural damage has been established.	EEM LDC PAR DIO	Phone SMS Email SitRep	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Structural Concerns STATUS: EMERGENCY WARNING – Confirmed structural leakage. Reservoir Water Level: EL XXX.XX m. ACTION: Prepare for evacuation. Follow instructions from emergency services. UPDATE: Next update due by XX am/pm

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Stand Up 2	Failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create a dam failure hazard.	EEM LDC PAR DIO RDSWU	Phone SMS Email SitRep	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Structural Concerns STATUS: EMERGENCY WARNING – Dam failure possible. Reservoir Water Level: EL XXX.XX m. ACTION: LDMG to coordinate evacuation of affected downstream residents and move people to higher ground. UPDATE: Next update due by XX am/pm
	Dam failure in progress.	EEM LDC PAR DIO RDSWU	Phone SMS Email SitRep	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Structural Concerns STATUS: EMERGENCY WARNING – Dam failure in progress. ACTION: Advise PAR to move to higher ground. UPDATE: Next update due by XX am/pm
Stand Down	Risk Assessment has determined that structural risk has reduced.	EEM LDC PAR DIO	Phone SMS Email SitRep	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Structural Concerns STATUS: ADVICE – Event over. ACTION: Stand Down

Activity Table 17 – Structural/Sunny Day Failure – DE Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	No actions required by DE at this stage			
Lean Forward	Request from EEC for inspection of dam	EEC	Phone	N/A
		EEC	Report	N/A
Stand Up 1	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC	Phone	N/A
		EEM	Phone	N/A
Stand Up 2	Dam failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create a dam failure hazard.	EEC	Phone	N/A
	Dam failure in progress.	EEM	Phone	N/A
Stand Down	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC	Phone	N/A
		EEM	Phone	N/A

Activity Table 18 – Structural/Sunny Day Failure – EEM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Increasing leakage through an embankment, the foundations or Abutments.	DM	Phone SMS SitRep Email	Internal SitReps are prepared by the EEM as required to suit the circumstances of individual dam hazard events or dam emergency events. These SitReps will be distributed by Email to the DM. Refer to SitRep template in Section 1.12.1.
Lean Forward	Increasing leakage through an embankment, the foundations or abutments with cloudy water.	DM	Phone SMS SitRep Email	
	Further increase in leakage through an embankment, the foundations or abutments with cloudy water. EAP Activated.	DM	Phone SMS SitRep Email	
Stand Up 1	Structural damage has been established.	DM	Phone SMS Sitrep Email	
Stand Up 2	Dam failure in progress or likely due to structural damage, **and** Sufficient water in reservoir to create a dam failure hazard.	DM	Phone SMS SitRep Email	
	Dam failure in progress.	DM	Phone SMS SitRep Email	
Stand Down	Risk Assessment has determined that structural risk has reduced.	DM	Phone SMS SitRep Email	

Activity Table 19 – Structural/Sunny Day Failure – DM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Increasing leakage through an embankment, the foundations or abutments.	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SMS Email SitRep	External SitReps are escalated by the DM as required to suit the circumstances including a summary dam(s) event status, hazards and required actions. These SitReps will be distributed by Email to the EMT and Resources Senior Management. Refer to SitRep template in Section 1.12.1.
Lean Forward	Increasing leakage through an embankment, the foundations or abutments with cloudy water. EAP Activated.	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SMS Email SitRep	
	Update.	SitRep	Email	
Stand Up1	Structural damage has been established.	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SMS Email SitRep	
Stand Up 2	Failure in progress or likely due to structural damage, **and** Sufficient water in reservoir create a dam failure hazard.	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SMS Email SitRep	
	Dam failure in progress.	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SMS Email SitRep	

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Stand Down	Risk Assessment has determined that structural risk has reduced.	EDTS DDS DoREM DDGGeo External Stakeholders[4]	Phone SMS Email	

[4] External Stakeholders include LDMG, DDMG, SDCC

5.3 Chemical/Toxic Spill Event

5.3.1 Contamination in the Reservoir

The discharge of a chemical/toxic spill into Corella Dam reservoir or its catchment may have an impact on the campers and visitors to Corella Dam and upstream and downstream riparian water users.

Contamination may occur by either biological processes in the water reservoir itself or by chemical/toxic pollution from incidents/activities in the Corella Dam catchment.

5.3.2 Biological Contamination

Biological events within the Corella Dam water reservoir itself can result in its contamination. These events include blue-green algae blooms or a high level of microscopic pathogens such as cryptosporidium and giardia.

After long periods of low inflow, oxygen depletion can cause fish kills, polluting the water reservoir as the fish decay.

5.3.3 Toxic Inflows into the Reservoir

Contamination from chemical/toxic inflows could be from spill incidents or on-going leachate seepage from current or past activities in Corella Dam catchment.

5.3.4 Reservoir Level

During periods of dry weather, with no discharge from Corella Dam, any water contamination will be fully contained within the impounded water of Corella Dam.

In the event that contamination takes place during a period when water is discharging through the spillway, any toxicity is likely to be diluted and have less of an impact.

Activity Table 20 – Chemical / Toxic Spill – DIO Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reports of contamination or potential contamination in the reservoir/catchment area.	Not Applicable.	Confirmation of, or high probability of, a large amount of chemical spill/toxic conditions found in the reservoir/catchment.	Risk Assessment that risk has reduced. Confirmation that significant. contamination has not occurred All clear WQ test result.
Actions	Notify EEC Advise campers to leave the site, lock the Corella Dam access road gate and display road closed sign at gate. Undertake investigations to ascertain the accuracy and detail of any reports. Sketch, measure, photograph and locate its position in the reservoir/catchment. Logbook entry	Not Applicable.	Notify EEC. Contact Police 000 Update Blue Green Algae warning sign indicator if relevant Collect water samples if directed by DoR.	Notify EEC Prepare and forward EER, including photographs and sketches, to EEC. Logbook entry. Unlock the Corella Dam access gate and remove the road closed sign. Return to routine activities and weekly inspections if safe to do so, in consultation with EEC.
Notifications	EEC Campers	Not Applicable.	EEC Police	EEC

Activity Table 21 – Chemical / Toxic Spill – EEC Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reports of contamination or potential contamination in the reservoir/catchment area.	Not Applicable.	Confirmation of, or high probability of, a large amount of chemical spill/toxic conditions found in the reservoir/catchment.	Risk Assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.
Actions	Activate EAP in consultation with EEM. Notify EEM, LDC, PAR, RDSWU, DIO Record data of the event and maintain an event log of all actions and communications Request approval from EEM to change website that dam is closed.	Not Applicable.	Escalate EAP in consultation with EEM. Notify EEM, LDC, PAR, DIO WARNING to RDSWU not to use the water and that supply is cut off until further notice. Record data of the event and maintain an event log of all actions and communications	Deactivate EAP in consultation with EEM. Notify EEM, LDC and RDSWU that the event is over. Request approval from EEM to change website that dam is open.
Notifications and Warnings	EEM LDC PAR RDSWU DIO	Not Applicable.	EEM LDC PAR RDSWU DIO	EEM LDC PAR RDSWU DIO

Activity Table 22 – Chemical / Toxic Spill – EEM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reports of contamination or potential contamination in the reservoir/catchment area.	Not Applicable	Confirmation of, or high probability of, a large amount of chemical spill/toxic conditions found in the reservoir/catchment.	Risk Assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.
Actions	Notify DM Provide SitRep to DM. Provide approval to EEC to change website that dam is closed.	Not Applicable	Update DM. Provide SitRep to DM.	Notify DM that the event is over. Prepare and forward EER[3], if required, to DM. Provide approval to EEC to change website that dam is open.
Notifications and Warnings	DM SitRep	Not Applicable	DM SitRep	DM

[3] Forward EER to DDS within 30 working days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*.

Activity Table 23 – Chemical / Toxic Spill – DM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up	Stand Down
Activation Trigger	Reports of contamination or potential contamination in the reservoir/catchment area.	Not Applicable.	Confirmation of, or high probability of, a large amount of chemical spill/toxic conditions found in the reservoir/catchment.	Risk Assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.
Actions	Notify EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Not Applicable	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC) Review EER[3], if required, and forward to DDS.
Notifications and Warnings	EDTS DDS DoREM DDGGeo External stakeholders	None	EDTS DDS DoREM DDGGeo External stakeholders	EDTS DDS DoREM DDGGeo External stakeholders

[1] Notify DDS within 48 hours of event [3] Forward EER to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 24 – Chemical / Toxic Spill – DIO Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	Reports of contamination or potential contamination in the reservoir/catchment area.	EEC	Phone	CORELLA DAM POSSIBLE CHEMICAL SPILL INVESTIGATION UNDER WAY UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
		Campers	Face to Face Phone	Possible Chemical Spill – Stand By DO NOT USE WATER
Lean Forward	Not applicable			
Stand Up	Confirmation of or high probability of a large amount of Chemical spill/toxic conditions found in the storage/catchment.	EEC	Phone	WATER SUPPLY CONTAMINATION UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
		Campers	Face to Face	WATER SUPPLY CONTAMINATION Water contamination likely - leave the site. Lock the Corella Dam access gate and display dam closed sign. Avoid use or contact with water. *(Subject to minor change by approval DM)*
Stand Down	Risk Assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.	EEC Campers	Phone Face to Face	WATER SAFE TO USE Prepare report for EEM with number of PAR evacuated, where to etc. and other relevant information. Open gate, remove dam closed sign if safe to do so. *(Subject to minor change by approval DM)*

Activity Table 25 – Chemical / Toxic Spill – EEC Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Reports of contamination or potential contamination in the reservoir/catchment area.	EEM LDC RDSWU	Phone SMS SitRep Email	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Chemical Spill/Water Supply Contamination STATUS: ADVICE – Potential contamination reported. Investigation underway. ACTION: Do not use water. Standby for further notifications. UPDATE: Next update due by XX am/pm
Lean Forward	Not applicable			
Stand Up	Confirmation of or high probability of a large amount of Chemical spill/toxic conditions found in the storage/catchment.	EEM LDC RDSWU	Phone SMS SitRep Email	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Chemical Spill/Water Supply Contamination STATUS: EMERGENCY WARNING – Confirmation/high probability of water supply contamination. ACTION: Avoid use or contact with water. Standby for further notifications. UPDATE: Next update due by XX am/pm
Stand Down	Risk Assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.	EEM LDC RDSWU	Phone SMS SitRep Email	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Chemical Spill/Water Supply Contamination STATUS: ADVICE – Event over. ACTION: No contamination detected.

Activity Table 26 – Chemical / Toxic Spill – EEM Communication

Activation Level	Trigger for Communications	Group to Contact	Method	Messages (subject to minor change by approval of DM)
Alert	Reports of contamination or potential contamination in the reservoir/catchment area.	DM	Phone Email/SitRep	Internal SitReps are prepared by the EEM as required to suit the circumstances of individual dam hazard events or dam emergency events. These SitReps will be distributed by Email to the DM. Refer to SitRep template in Section 1.12.1.
Lean Forward	Not applicable			
Stand Up	Confirmation of or high probability of a large amount of Chemical Spill/Toxic Conditions found in the storage/catchment. EAP activated.	DM	Phone Email/SitRep	Internal SitReps are prepared by the EEM as required to suit the circumstances of individual dam hazard events or dam emergency events. These SitReps will be distributed by Email to the DM. Refer to SitRep template in Section 1.12.1.
Stand Down	Risk assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.	DM	Phone Email/SitRep	

Activity Table 27 – Chemical / Toxic Spill – DM Communication

Activation Level	Trigger for Communications	Group to Contact	Method	Messages (subject to minor change by approval of DM)
Alert	Reports of contamination or potential contamination in the reservoir/catchment area.	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone Email/SitRep	External SitReps are escalated by the DM as required to suit the circumstances including a summary dam(s) event status, hazards and required actions. These SitReps will be distributed by Email to the EMT and Resources Senior Management. Refer to SitRep template in Section 1.12.1.
Lean Forward	Not applicable			
Stand Up	Confirmation of or high probability of a large amount of contaminant found in the reservoir/catchment.	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone Email/SitRep	External SitReps are escalated by the DM as required to suit the circumstances including a summary dam(s) event status, hazards and required actions. These SitReps will be distributed by Email to the EMT and Resources Senior Management. Refer to SitRep template in Section 1.12.1.
Stand Down	Risk assessment that risk has reduced. Confirmation that significant contamination has not occurred. All clear WQ test result.	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone Email/SitRep	

[4] External Stakeholders include LDMG, DDMG, SDCC

5.4 Terrorist Threat or High Energy Impact

5.4.1 Sabotage or Vandalism

There is infrastructure located at Corella Dam that may be the target of sabotage or vandalism. This infrastructure includes:

Corella Dam embankment;

Security fences;

Remote monitoring systems.

Any sabotage or vandalism actions that are identified should be treated as serious and the following actions are recommended:

Immediately report the incident to Emergency Event Manager (EEM);

Take photographs of the damage or incident;

Barricade the area to enable the incident site to be inspected and investigated;

Report the incident to Police; and

Conduct a dam safety inspection to confirm if the incident has caused other damage to the dam.

Activity Table 28 – Terrorist Threat or High Energy Impact – DIO Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Down
Activation Trigger	Not Applicable.		THREAT Possible terrorist activity/suspicions noticed at the dam. 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 reservoir to create a dam failure hazard.	Risk Assessment has determined that failure risk has reduced, and Advice from QPS has been received.
Actions	Not Applicable.		Notify EEC. Inspect dam with police (if safe to do so) and in consultation with EEC and ensure all security measures in place. Instruct campers to leave the site, lock the Corella Dam access gate and display road closed sign on gate. Maintain photo record. Logbook entry. If police appoint incident manager support and follow instructions.	As per previous activation level, plus Undertake surveillance, inspect dam with Police and in consultation with EEC (if safe to do so).	As per previous activation level, plus Lower the storage level if requested by EEC. Logbook entry.	Prepare and forward EER including photos to EEM. Dam Logbook is to be updated after every Emergency Event. Return to routine activities and weekly inspections if safe to do so, in consultation with EEC.
Notifications	Not Applicable.		EEC Campers	EEC Campers	EEC Campers	EEC

Activity Table 29 – Terrorist Threat or High Energy Impact – EEC Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Down
Activation Trigger	Not Applicable		THREAT Possible terrorist activity/suspicions noticed at the dam. 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 reservoir to create a dam failure hazard.	Risk Assessment has determined that failure risk has reduced, and Advice from QPS has been received.
Actions	Not Applicable		Activate EAP in consultation with EEM. Notify EEM, LDC, PAR, RDSWU, DIO. Provide SitRep to EEM If police appoint incident manager support and follow instructions. Monitor situation and assess risks.	Activate EAP in consultation with EEM. As per previous activation level. Update EEM, LDC, PAR, RDSWU, DIO Provide SitRep to EEM	Escalate EAP in consultation with EEM. As per previous activation level Update EEM and LDC WARNING to PAR to evacuate. Update RDSWU, DIO Provide SitRep to EEM.	Deactivate EAP in consultation with EEM. Notify EEM, LDC, PAR, RDSWU, DIO that the event is over. Provide SitRep to EEM
Notifications and Warnings	Not Applicable		National Security Hotline Police Link or Police on 000 EEM LDC PAR RDSWU DIO	Police Link or Police on 000 EEM LDC PAR RDSWU DIO	Police on 000 EEM LDC PAR RDSWU DIO	National Security Hotline Police Link or Police on 000 EEM LDC PAR RDSWU DIO

Activity Table 30 – Terrorist Threat or High Energy Impact – DE Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Down
Activation Trigger	Not Applicable		THREAT Possible terrorist activity/suspicions noticed at the dam. 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 reservoir to create a dam failure hazard.	Risk Assessment has determined that failure risk has reduced, and Advice from QPS has been received.
Actions	None		None	Conduct inspection of the dam if requested by EEC and safe to do so Report findings to EEC immediately after inspection Prepare report including any observations, photographs, sketches or data collected during inspection and provide to EEC	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk Prepare and forward event report including any observations, photos data and sketches collected to EEC
Notifications and Warnings	None		None	EEC	EEC EEM	EEC EEM

Activity Table 31 – Terrorist Threat or High Energy Impact – EEM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Down
Activation Trigger	Not Applicable		THREAT Possible terrorist activity/suspicions noticed at the dam. 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 reservoir to create a dam failure hazard.	Risk Assessment has determined that failure risk has reduced, and Advice from QPS has been received.
Actions	None		Notify DM Provide SitRep to DM. If police appoint incident manager support and follow instructions. Monitor situation and assess risks.	As per previous activation level, plus: Update DM. Provide SitRep to DM.	As per previous activation level, plus: Update DM. Provide SitRep to DM.	Notify DM that the event is over. Prepare and forward EER[3], if required, to DM.
Notifications and Warnings	None		DM	DM	DM	DM

[3] Forward event Report to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 32 – Terrorist Threat or High Energy Impact – DM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Up 3	Stand Down
Activation Trigger	Not Applicable		THREAT Possible terrorist activity/suspicions noticed at the dam. 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 reservoir to create a dam failure hazard.	Risk Assessment has determined that failure risk has reduced, and Advice from QPS has been received.
Actions	None		Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC) advising the event is over. Review EER[3], if required and forward to DDS.
Notifications and Warnings	None		EDTS DDS DoREM DDGGeo External stakeholders	EDTS DDS DoREM DDGGeo External stakeholders	EDTS DDS DoREM DDGGeo External stakeholders	EDTS DDS DoREM DDGGeo External stakeholders

[1] Notify DDS within 48 hours of event [3] Forward event Report to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 33 – Terrorist Threat or High Energy Impact – DIO Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	Not applicable			
Lean Forward	Not applicable			
Stand Up 1	THREAT Possible terrorist activity/suspicions noticed at the dam Threat received	EEC	Phone	RECEIVED/NOTED TERRORIST THREAT UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
Stand Up 2	EVENT Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	EEC	Phone	LARGE EXPLOSION HEARD/OBSERVED AT DAM ACTION: Prepare for possible evacuation. Follow emergency services instruction. *(Subject to minor change by approval DM)*
Stand Up 3	EVENT Failure in progress or likely due to impact or explosion; **AND** Sufficient water in reservoir to create a dam failure hazard	EEC	Phone	URGENT: DAM SAFETY SECURITY STATUS: DAM FAILURE LIKELY ACTION: Evacuation. Follow emergency services instruction. UPDATE: Next update due by XX am/pm. *(Subject to minor change by approval DM)*
Stand Down	Risk Assessment has determined that failure risk has reduced	EEC	Phone	STAND DOWN. ACTION: Prepare report for EEM with number of PAR evacuated, where to etc. and other relevant information. *(Subject to minor change by approval DM)*

Activity Table 34 – Terrorist Threat or High Energy Impact – EEC Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Not applicable			
Lean Forward	Not applicable			
Stand Up 1	THREAT Possible terrorist activity/suspicions noticed at the dam. Threat received.	National Security Hotline Police Link/Police on 000 EEM LDC DIO PAR	Phone SMS Email	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Terrorist or High Energy Impact STATUS: EMERGENCY WARNING – Received terrorist threat. ACTION: LDMG to activate emergency response. UPDATE: Next update provided as required or at Stand Down
Stand Up 2	EVENT Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit).	Police Link/Police on 000 EEM LDC DIO PAR	Phone SMS Email	RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Terrorist or High Energy Impact STATUS: EMERGENCY WARNING – Large explosion reported at dam. ACTION: LDMG to prepare coordinated evacuation. UPDATE: Next update provided as required or at Stand Down
Stand Up 3	EVENT Failure in progress or likely due to impact or explosion; **AND** Sufficient water in reservoir to create a dam failure hazard.	Police on 000 EEM LDC DIO PAR	Phone SMS Email	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Terrorist or High Energy Impact STATUS: EMERGENCY WARNING – Dam failure possible/in progress. ACTION: Advise PAR to evacuate. UPDATE: Next update provided as required or at Stand Down
Stand Down	Risk Assessment has determined that failure risk has reduced	National Security Hotline Police Link/Police on 000 PAR LDC EEM	Phone SMS Email	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Terrorist or High Energy Impact STATUS: ADVICE – Event over. ACTION: Stand Down, contact LDMG for more details.

Activity Table 35 – Terrorist Threat or High Energy Impact – DE Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	Not applicable			
Lean Forward	Not applicable			
Stand Up 1	No actions required by DE at this stage			
Stand Up 2	Request from EEC for inspection of dam	EEC	Phone Report	N/A
Stand Up 3	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC EEM	Phone	N/A
Stand Down	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC EEM	Phone	N/A

Activity Table 36 – Terrorist Threat or High Energy Impact – EEM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Not applicable			
Lean Forward	Not applicable			
Stand Up 1	THREAT Possible terrorist activity/suspicions noticed at the dam Threat received	DM	Phone SMS Email	Internal SitReps are prepared by the EEM as required to suit the circumstances of individual dam hazard events or dam emergency events. These SitReps will be distributed by Email to the DM. Refer to SitRep template in Section 1.12.1.
Stand Up 2	EVENT Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	DM	Phone SMS Email	
Stand Up 3	EVENT Failure in progress or likely due to impact or explosion; **AND** Sufficient water in reservoir to create a dam failure hazard.	DM	Phone SMS Email	
Stand Down	Risk Assessment has determined that failure risk has reduced	DM	Phone SMS Email	

Activity Table 37 – Terrorist Threat or High Energy Impact – DM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Not applicable			
Lean Forward	Not applicable			
Stand Up 1	THREAT Possible terrorist activity/suspicions noticed at the dam Threat received EAP Activated	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email	External SitReps are escalated by the DM as required to suit the circumstances including a summary dam(s) event status, hazards and required actions. These SitReps will be distributed by Email to the EMT and Resources Senior Management. Refer to SitRep template in Section 1.12.1.
Stand Up 2	EVENT Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email	
	EVENT Large explosion heard/observed at dam (e.g. bomb explosion, aircraft hit)	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email	
Stand Up 3	Failure in progress; **AND** Sufficient water in storage to create a dam failure hazard	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email	
Stand Down	Risk Assessment has determined that failure risk has reduced	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email	

[4] External Stakeholders include LDMG, DDMG, SDCC

5.5 Earthquake

An Earthquake event in close proximity to Corella Dam could lead to the following issues:

Cracking of the embankment;

Loss or damage to the Gunite slab on the Dam embankment's upstream face;

Increased rate of seepage;

Damage to the spillway;

Instability around the upstream rim of the dam and localised land slips.

In the event of an earthquake being reported in the area the following actions are recommended:

Log into and review the readings for the dam on the Remote Sensing and Alert System (RSAS). Continue to monitor the RSAS for any changes on a regular basis (say at least 3 hourly) over the next 48 hours;

If required, arrange for a dam inspection to be undertaken as soon as possible.

Activity Table 38 – Earthquake – DIO Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	Failure possible or in progress due to earthquake	Risk assessment has determined that failure risk has reduced
Actions	Notify EEC Advise campers to leave the site, lock the Corella Dam access road gate and display road closed sign on gate. Inspect the Dam Wall, Spillway and Abutments (if safe to do so) and report to EEC Check for leaks, deformation, erosion and concrete damage Maintain photographic record Record data of the event and maintain an event log of all actions and communications Logbook entry	As per previous activation level; plus Repeat the inspection as directed. Provide inspection report to EEC.	As per previous activation level, plus Support/ supervise remedial works as required. Lower the storage if directed. Maintain surveillance of the area immediately downstream and inform any members of the public that the gate is closed. Log Book entry.	As per previous activation level.	Prepare and forward EER including photos for EEC. Dam Logbook is to be updated after every Emergency Event. Return to routine activities and weekly inspections. Removed road closed sign and unlock the Corella Dam access gate when the event is over
Notifications	EEC Campers	EEC	EEC	EEC	EEC

Activity Table 39 – Earthquake – EEC Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	Failure possible or in progress due to earthquake	Risk assessment has determined that failure risk has reduced
Actions	Activate EAP in consultation with EEM. Notify EEM, LDC, DIO. Notify PAR. Request approval from EEM to change website that dam is closed.	Escalate EAP in consultation with EEM. Notify EEM, LDC, PAR, DIO Investigate availability of machinery and materials (if sufficient stockpiles available) Place machinery operators on standby Provide SitRep to EEM	Escalate EAP in consultation with EEM As per previous activation level. Provide SitRep to EEM	Escalate EAP in consultation with EEM As per previous activation level WARNING to LDC WARNING to PAR to EVACUATE Notify RDSWU Provide SitRep to EEM	Deactivate EAP in consultation with EEM. Notify EEM, LDC, PAR, DIO that the event is over Request approval from EEM to change website that dam is open.
Notifications and Warnings	EEM LDC DIO PAR	EEM LDC PAR DIO SitRep	EEM LDC PAR DIO SitRep	EEM LDC PAR DIO RDSWU SitRep	EEM LDC PAR RDSWU DIO

Activity Table 40 – Earthquake – DE Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	Failure possible or in progress due to earthquake	Risk assessment has determined that failure risk has reduced
Actions	None	Conduct inspection of the dam if requested by EEC and safe to do so Report findings to EEC immediately after inspection Prepare report including any observations, photographs, sketches or data collected during inspection and provide to EEC	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk	Provide advice to the EEC and EEM regarding the current condition of the dam and the structural risk Prepare and forward event report including any observations, photos data and sketches collected to EEC
Notifications and Warnings	None	EEC	EEC EEM	EEC EEM	EEC

Activity Table 41 – Earthquake – EEM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	Failure possible or in progress due to earthquake	Risk assessment has determined that failure risk has reduced
Actions	Notify DM Approve request from EEC to change website that dam is closed.	Update DM. Provide SitRep to DM.	Update DM Provide SitRep to DM.	Update DM Provide SitRep to DM.	Notify DM that the event is over. Prepare and forward EER[3], if required to DM. Approve request from EEC to change website that dam is open.
Notifications and Warnings	DM	DM SitRep	DM SitRep	DM SitRep	DM

[3] Forward EER to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 42 – Earthquake – DM Emergency Actions

Activation Level	Alert	Lean Forward	Stand Up 1	Stand Up 2	Stand Down
Activation Trigger	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	Failure possible or in progress due to earthquake	Risk Assessment has determined that failure risk has reduced
Actions	None	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Provide SitRep to EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC)	Notify EDTS, DDS[1], DoREM, DDGGeo and external stakeholders (LDMG, DDMG, SDCC) that the event is over. Provide SitRep. Review EER[3], if required and forward to DDS. Approve EEM request to change website that dam is open.
Notifications and Warnings	None.	EDTS DDS DoREM DDGGEo External stakeholders	EDTS DDS DoREM DDGGEo External stakeholders	EDTS DDS DoREM DDGGeo External stakeholders	EDTS DDS DoREM DDGGeo External stakeholders

[1] Notify DDS within 48 hours of event. [3] Forward EER to DDS within 30 days of the event as specified in the *Water Supply (Safety and Reliability) Act 2008*

Activity Table 43 – Earthquake – DIO Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	Campers EEC	Face to Face Phone	Earthquake reported or felt in the area INVESTIGATION COMMENCED UPDATE: Next update due by XX am/pm.
Lean Forward	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	EEC	Phone	INVESTIGATIONS CONTINUING Reservoir Water level: XXX.XXm AHD ACTION: Stand by. UPDATE: Next update due by XX am/pm.
Stand Up 1	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	EEC	Phone	CONFIRMED – Earthquake affected dam Reservoir Water level: XXX.XXm AHD UPDATE: Next update due by XX am/pm.
Stand Up 2	Failure in progress or likely due to earthquake **AND** Sufficient water in reservoir to create a dam failure hazard.	EEC	Phone	EARTHQUAKE DAMAGE – DAM FAILURE LIKELY ACTION: Possible evacuation. Follow emergency services instructions. UPDATE: Next update due by XX am/pm.
Stand Down	Risk Assessment has determined that failure risk has reduced.	EEC	Phone	STAND DOWN Reservoir Water Level: XXX.XXm AHD Prepare report for EEM with number of PAR evacuated, where to, and other relevant information.

Activity Table 44 – Earthquake – EEC Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	EEM LDC DIO PAR	Phone SMS Email	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Earthquake STATUS: ADVICE – EAP Activated. Earthquake reported or felt in the area – unconfirmed. Reservoir Water Level: EL XXX.XX m. ACTION: Standby for further notifications. UPDATE: Next update due by XX am/pm
Lean Forward	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	EEM LDC PAR DIO	Phone SMS Email	DEPT OF RESOURCES WATCH AND ACT DAM: Corella EVENT: Earthquake STATUS: WATCH AND ACT – Earthquake confirmed. Investigations underway. Reservoir Water Level: EL XXX.XX m. ACTION: Standby for further notifications. UPDATE: Next update due by XX am/pm
Stand Up 1	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	EEM LDC PAR DIO RDSWU	Phone SMS Email	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Earthquake STATUS: EMERGENCY WARNING – Earthquake confirmed. Dam affected. Reservoir Water Level: EL XXX.XX m. ACTION: LDMG to activate emergency response. Await further advice. UPDATE: Next update due by XX am/pm

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Stand Up 2	Failure in progress or likely due to earthquake.	EEM LDC PAR DIO RDSWU	Phone SMS Email	DEPT OF RESOURCES EMERGENCY WARNING DAM: Corella EVENT: Earthquake STATUS: EMERGENCY WARNING – Dam failure possible/in progress. Reservoir Water Level: EL XXX.XX m. ACTION: Follow emergency services instructions. Move to higher ground. UPDATE: Next update due by XX am/pm
Stand Down	Risk Assessment has determined that failure risk has reduced.	EEM LDC PAR DIO RDSWU	Phone SMS Email	DEPT OF RESOURCES ADVICE DAM: Corella EVENT: Earthquake STATUS: ADVICE – Event over. ACTION: Stand Down. Contact LDMG for more details.

Activity Table 45 – Earthquake – DE Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Message Text
Alert	No actions required by DE at this stage			
Lean Forward	Request from EEC for inspection of dam	EEC	Phone Report	N/A
Stand Up 1	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC EEM	Phone	N/A
Stand Up 2	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC EEM	Phone	N/A
Stand Down	Request from EEC or EEM for advice regarding dam condition and/or structural risk	EEC EEM	Phone	N/A

Activity Table 46 – Earthquake – EEM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	DM	Phone SMS Email/SitRep	Internal SitReps are prepared by the EEM as required to suit the circumstances of individual dam hazard events or dam emergency events. These SitReps will be distributed by Email to the DM. Refer to SitRep template in Section 1.12.1.
Lean Forward	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	DM	Phone SMS Email/SitRep	
Stand Up 1	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	DM	Phone SMS Email/SitRep	
Stand Up 2	Failure in progress or likely due to earthquake.	DM	Phone SMS Email/SitRep	
Stand Down	Risk Assessment has determined that failure risk has reduced.	DM	Phone SMS Email/SitRep	

Activity Table 47 – Earthquake – DM Communication

Activation Level	Trigger for Communications	Contact Priority Order	Method	Messages (subject to minor change by approval of DM)
Alert	Earthquake reported or felt in the area **AND** Intensity less than or equal to 5MM **AND** Change detected during surveillance	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email/SitRep	External SitReps are escalated by the DM as required to suit the circumstances including a summary dam(s) event status, hazards and required actions. These SitReps will be distributed by Email to the EMT and Resources Senior Management. Refer to SitRep template in Section 1.12.1.
Lean Forward	Earthquake reported or felt in the area **AND** Intensity greater than or equal to 5MM **AND** Change detected during surveillance	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email/SitRep	
Stand Up 1	Earthquake reported or felt in the area **AND** Change detected during surveillance **AND** A possible failure path has been identified	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email/SitRep	
Stand Up 2	Failure in progress or likely due to earthquake.	EDTS DDS DoREM DDGGeo External stakeholders[4]	Phone SMS Email/SitRep	
Stand Down	Risk Assessment has determined that failure risk has reduced.	EDTS DDS DoREM DDGGD External stakeholders[4]	Phone SMS Email/SitRep	

[4] External Stakeholders include LDMG, DDMG, SDCC

Appendix 1 – Notification Lists and Contact Details

Summary of Emergency Event Contact List tables provided in Appendix 1:

Table A – Population at Risk (PAR)

Table B – Riparian Downstream Water Users

Table C – Dam Inspection Officers, RoadTek

Table D – EAP Officers, Technical Services

Table E – Dam Safety Regulator

Table F – Local Disaster Management Group

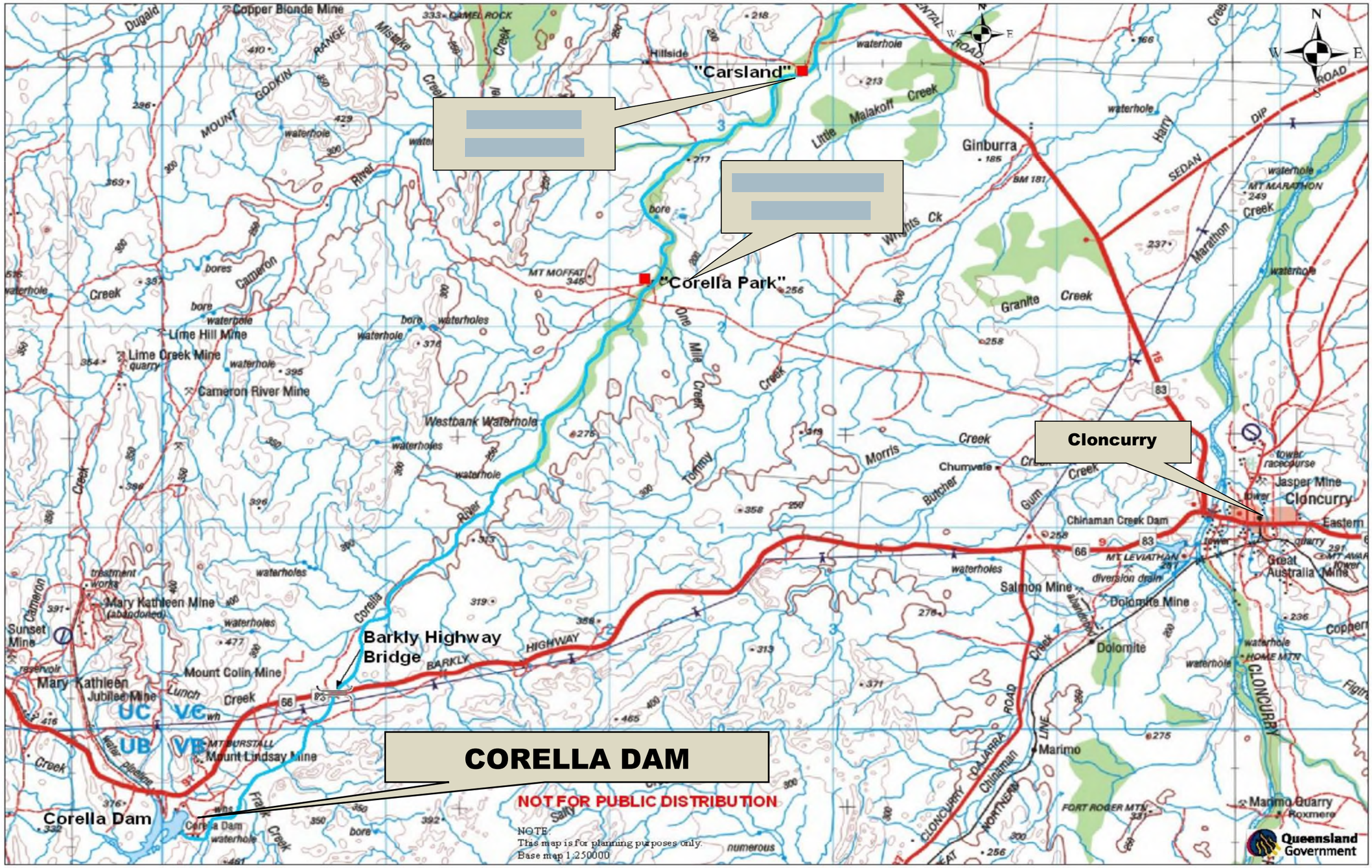
Table G – District Disaster Management Group

Table H – State Disaster Coordination Centre

Table I – Toxic Spills

Appendix 1 has been redacted

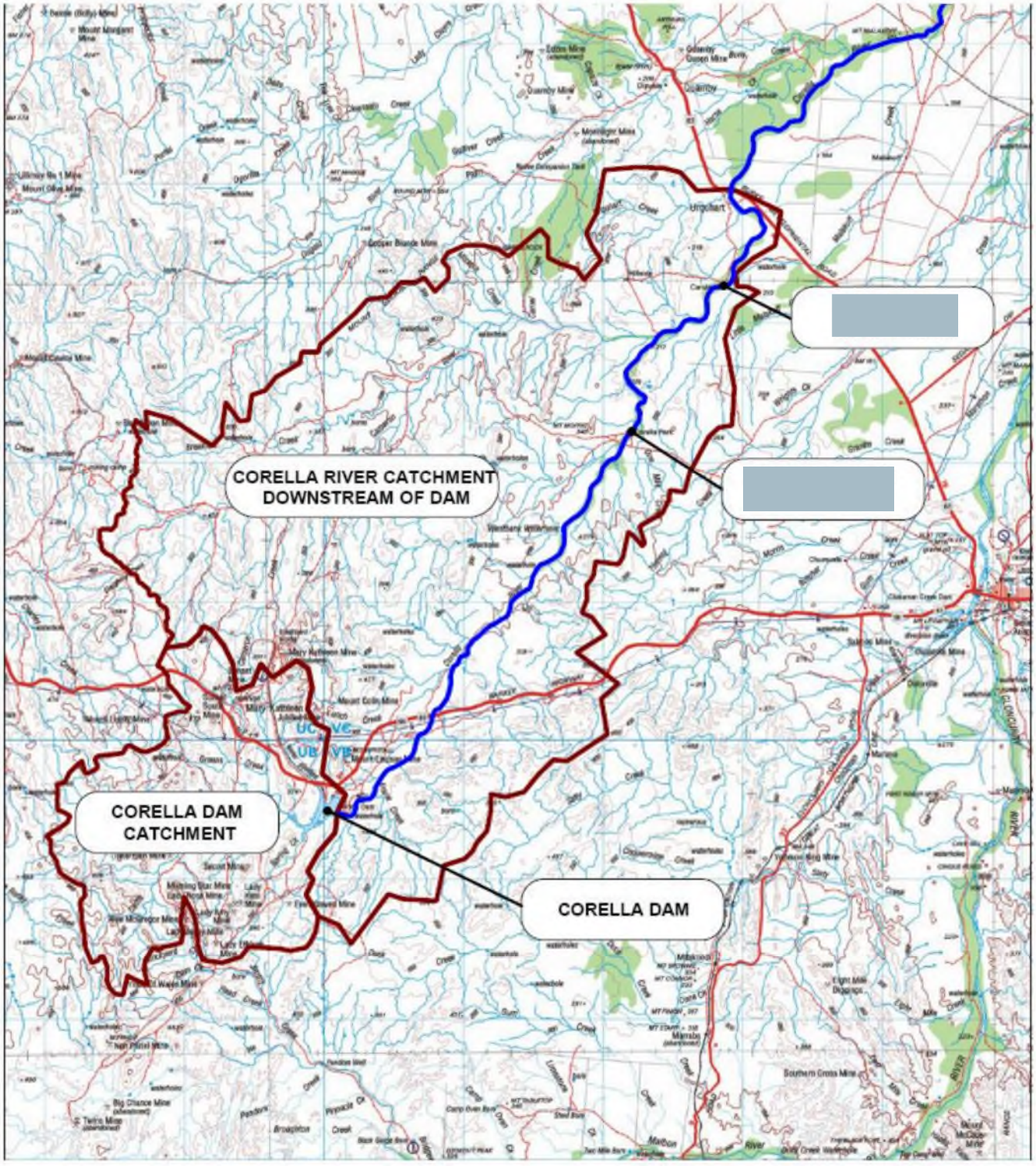
Appendix 2 – Locality Plan and Access Route



Appendix 2 – Corella Dam Locality Plan and Access Route

Appendix 3 – Catchment Boundary Plan

Appendix 3 - Corella Dam Catchment Boundary Plan



Appendix 4 – Inspection Safety Protocol

Standard Working Practice Corella Dam – Routine Work Only

All DIO who visit the dam site are to observe this protocol**:**

A handheld satellite phone with backup battery to be available at all inspections.

Inspections are to be carried out only when conditions are deemed to be safe as per inspection and risk assessment/s.

During an emergency event access to dam structure, main spillway and auxiliary emergency spillway is not to be made by boat.

Only the DIO, and people authorised by the EEM, is authorised to visit the dam site during Emergency Events.

Appendix 5 – Individual Evacuation Plan

Individual Resident Evacuation Plans

As part of the annual review of this EAP, TS staff will contact each potential at risk property and revise the evacuation plan accordingly. If there are any changes, a revised plan will be provided to the resident.

The following maps are provided below:

Corella Park Homestead, evacuation route;

Carsland Homestead, evacuation route.

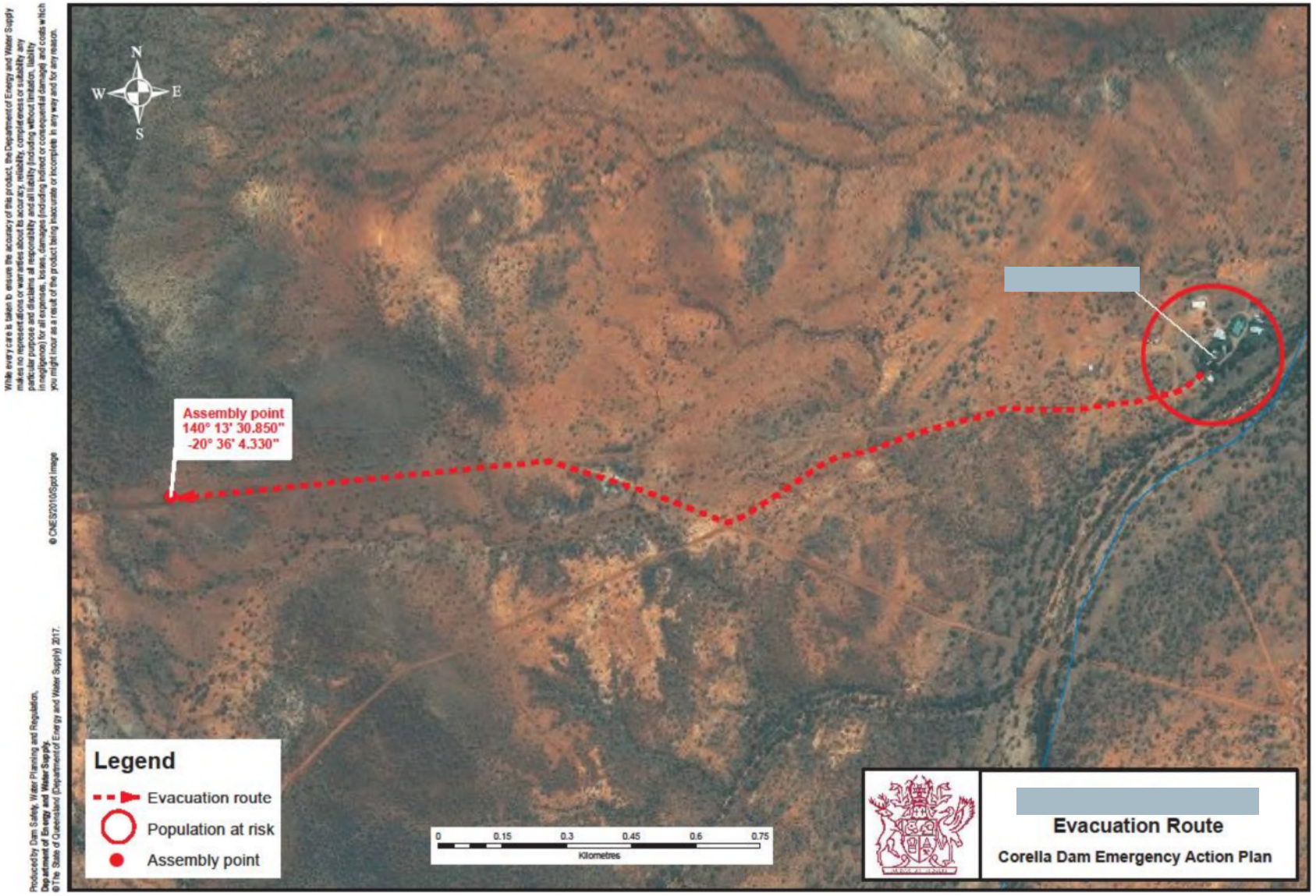


Figure 1 – Appendix 5 – *Corella Park* Homestead Evacuation Route

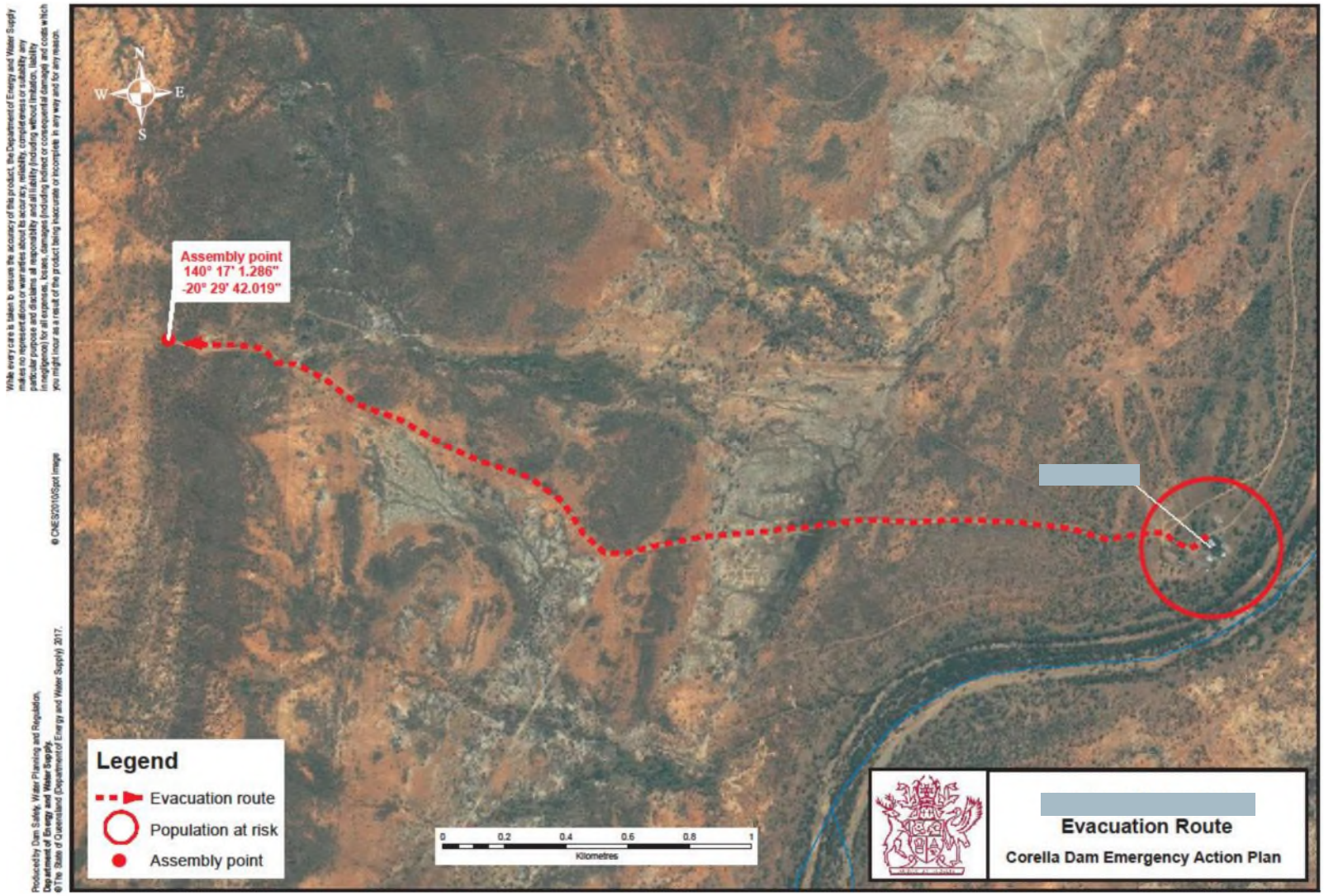


Figure 2 – Appendix 5 – *Carsland* Homestead Evacuation Route

Appendix 6 – Rainfall and Reservoir Level Information

Remote Sensing and Alert System (RSAS)

The following alarm levels have been set in the RSAS system.

Table 1 – Appendix 6 – Remote Sensing Alarm Triggers

RSAS Alarm	Normal	Alert	Lean Forward	Stand Up
Corella Reservoir Level	297.6 – 299.0m EAP Trigger SPILLWAY	299.0 to 299.5 m EAP Trigger ALERT	299.5 to 301.0 m EAP Trigger LEAN FORWARD	> 301.0 m EAP Trigger STAND UP
V-Notch	0 to 0.099m	N/A	N/A	+0.10 m above V-Notch

Note: V-notch weir readings may be affected by high rainfall events.

The information and data obtained from the RSAS can be used in the following ways to provide useful information for resources managing an emergency event, including:

Plotting of reservoir and downstream river water level rate of rise to provide a prediction of when trigger levels will be reached, spillway discharges to commence and likely timing of discharges through the auxiliary spillway;
Plotting of rainfall to identify if the storm event is still developing or has passed; and
Obtaining overall rainfall totals for the site.

In the event that an alarm level in RSAS is triggered, the system will generate SMS alerts. The alerts will be sent to the nominated DoR personnel as listed in Table 2 below Additional nominated staff can be added to receive the alerts as required.

Table 2 – Appendix 6 – DoR RSAS Notification List

Name	EAP Role	Resources Position
[redacted]	DM	Director Asset Management
[redacted]	EEM (Primary)	Central Operations Manager
[redacted]	EEM (Secondary)	Principal Engineer
[redacted]	EEC	Senior Engineer

Any person, who receives an SMS Alert for Corella Dam and who is not the EEM, shall immediately notify the EEM of the alert and if uncontactable, take the appropriate action and notify the rest of the officers on the notification list what action was/will be taken.

A site logbook is located in the main RSAS cabinet (on the dam crest). This logbook is used by Dam Operators to record their attendance at site and any observations or notes from their regular dam inspections. This site logbook is not to be confused with the incident log to record communications and actions taken during an emergency situation.

A remote camera is installed on the crest of Corella Dam to provided DoR employees with daily imagery of areas of interest. DoR may control the camera in real time to assess the current condition of the dam. The camera will allow DoR to assess the condition of the dam during escalating emergency levels to gain additional insight and disprove false RSAS alarms. The camera also enables DoR to maintain a photo log for future reference.

Bureau of Meteorology

A large amount of useful information can be obtained from the Bureau of Meteorology (BOM) web site (www.bom.gov.au) that can assist in assessing the potential rainfall and development of flood inflows to the Corella Dam reservoir. The information includes "weather radar" images (refer to the Mount Isa based radar site).

It is important to note that the information available from this site may be up to 10 minutes out of date (i.e. radar images are refreshed at intervals of approximately 10 minutes).

Other BOM rainfall gauge sites that may be useful in providing information on rainfall, including the spread of the rainfall system and whether the rainfall is uniform or otherwise across the area include:

Mount Isa
Cloncurry
Carsland

The weather stations located in the area around Corella Dam are shown on the attached map (copied from BOM web site). The catchment boundary plan is in Appendix 2.

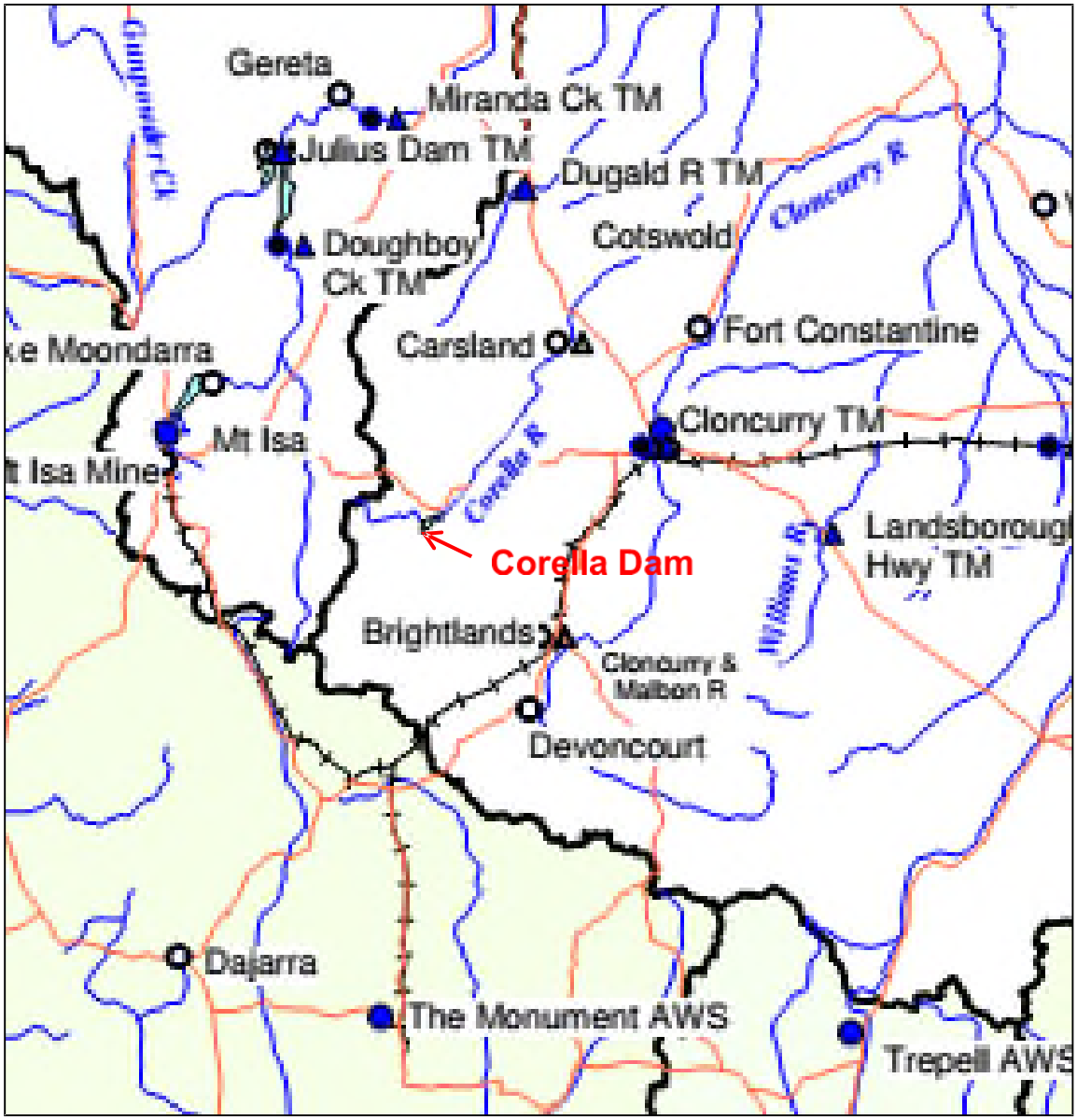


Figure 1 Appendix 6 Rain and Stream Gauging Stations in the Corella Dam Region

BoM – Radar Image of Rainfall Prediction

The BoM website provides radar images of rainfall that might be approaching the catchment area.

Go to the website: www.bom.gov.au

Left click on the Rain Radars Icon

Left click on the Mount Isa location

Left click on the 128 km icon

Ensure map features on the right hand side of the page have "Locations", "Range" and "Topography" features are selected.

Corella Dam is located east (right) of Mount Isa, approximately half way between Mount Isa in the centre of the two range circles and Cloncurry on the larger range circle, just under the" r" in "Mary Kathleen".

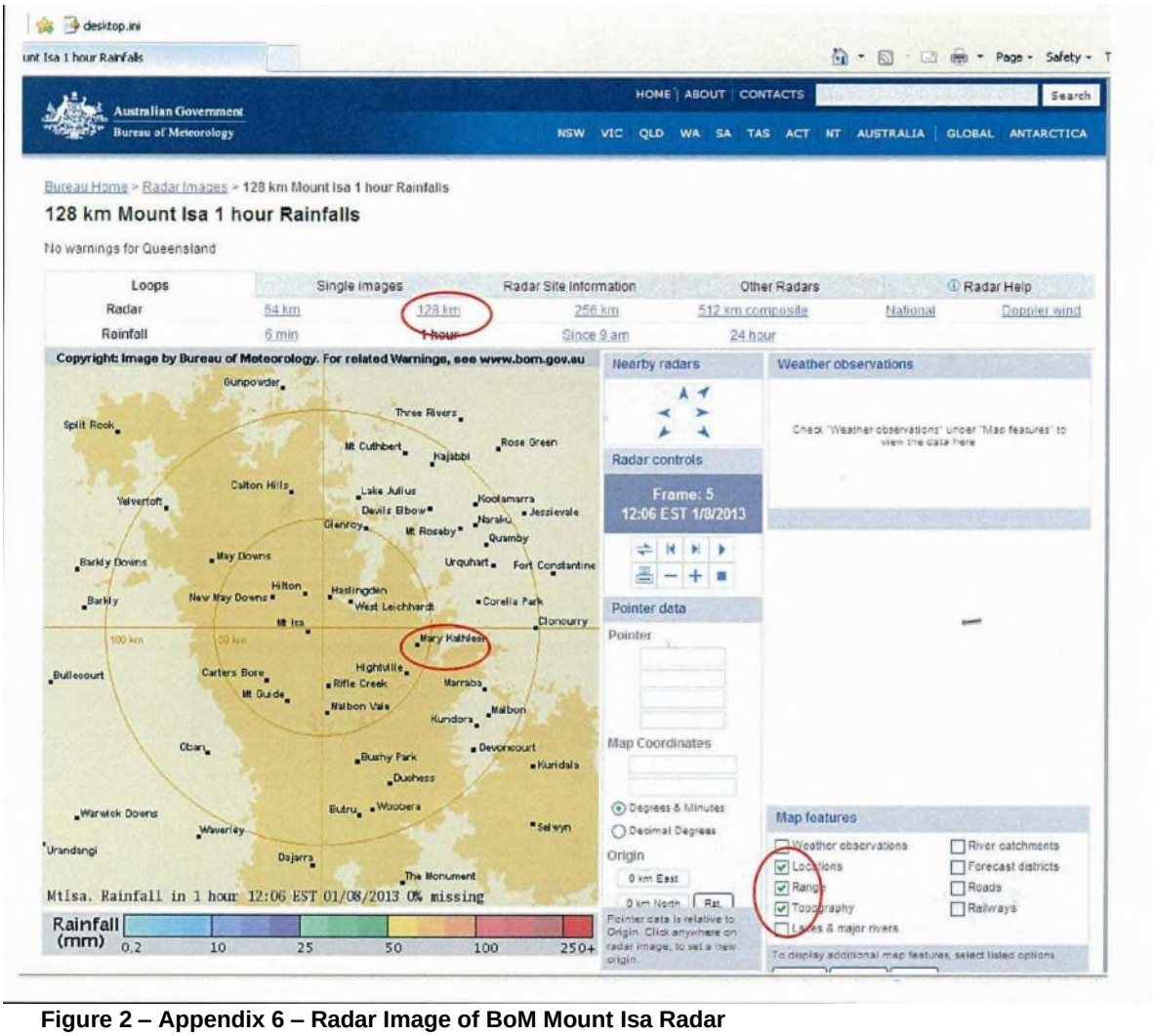


Figure 2 – Appendix 6 – Radar Image of BoM Mount Isa Radar

BoM – View Rainfall and Gauge Height Information

Detailed information is available from the Bureau website.

Go to website: www.bom.gov.au

Left Click Queensland area of the map of Australia.

Under Observations tab, Left click Latest rainfall and river conditions.

On the right hand side under Zoom in to: Left click Gulf and Peninsula.

Scroll Down to table under map and go to column displaying Latest Rainfall Data

Scroll Down to the Gilbert table, Left Click 3hr for latest rainfall.

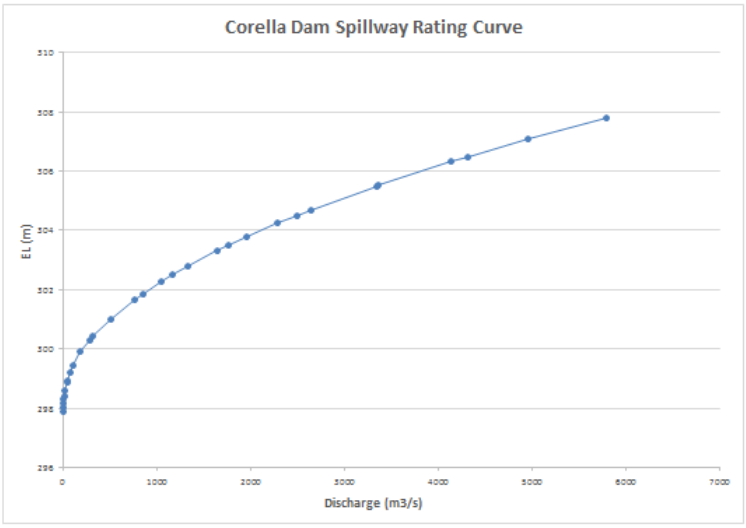
Scroll down to Flinders table, Read and record rainfall data for Cloncurry TM and Black Gorge TM.

Move to top tool bar and Left Click Back arrow

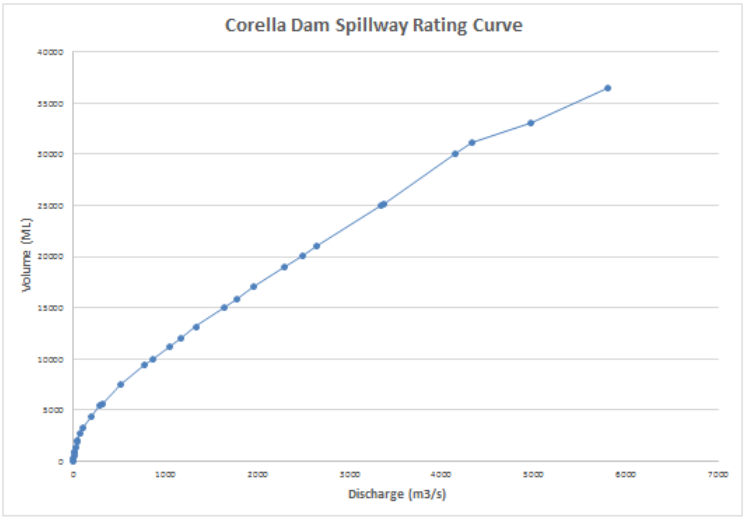
Left Click 24 hr for stations as above – re read and record rainfall data Cloncurry TM and Black Gorge TM.

Appendix 7 – Rating Tables

Height (m)	Discharge (m³/s)	
297.9	0	
298.04	2	
298.16	5	
298.29	10	
298.39	15	
298.57	25	
298.89	48	
298.92	50	
299.21	75	
299.46	105	
299.91	189	
300.31	288	
300.41	319	
301.02	511	
301.67	768	
301.86	859	
302.25	1044	
302.49	1172	
302.79	1332	
303.29	1640	
303.49	1773	
303.77	1958	
304.23	2290	
304.49	2493	
304.68	2641	
305.49	3343	
305.52	3369	
306.32	4141	
306.49	4324	
307.08	4962	
307.81	5800	
310.9	9347.151	*Extrapolated Value*



Volume (M	Discharge (m³/s)	
0	0	
275	2	
510	5	
765	10	
961	15	
1314	25	
1941	48	
2014	50	
2720	75	
3329	105	
4424	189	
5398	288	
5641	319	
7450	511	
9378	768	
9941	859	
11241	1044	
12041	1172	
13181	1332	
15081	1640	
15841	1773	
17017	1958	
18949	2290	
20041	2493	
20972	2641	
24941	3343	
25127	3369	
30087	4141	
31141	4324	
33052	4962	
36505	5800	
51000	9347.151	*Extrapolated Value*



Appendix 8 – SOP14 Small to Medium Spillway Overflows

Department of Resources

Corella Dam

Standing Operating Procedures

for

Small to Medium Spillway Overflows

SOP - 14

Table of Contents

1 Purpose

2 Scope

3 Personnel Affected and Responsibilities

4 Procedures

5 If the RSAS is Not Working or Unreliable

6 References

Appendices

Appendix A: Inspecting for Deficiencies

1 Purpose

The Corella Dam is managed by DoR. In terms of an MOU with DoR, the RoadTek Works Manager, Asset Services North, manages the operation and maintenance of Corella Dam, including routine dam safety inspections.

Part of the dam safety management program is to inspect the Dam immediately before the spillway starts to overflow. A secondary objective is to advise tourists or campers that access and egress to the area may be cut off due to local stream rises and Corella Dam access gate closed and locked if the dam site is deemed unsafe (on advice from the DIO).

2 Scope

This Procedure applies to spillway overflow events that are less than the alert trigger level of 297.6 m. The personnel are the EEC, the EEM and the DIO (RoadTek). Intel about the status of the dam is to be obtained from the RSAS and BoM website.

3 Personnel Affected and Responsibilities

Director, Asset Management, TS DoR	The person responsible for authorising/approving the Emergency Action Plan, the Standing Operating Procedures and the Operation and Maintenance Manual.
Central Operations Manager, TS (DoR)	The person responsible for approving the persons undertaking the role of Dam Inspection Officers (DIO) and, for managing, receiving, storing and checking data for the Corella Dam, reviewing and authorising documentation produced by the RoadTek Officer and consultants on the dam and initiating investigations into abnormal behaviour of the dam. Manages the Distribution, Approval and Revision Control relating to this Procedure.
Emergency Event Manager (EEM)	The DoR Emergency Event Manager.
Emergency Event Coordinator (EEC)	The DoR Emergency Event Coordinator.
Dam Inspection Officers (DIO)	The person appointed by RoadTek to operate the dam and undertake inspections.
Dam Inspection Engineer (DE)	A Registered Professional Engineer of Queensland, responsible for carrying out an inspection at the dam.

4 Procedures

The EEC is responsible for checking the dam water levels, storage height and rainfall conditions and predict when the spillway is likely to overflow. If the storage level is predicted to reach the alert level trigger EL 299.0m, the EEC is to notify the EEM. The EEC is to inform the DIO when the spillway is likely to overflow.

The DIO should be aware of the rainfall conditions in the area. Details for obtaining information on rainfall are obtainable from the BOM website – see Appendix 6 – Rainfall and Reservoir Water Level Information.

When the dam level reaches 297.6m the DIO is to go to the dam site to check whether there are visitors/campers at the dam site and advise them that the spillway is likely to overflow and they should leave the area immediately. If they are unable to leave the site because of local stream rises or other reasons they should seek higher ground above the dam crest on the left bank of the river and await evacuation by police and emergency services.

Once the visitors/campers have left the site, ensure the boom gate to the dam site is locked as well as the gate located on Corella Dam access road. A road closed sign should be displayed. The DIO will confirm with the EEC that the gate has been closed and locked.

Once approval has been given by the EEM/DM, the EEC will notify the DoR Communications Unit to request a change to the Queensland Government (QG) website stating that the Corella Dam is closed due to flooding.

The site may be closed for extended periods following an event due to flood waters on the access road. The road may also be closed by the DIO if deemed unsafe for travel.

If the overflow event reached Lean Forward activation status and the dam level has fallen to 297.6m, a dam inspection shall be conducted by the DIE, if it is safe to do so. For smaller events, an inspection by the DIO shall be completed as soon as practicable. Appendix A gives a guide for inspecting the dam for deficiencies.

When the DIE or DIO deems the dam site is safe to be open for public access, the DIE or DIO will notify the EEC. Once approval has been given from the EEM/DM the EEC is responsible for changing the QG website to state that the dam is open again.

5 If the RSAS is Not Working or Unreliable

The EEC is to notify the EEM, the LDC and the DIO to advise that the RSAS is not working and/or is unreliable.

A remote camera is installed on the crest of Corella Dam to provided DoR employees with daily imagery of areas of interest. DoR may control the camera in real time to assess the current condition of the dam. The camera will allow DoR to assess the condition of the dam during escalating emergency levels to gain additional insight and disprove false RSAS alarms. The camera also enables DoR to maintain a photo log for future reference.

If possible, the EEC is to rely on intel from the local residents such as the amount of rain that is falling/has fallen in the past 24 hours. Local residents are not to be requested to go to the dam site to obtain information on the state of the dam.

BOM also has rainfall information – see Appendix 6 of the EAP – Rainfall and Reservoir Level Information.

Cloncurry Shire Council (CSC) is unlikely to be requested to drive to inspect the dam site as the roads may be unsafe due to weather conditions.

All available intel is to be given to the EEM with recommendations on the possible courses of action.

6 References

Emergency Action Plan, Corella Dam

Appendix A (of SOP-14)

INSPECTING FOR DEFICIENCIES: SUMMARY

Inspection of Concrete and Masonry Dams

Inspecting for deficiencies - summary

TYPE OF DEFICIENCY	LOOK FOR…
SURFACE DEFECTS	Honeycomb: Voids around aggregate. Stratification: Non-uniform layers of aggregate in concrete. Form Slippage: Uneven joints and surfaces. Stains. Impact damage.
DISPACEMENT	Displacement at joints between blocks. Volume change in concrete. Closing or opening of joints. Loss of joint filler. Cracking. Debonding of lifts. Tilting, shearing, or shifting of hardware or machinery.
LEAKAGE and SEEPAGE	Significant new leakage on downstream face or in galleries. Wetness in abutment or foundation adjacent to toe. Major changes in leakage/seepage pattern or flow. Water spurting or running out of joints or cracks. Turbidity of the seepage. Blocked drains.
MAINTENANCE CONCERNS	Vegetation in joints between concrete blocks. Large accumulations of debris. Missing or deteriorated joint filler. Quality and condition of previous repairs. Adequacy of ventilation inside dam.

Inspection of Embankment Dams

Inspecting for deficiencies – summary

TYPE OF DEFICIENCY	LOOK FOR…
SEEPAGE	A water flow or sand boil on the lower portion of the downstream slope or toe area, especially at the groins. Leakage around conveyance structures such as outlet works. Wet areas or areas where the vegetation appears greener or more lush on the embankment slope or toe area. Blocked toe drains. An increase in the amount of water being released from toe drains. (Remember to take into account changes in the reservoir water level.) Turbidity or cloudiness of the seepage.
CRACKING	Desiccation Cracking: A random honeycomb pattern of cracks usually found on the crest and the downstream slope. Transverse Cracking: Cracks that are perpendicular to the length of the dam usually found on the crest. Longitudinal Cracking: Cracks that are parallel to the length of the dam. Longitudinal cracks may be associated with stability problems in the slopes.
INSTABILITY	Slides on the upstream or downstream slopes. Bulging, especially at the toe of the dam.
DEPRESSIONS	Misalignment in the crest and embankment slopes found by sighting along fixed points. Sinkholes found by checking and probing each depression. Remember, sinkholes have steep, bucket like sides while minor depressions have gently sloping, bowl like sides.
MAINTENANCE CONCERNS	Inadequate Slope Protection: Check for bald areas or areas where the protection is sparse or damaged. Surface Runoff Erosion: Check for gullies or other signs of erosion. Make sure to check the low points along the upstream and downstream shoulders and groins since surface runoff can collect in these areas. Inappropriate Vegetative Growth: Check for excessive and deep rooted vegetative growth. Debris: Check for debris on and around the dam, especially near outlet works or spillway inlets. Animal Burrows: Check for damage caused by burrowing animals.

When to get further assistance

Several of the deficiencies covered above are very serious. If you observe any of the following deficiencies, you should consult with the EEM:

Sand boils or turbid seepage.

Seepage that has increased since the last inspection (taking the reservoir water level into consideration).

Cracking that extends below the reservoir water level or potential reservoir water level.

Transverse and longitudinal cracking.

Deep seated slides or bulging associated with slides.

Sinkholes or other large depressions.

Deep rooted vegetation that might need to be removed.

If you are unsure whether or not a condition poses a threat to the safety of the dam, you should discuss your findings with the EEM.

Appendix 9 – Critical Water Levels

Background

The historical maximum flood level at Corella Dam is 301.0 m AHD, 3.55 m below the crest of dam.

Estimation of Critical Water Levels

Spillway flows have been estimated using the information available in the Corella Dam Data Book. The alert level has been set at EL 299.0 m, which is 1.4 m above the main spillway level and 0.5 m below the level at which the auxiliary spillway commences to flow. As the spillway arrangement has been altered in recent years, much of the peak water level history is no longer applicable to the current dam arrangement.

Population at Risk from a Corella Dam Failure

The *Corella Park* homestead is located on the left bank of the Corella River, 37 km below Corella Dam. Adjacent to the *Corella Park* homestead there are a further four dwellings, consisting of cottages or quarters for staff.

The homestead and other dwellings commence being inundated when and if the Corella Dam embankment fails in a 1 in 100 AEP or greater flood.

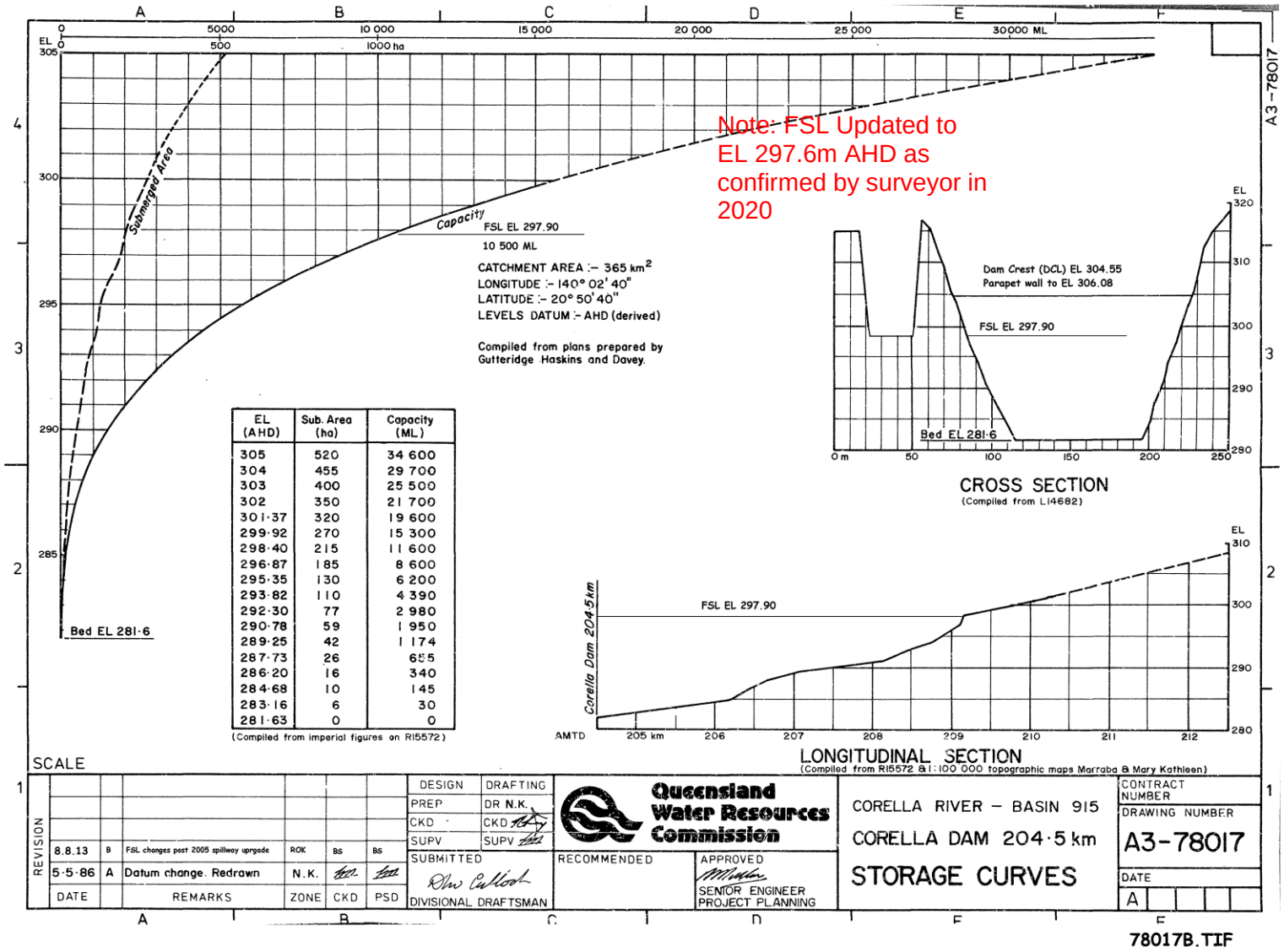
The Critical Dam Water Levels are summarised in Figure 1 – Schematic Drawing of Corella Dam.

Itinerant PAR may also exist during any dam failure scenario for the Barkly Highway Bridge and Burke Developmental Road, which may also overflow during natural flooding for a 1 in 100 AEP flood and 1 in 10,000 AEP respectively.

References

1. Guidelines for Failure Impact Assessment of Water Dams, Queensland Department of Natural Resources and Mines, November 2018
2. Report for Corella Dam Failure Impact Assessment, GHD, April 2019

Appendix 10 – Storage Capacity Curve



EL (AHD)	Sub. Area (ha)	Capacity (ML)
305	520	34 600
304	455	29 700
303	400	25 500
302	350	21 700
301·37	320	19 600
299·92	270	15 300
298·40	215	11 600
296·87	185	8 600
295·35	130	6 200
293·82	110	4 390
292·30	77	2 980
290·78	59	1 950
289·25	42	1 174
287·73	26	655
286·20	16	340
284·68	10	145
283·16	6	30
281·63	0	0

(Compiled from imperial figures on RI5572)

REVISION						
8.8.13	B	FSL changes post 2005 spillway upgrade	ROK	BS	BS
5·5·86	A	Datum change. Redrawn	N.K.		
DATE		REMARKS	ZONE	CKD	PSD

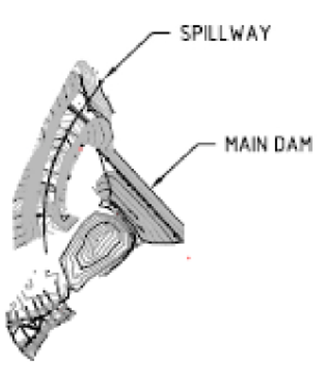
DESIGN | DRAFTING
PREP | DR N.K.
CKD | CKD
SUPV | SUPV
SUBMITTED
DIVISIONAL DRAFTSMAN
RECOMMENDED
APPROVED
SENIOR ENGINEER PROJECT PLANNING

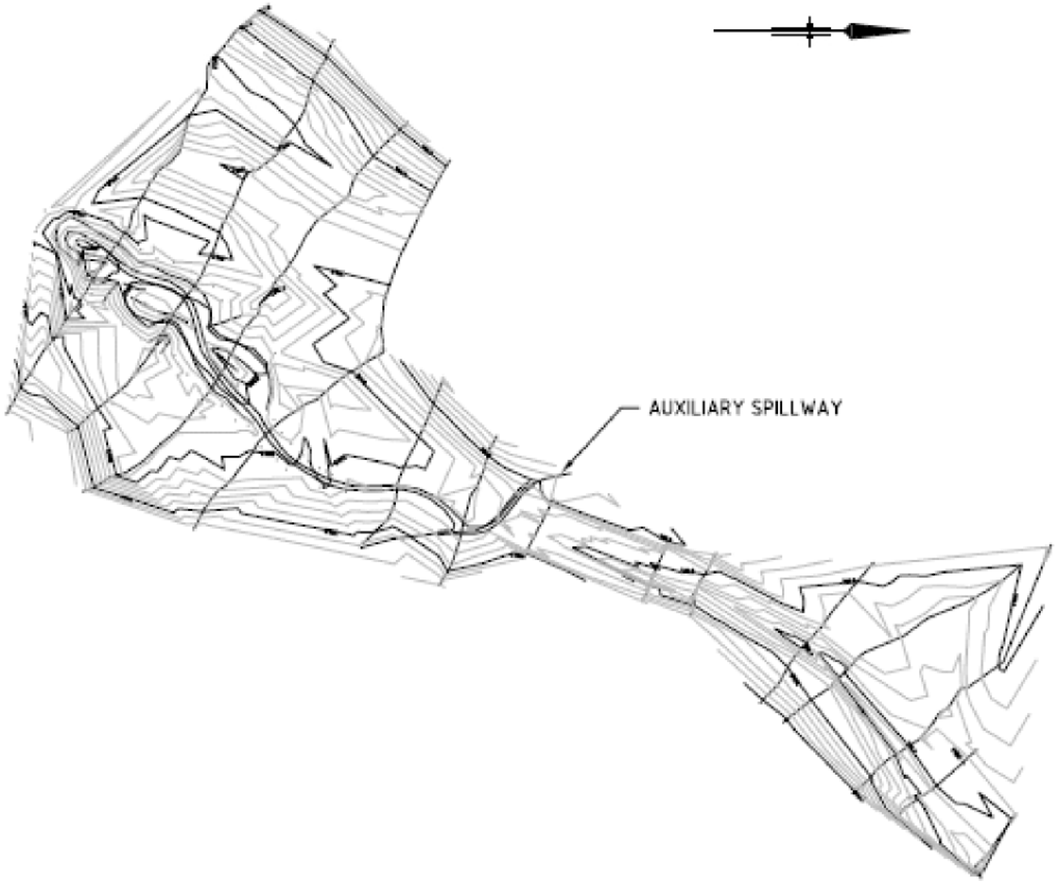
CONTRACT NUMBER
DRAWING NUMBER A3-78017
DATE A

Appendix 11 – Drawings

The following drawings show the

- Corella Dam embankment
- The primary spillway adjacent to the embankment, and
- The auxiliary spillway, which exits the reservoir 800 m north of the embankment.





0 50 100 150 200 250m

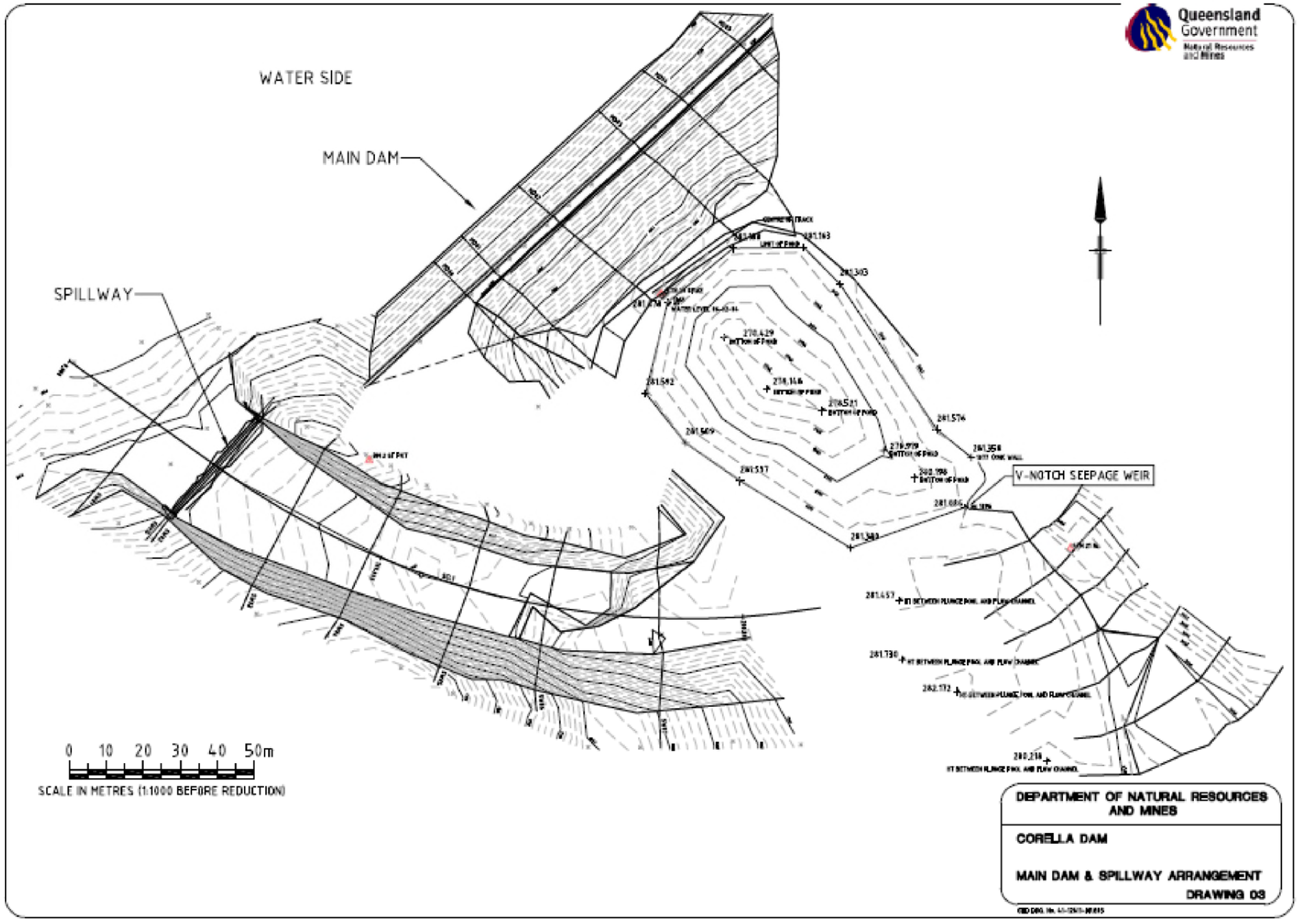
SCALE IN METRES (1:5000 BEFORE REDUCTION)

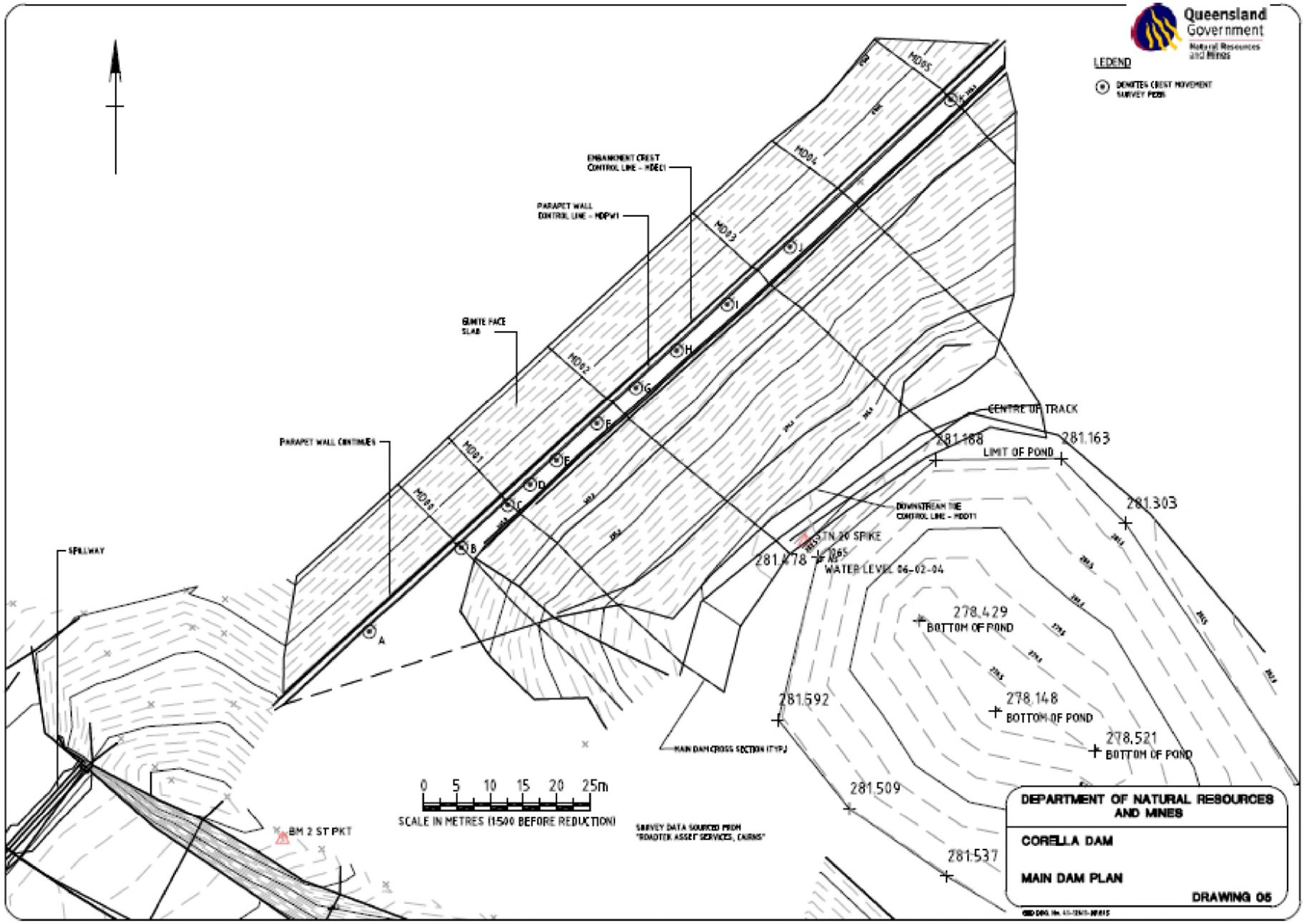
DEPARTMENT OF NATURAL RESOURCES AND MINES

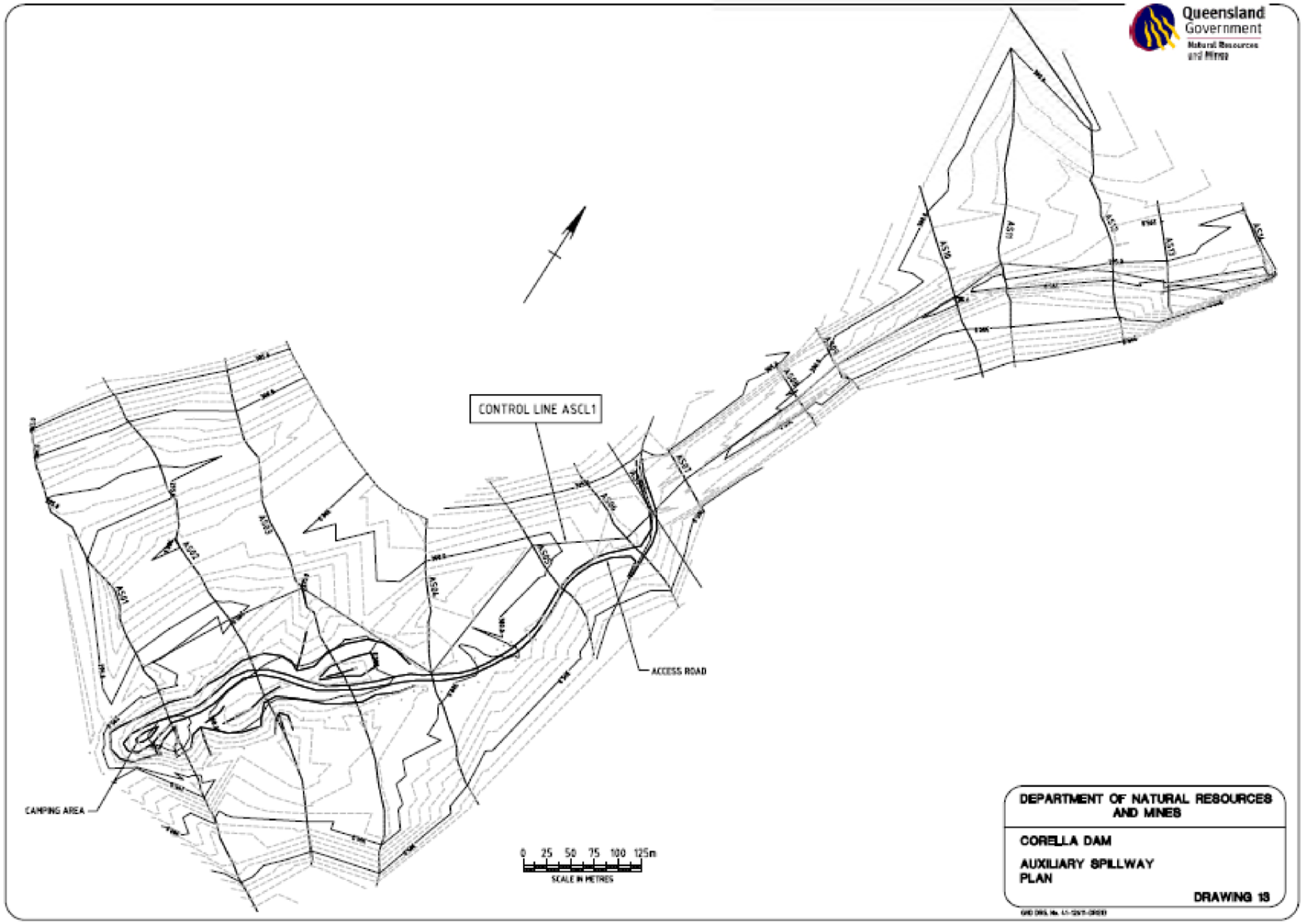
CORELLA DAM

SITE PLAN

DRAWING 02


WATER SIDE
MAIN DAM
SPILLWAY
V-NOTCH SEEPAGE WEIR
0 10 20 30 40 50m
SCALE IN METRES (1:1000 BEFORE REDUCTION)
DEPARTMENT OF NATURAL RESOURCES AND MINES
CORELLA DAM
MAIN DAM & SPILLWAY ARRANGEMENT
DRAWING 03


Queensland Government
LEGEND
EMBANKMENT CREST CONTROL LINE - MDEC1
PARAPET WALL CONTROL LINE - MDPW1
GUNITE FACE SLAB
PARAPET WALL CONTINUES
SPILLWAY
CENTRE OF TRACK
281.188
281.163
LIMIT OF POND
281.303
DOWNSTREAM TOE CONTROL LINE - MDDT1
STN 20 SPIKE
281.478
WATER LEVEL 06-02-04
278.429
BOTTOM OF POND
281.592
278.148
BOTTOM OF POND
278.521
BOTTOM OF POND
281.509
281.537
MAIN DAM CROSS SECTION (TYP.)
0 5 10 15 20 25m
SCALE IN METRES (1:500 BEFORE REDUCTION)
SURVEY DATA SOURCED FROM "ROADTEK ASSET SERVICES, CAIRNS"
BM 2 ST PKT
DEPARTMENT OF NATURAL RESOURCES AND MINES
CORELLA DAM
MAIN DAM PLAN
DRAWING 05


Queensland Government
Natural Resources and Mines
CONTROL LINE ASCL1
ACCESS ROAD
CAMPING AREA
0 25 50 75 100 125m
SCALE IN METRES
DEPARTMENT OF NATURAL RESOURCES AND MINES
CORELLA DAM
AUXILIARY SPILLWAY PLAN
DRAWING 18

Appendix 12 – Training

Training and mock exercises shall be organised by the EEM annually to include TS Officers, however may be extended to DIOs, Regional Disaster Management Group personnel and others as appropriate.

An Attendance Record is to be maintained for each training event.

Officer	EAP Role	Dam Safety Training	EAP Scenario Training
[redacted]	DIO	September 2022	October 2015 (Crooks Dam)
[redacted]	DIO Backup 1		
[redacted]	DIO Backup 2	September 2022	
[redacted]	DIO Backup 3	September 2022	
[redacted]	EEC	September 2023	
[redacted]	EEM	September 2023	November 2022
[redacted]	EEM	September 2023	November 2022
[redacted]	DM	September 2023	
[redacted]	EEC Backup	September 2023	November 2022
[redacted]	EEC Backup	September 2023	November 2022

Appendix 13 – Queensland Government Website Procedure

The Queensland Government website (qld.gov.au) provides information to the public about each referable dam. This includes facilities available at each dam, the status of each dam, and if there are road and/or dam closures.

The link to this page on the website is:
https://www.qld.gov.au/environment/water/catchments/state-owned-dams

It may be necessary during an event to update the website for a dam/s; for instance, if public access to the dam has been closed due to flooding.

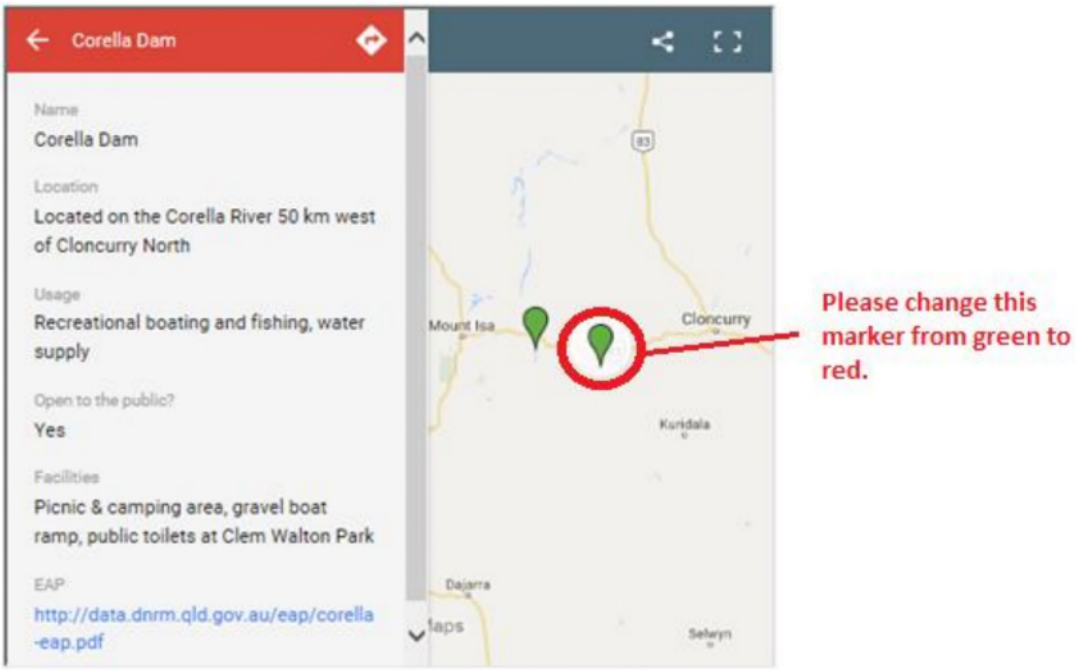
The procedure for changing the information on the website is as follows:-

Seek approval from the EEM/DM to change the website to state the dam is closed. Once approval has been given, provide to Communications the changes that are required. Below is an example of the changes requested to be made to the website. Make a copy of the website as it is currently, e.g. by using the Snipping Tool to capture the map and details, then make the required changes in Paint.

Communications prefer a photograph/s of the dam in flooding.

Ring/email Communications and provide information on what is to be changed on the website and state the required timeframe (usually a turnaround of one day). It is important that the website is changed as soon as the dam has been closed so the public do not travel to the dam and find it closed.

Save communications here:



Recreational dams and weirs open to the public

Information regarding the dam closure can also be shared on Twitter and other relevant social media. Suggested wording is:

> *Due to heavy rainfall in northern Queensland, Corella Dam (near Cloncurry) is currently discharging over the spillway and the dam is temporarily closed. This closure includes all public access, camping and day visits to the dam. The department is monitoring the situation and has notified the relevant parties.*

If Corella Dam is to be closed for an extended period and/or over a public holiday, a media release may be considered and approval must be sought from the EEM/DM. Suggested wording for a media release is:

> *The Department of Resources advise that Corella Dam, located east of Mount Isa in the Cloncurry Shire is temporarily closed. This is due to flood damage to the roads leading to the dam, continual spilling of the dam, and the likelihood of further rainfall. This closure includes all public access, camping and day visits to the dam. The road to the dam is currently locked and will remain locked over the Easter holiday period. The department will advise when public access to the dam re-opens.*
>
> *For updates, refer to the QG website www.qld.gov.au.*

Cloncurry Shire Council has a website and a Facebook page and can be requested to include information on dam closures. The above wording can be provided to them.

NOTE: It is important that once the DIO/DIE has deemed the dam site is safe for public access, approval is sought from the EEM/DM and the website is updated.

Communications Contacts:

Primary Contact:

Principal Communications Officer
Department of Resources

Secondary Contact:

Communication Officer
Department of Resources