



Central Queensland Coal Project
Appendix 5e – Preliminary Dams
Consequence Category Assessment

Central Queensland Coal

CQC SEIS, Version 3

October 2020

MEMORANDUM

Project:	M7264_002 CQC	Date:	31 August 2020
To:	Central Queensland Coal	From:	Andrew Vitale (RPEQ No. 9341)
ATT:	Natasha McIntosh	CC:	Marc Walker
Subject:	Preliminary Dams Consequence Category Assessment		

INTRODUCTION

This Memorandum details the outcomes of a preliminary assessment of the consequence categories of the proposed water storage and flood protection structures associated with the proposed Central Queensland Coal (CQC) Project. The preliminary consequence category assessment was undertaken in accordance with the latest version (Version 5.01) of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures ESR/2016/1933 (DES, 2016).

BACKGROUND

The CQC Project is a proposed open cut coal mine currently progressing through the Environmental Impact Statement (EIS) approvals process. The Project is located along the Bruce Highway, 130 km northwest of Rockhampton in the Styx River Basin in Central Queensland. It is situated within the Livingstone Shire Council Local Government Area and the majority of the Project is located within the "Mamelon" property, described as real property Lot 11 on MC23, Lot 10 on MC493 and Lot 9 on MC496 (refer to Figure 1).

The Project will involve open cut coal mining and will be located within Mining Lease (ML) 80187 and ML 700022. Development and initial early construction work of the Project are proposed to commence upon receipt of environmental approvals and extend operationally for approximately 24 years until mining and rehabilitation activities are successfully completed.

The operational phase of the Project will consist of two open cut operations that will be mined using a truck and shovel methodology and processed in two Coal Handling and Preparation Plants (CHPP). At maximum production, the mine will produce 10 Mtpa of Run of Mine (ROM) coal. Rehabilitation works will occur progressively through the mine operational phase.

A new Train Loadout Facility will be developed within ML 700022 to connect into the existing Queensland Rail North Coast Rail Line. This connection will allow the product coal to be transported to the established coal loading infrastructure at the Dalrymple Bay Coal Terminal (DBCT).

The proposed water management system for the CQC Project has been developed during the technical studies for the Environmental Impact Statement (EIS) and is described in the Flood Study and Site Water Balance Technical Report (WRM, 2020). The proposed mine water management system includes a number of dams for containment of stormwater runoff from disturbed areas within the mine and a levee to provide flood protection to the northern parts of the mine (north of the Bruce Highway).

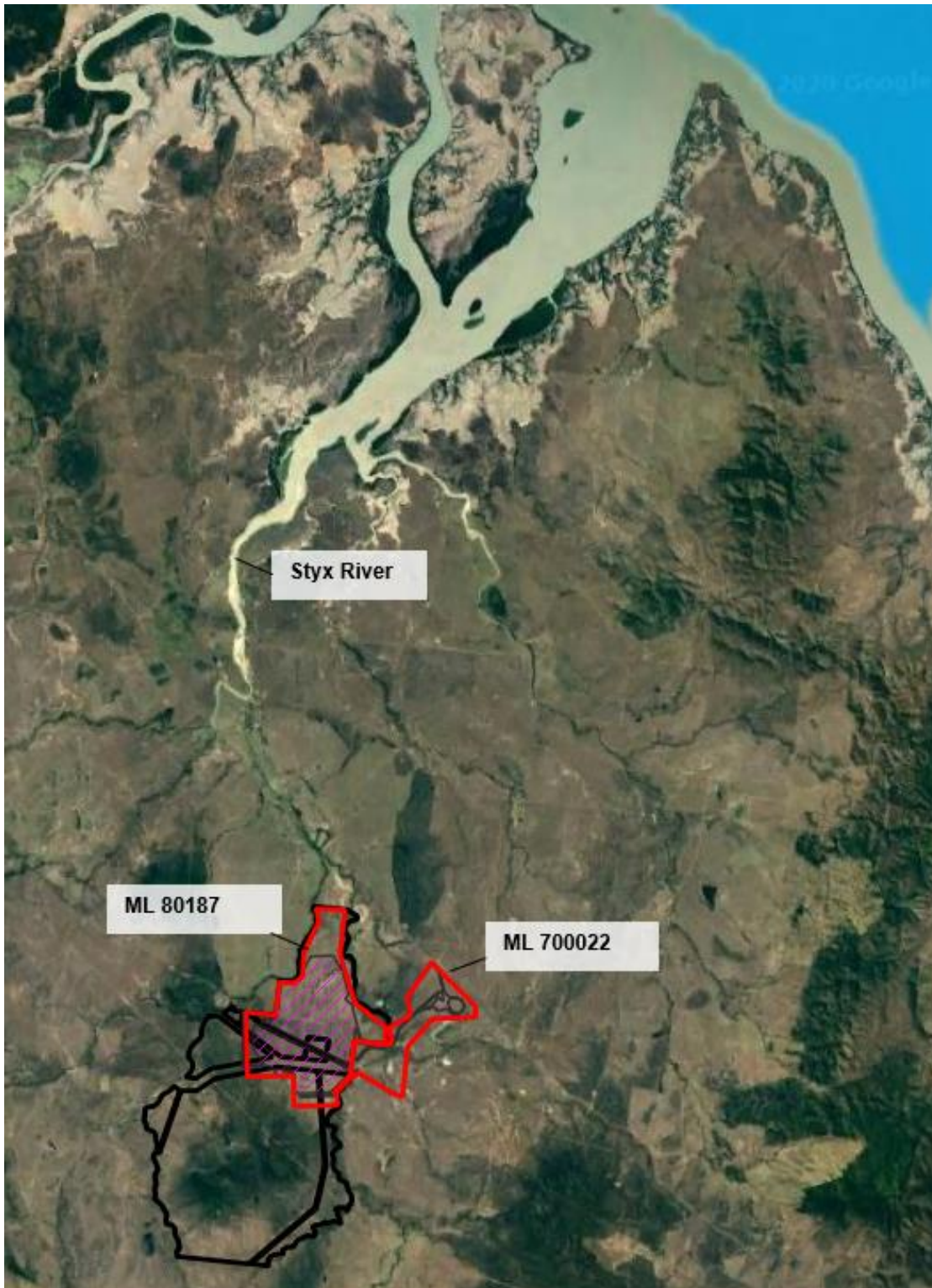


Figure 1 Overview of Mamelon Property Location (Black), Project Mining Leases (Red) and Proposed Mining Disturbance Area Footprint (Shaded)

STRUCTURE DETAILS

Concept level details of the proposed water storage and flood protection structures are provided in Table 1. The locations and configurations of the proposed water storage and flood protection structures are shown in the Mine Layout Plan included in Appendix A.

Table 1 Details of Proposed Water Storage and Flood Protection Structures (WRM, 2020)

Structure	Storage Capacity (ML)	Purpose of Structure	Overflow Destination ¹	Dam Break Destination ¹
Dam 1	2,783	Bulk water storage and release dam	Tooloombah Creek Styx River	Tooloombah Creek or Deep Creek, Styx River
Env. Dam 1B	23.7	Sediment dam for waste rock stockpile	Tributary of Tooloombah Creek, Tooloombah Creek, Styx River	Tributary of Tooloombah Creek, Tooloombah Creek, Styx River
Env. Dam 1C ²	44.1	Mine affected water containment dam for southern CHPP and Mine Industrial Area	Tributary of Deep Creek, Northern Diversion Drain, Deep Creek, Styx River	Tributary of Deep Creek, Northern Diversion Drain, Deep Creek, Styx River
Env. Dam 2D1&2	26.9	Sediment dam for haul road to Rail Loadout	Deep Creek, Styx River	Deep Creek, Styx River
Dam 4	95.8	Sediment dam for haul road and Rail Loadout	Tributary of Deep Creek, Deep Creek, Styx River	Tributary of Deep Creek, Deep Creek, Styx River
Flood Protection Levee	N/A	Flood protection to northern mining areas	Dam 1 and Open Cut 2	Dam 1 and Open Cut 2

¹ Overflow and dam break destinations are listed in successive order according to the drainage network downstream of the structures.

² Env. Dam 1C will overflow to Dam 1, and so no actual operational discharges are anticipated. For the purposes of this report, however, an overflow direct to receiving waters has been assumed.

The water quality within the water containment dams was predicted as part of the water balance modelling for the mine water management system (WRM, 2020). The following contaminants were modelled:

- Electrical conductivity (EC);
- Arsenic (As);
- Molybdenum (Mo);
- Selenium (Se);
- Sulphate (SO₄); and
- Vanadium (V).

The water quality modelling results indicate that only Dam 1 will have significantly elevated water salinity (median EC values in range 5,000 to 10,000 µS/cm and maximum EC of approximately 20,000 µS/cm) as a result of evapo-concentration effects. The other dams are intended to be operated at very low water levels via pumping to Dam 1 and accordingly these dams will be of relatively low salinity (EC less than 1,000 µS/cm) since water will not be stored in these dams for extended periods.

All dams with the exception of Environmental Dam 1B may also contain other contaminants (e.g. hydrocarbons, coal fines, etc.) since they will contain runoff from the CHPPs, Mine Industrial Areas, Rail Load-Out or haul roads. Environmental Dam 1B will only contain runoff from waste rock stockpile areas.

RECEIVING ENVIRONMENT

Receiving Waterways

The mining lease area is located between two major tributaries of the Styx River; Tooloombah Creek to the west and Deep Creek to the east, as shown in Figure 2. The confluence of these creeks, which forms the Styx River, is located 2.3 kilometres downstream of the northern extent of the mining lease area. The total catchment area of the Styx River to Ogmoo Bridge is 717 km². The catchment is rural with minimal development and unregulated streams. It is traversed by the Bruce Highway, which runs through the middle of the mining lease area, and the North Coast railway line to the north-east of the mining lease area.

The upper reaches of Tooloombah and Deep creeks extend west to the Broadsound Range which is characterised by steep topography with grades of approximately 10%. The majority of the lower reaches of the catchment where the Project is located are characterised by generally flat terrain with slopes less than 0.5%. The main watercourses are deeply incised. [WRM, 2020]

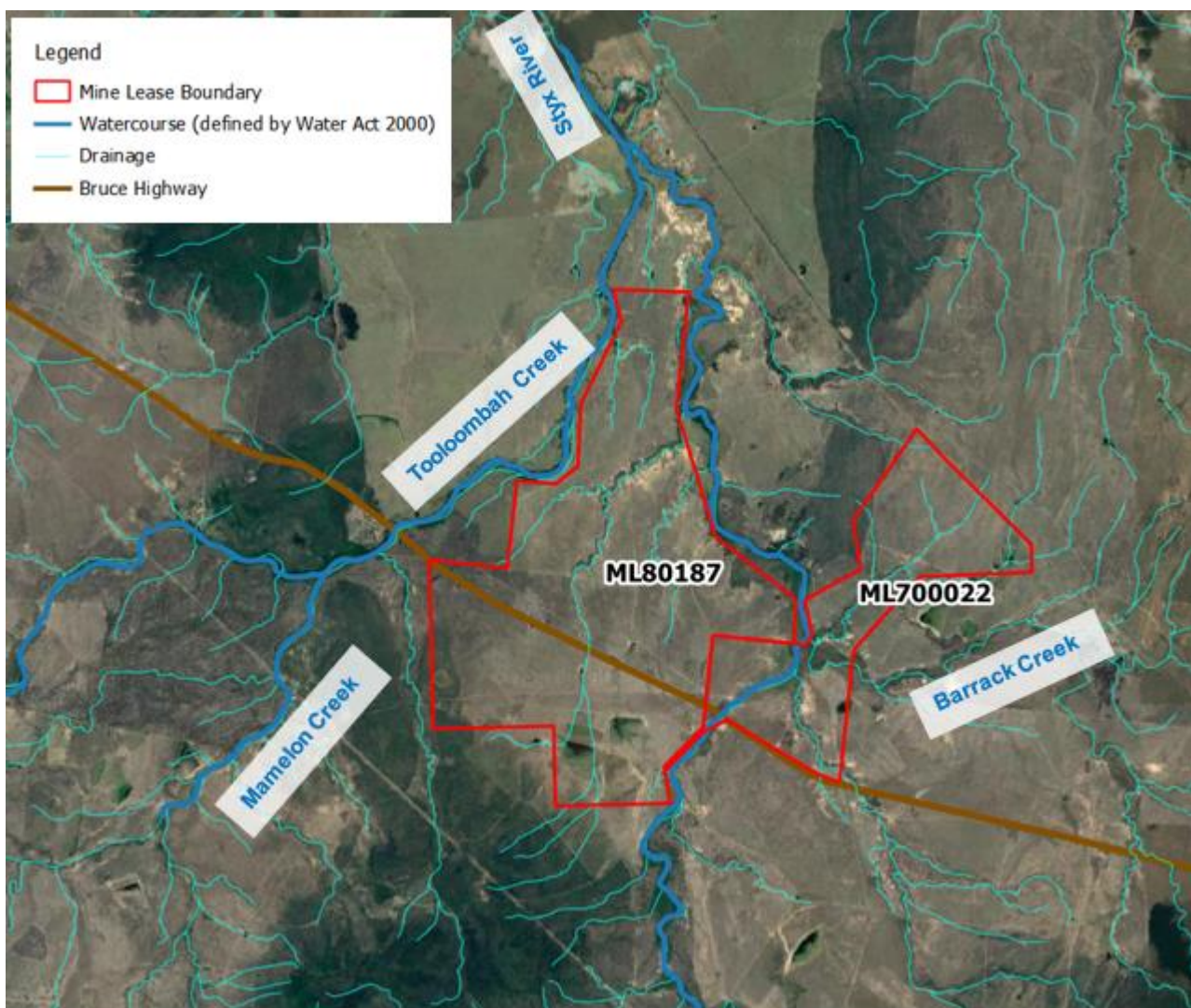


Figure 2 Adjacent Waterways

Groundwater

The Queensland Groundwater Database contains records for 69 registered groundwater bores within the portion of Styx River Basin where the Project is located (refer to Figure 3). Of these, 15 bores are identified as State Government owned bores and the remaining 54 bores have unspecified ownership but are likely to be privately owned (Central Queensland Coal, 2017a). Groundwater bores are used by some landholders in the region to supply water to dams and/or storage tanks for the purposes of stock and domestic water supply (HydroAlgorithmics, 2020).

Land Use

The land within and surrounding the CQC Project area is predominately used for cattle grazing and some dryland cropping.

Matters of State Environmental Significance (MSES)

Matters of State Environmental Significance (MSES) are located along the receiving waterways downstream of the Project (refer to Figure 4) and are mainly associated with regional ecosystems classified as 'endangered' or 'of concern' and 'essential habitat' under the *Vegetation Management Act 1999*. The nearest wetland of 'high ecological significance' is located within the mine lease boundary, south of the Bruce Highway, however is in a location that will not receive inflows from a failure of any of the mine water management structures. The Broad Sound and Great Barrier Reef Marine Park are also identified MSES at the mouth of the Styx River.

Matters of National Environmental Significance (MNES)

The Australian Government Department of Agriculture, Water and the Environment Protected Matters Search Tool (<http://www.environment.gov.au/webgis-framework/apps/pmst/>) indicates that Matters of National Environmental Significance (MNES) are located downstream of the Project (refer to Figure 5). The project lies approximately 10 km from the boundary of the Great Barrier Reef World Heritage Area (GBRWHA) (Central Queensland Coal, 2017b).

The Styx River discharges into the Broad Sound (refer to Figure 5) which is listed in the Directory of Important Wetlands in Australia (DIWA), comprising an area of 211,765 ha. As a conservation measure, parts of the Broad Sound and adjoining estuarine systems were gazetted as a Declared Fish Habitat Area (FHA-047) by the Qld Government Department of Primary Industries and Fisheries on 28 March 2008. [HydroAlgorithmics, 2020]

The Tooloombah Creek Conservation Park is located 1 km west of the western mine lease boundary (south of the Bruce Highway), however is in a location that will not receive inflows from a failure of any of the mine water management structures.

Habitable Dwellings

Figure 6 shows the location of habitable dwellings near the Project Area. The township of Ogmore is located to the east of the Styx River approximately 5 km downstream of the CQC Project (Central Queensland Coal, 2017c). Topographic data indicates that the township of Ogmore is unlikely to be at risk of inundation from the failure of any of the proposed water containment dams, however a dam break study would be required to confirm this.

Surface Water Users

Reported surface water entitlements (HydroAlgorithmics, 2020) to support agricultural activities along Deep Creek and Tooloombah Creek for irrigation, stock and domestic water supply are as follows (refer Figure 7):

- ID3: 20 ha authorised for irrigation (Property 119/CP900367) sourced from Deep Creek (approximately 3 km downstream of the CQC Project);
- ID1: 8 ha authorised for irrigation (Property 45/MPH26062) sourced at an existing extraction point to supply a small off-stream storage on the western overbank of Tooloombah Creek (neighbouring property north-west of the CQC Project); and
- ID2: 18 ML per annum for stock and domestic supply (Properties 1/RP616700 and 19/MC495) sourced from Tooloombah Creek (neighbouring property north of the CQC Project).

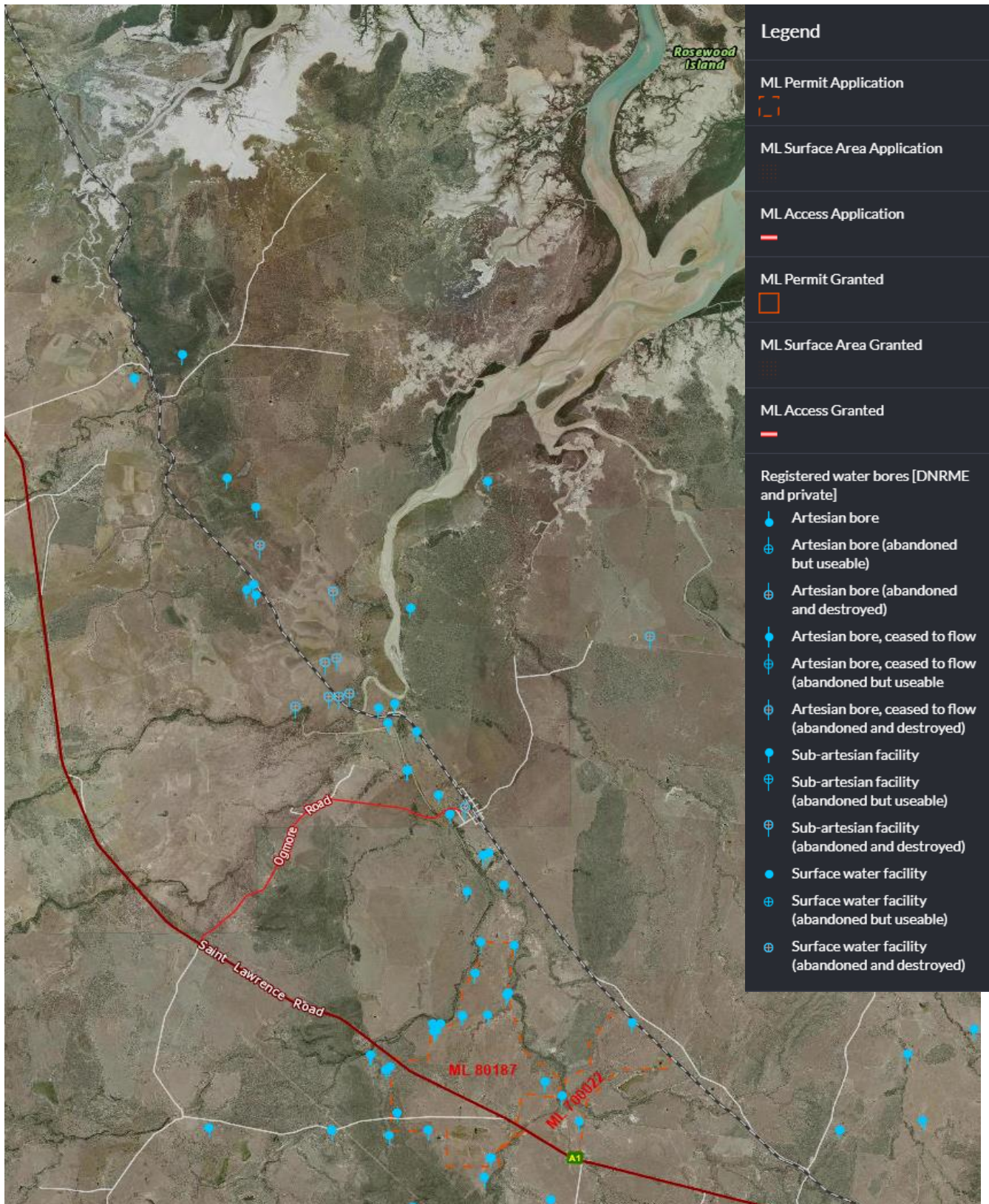


Figure 3 Location of Registered Groundwater Bores (Source: Queensland Globe)

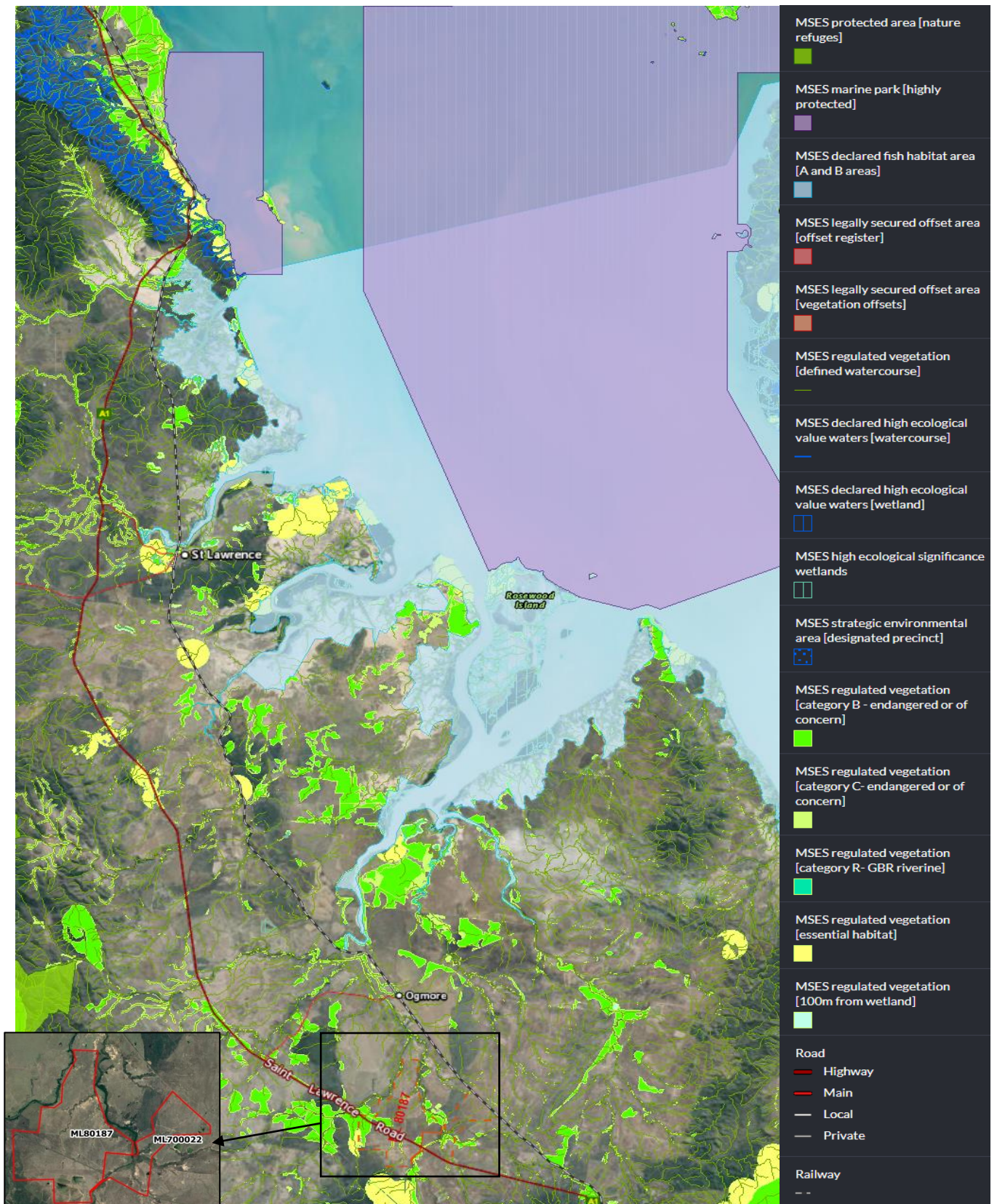


Figure 4 Matters of State Environmental Significance (MSES) (Source: Queensland Globe)

Brisbane Office
P: 07 3221 7174
E: admin@engeny.com.au

Melbourne Office
P: 03 9888 6978
E: melb@engeny.com.au

Newcastle Office
P: 02 4926 1225
E: newcastle@engeny.com.au

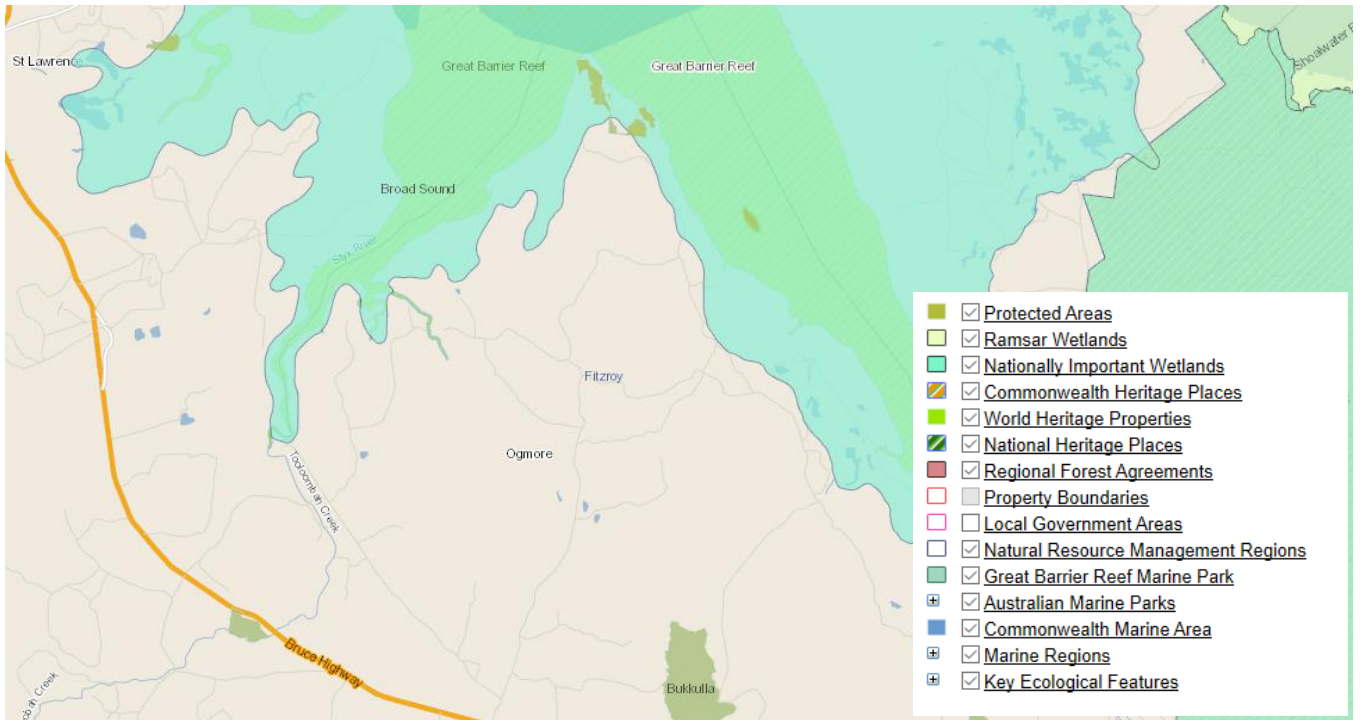


Figure 5 Matters of National Environmental Significance (MNES) (Source: Protected Matters Search Tool)

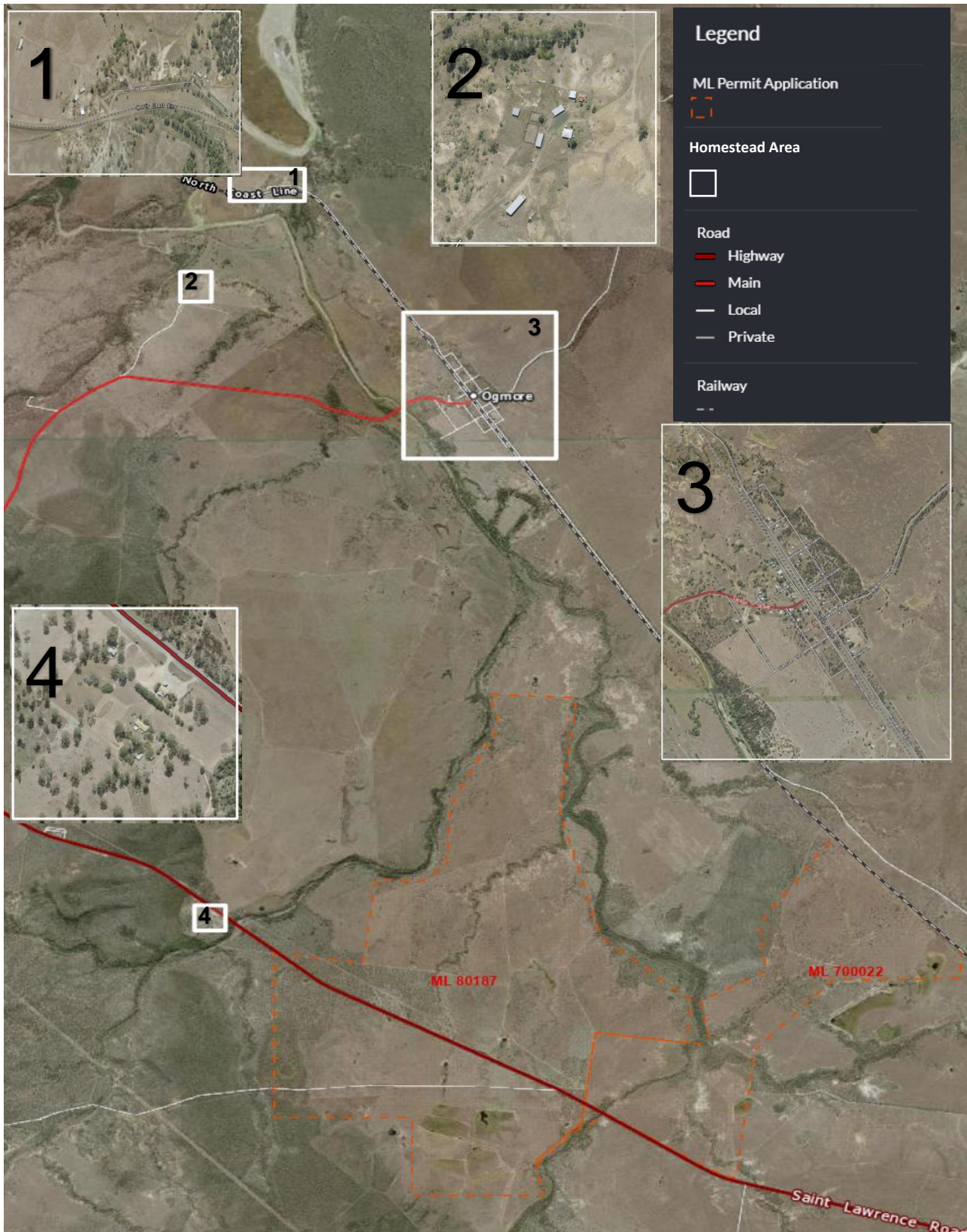


Figure 6 Habitable Dwellings in the Vicinity of the Project Area (Source: Queensland Globe)

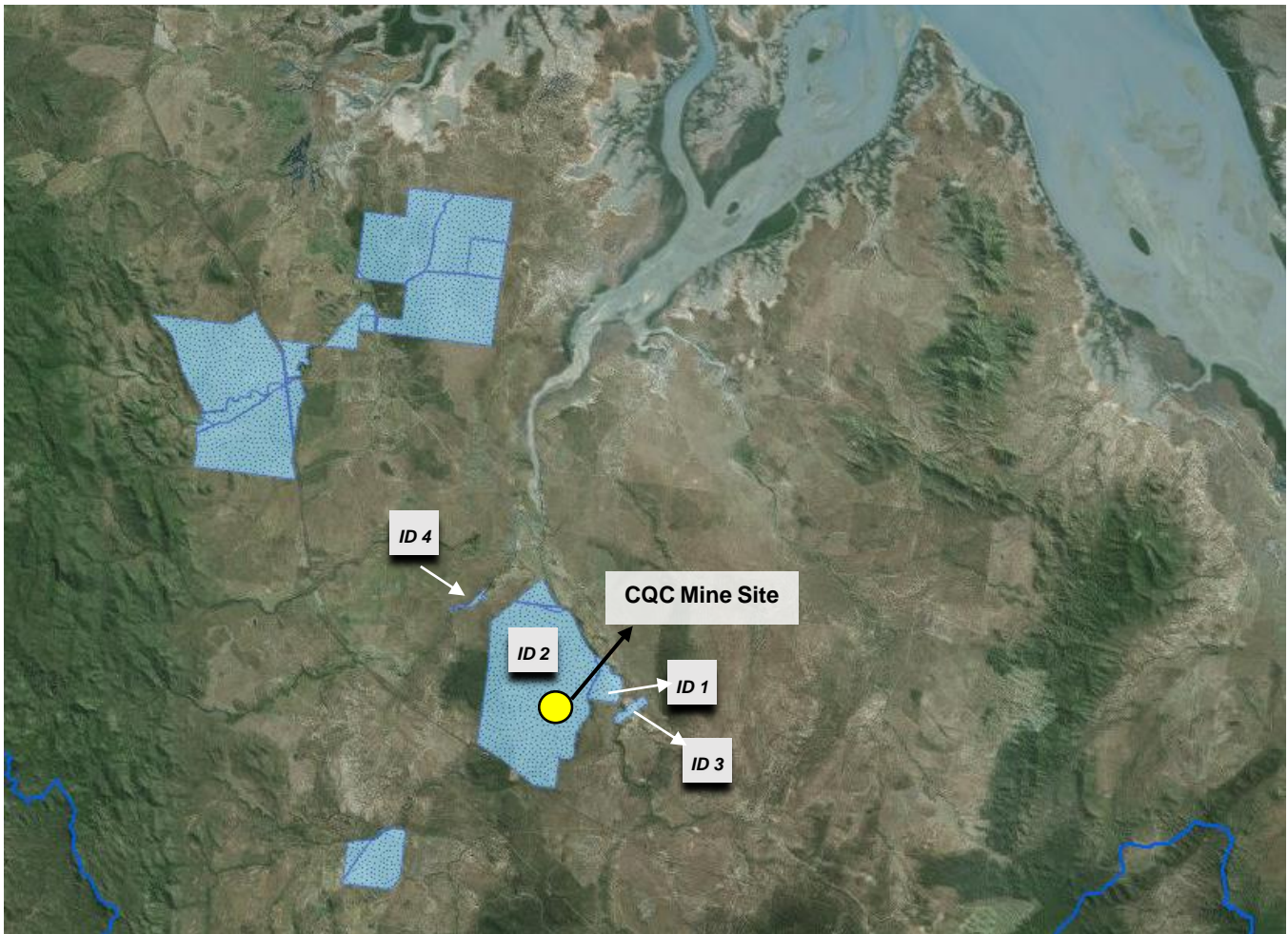


Figure 7 Existing Surface Water Licences in the Vicinity of the Project Area (Source: Queensland Water Entitlement Viewer)

A surface water extraction point exists on Montrose Creek approximately 5 km west of Ogmore (refer ID4 on Figure 7). The Montrose Creek Intake is part of the Ogmore Water Supply System which is managed by the Livingstone Shire Council. Non-potable water is pumped directly from the Montrose Creek Weir (a small, 0.5 m high concrete weir, with a storage capacity of approximately 12 megalitres) to four small ground level storage tanks in the Ogmore township and is distributed periodically to residents (HydroAlgorithmics, 2020).

PRELIMINARY CONSEQUENCE CATEGORY ASSESSMENT

A consequence category assessment was undertaken for the proposed water storage and flood protection structures. The consequence category assessment was undertaken in accordance with the latest version (Version 5.01) of the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures ESR/2016/1933 (DES, 2016). The Manual sets out requirements for consequence category assessment and certification of the design of regulated structures, constructed as part of environmentally relevant activities (ERAs) under the *Environmental Protection Act 1994*.

The term 'regulated structures' includes land-based containment structures, levees, bunds, and voids, but not a tank or container designed and constructed to an Australian Standard that deals with strength and structural integrity. Structures may be assessed using this Manual as being in one of three consequence categories: Low, Significant, or High. Where categorised as Significant or High consequence, the structure is referred to as a regulated structure.

The Manual for Assessing Consequence Categories and Hydraulic Performance of Structures requires the assessment of the consequences of the following failure event scenarios:

- 'Failure to contain – seepage' – spills or releases to ground and/or groundwater via seepage from the floor and/or sides of the structure.
- 'Failure to contain – overtopping' – spills or releases from the structure that result from loss of containment due to overtopping of the structure.
- 'Dam break' – collapse of the structure due to any possible cause.

For each failure event scenario, the consequences need to be assessed for the following categories of harm:

- Harm to humans.
- General environmental harm.
- General economic loss or property damage.

The consequence category for each type of harm is assigned based on the severity of harm as defined in Table 2 (Table 1 of Manual).

Table 2 Consequence Category Assessment Criteria (Table 1 of Manual)

Category of Harm	Consequence Category		
	High	Significant	Low
Harm to Humans	<p>Location such that people are routinely present in the failure path and if present loss of life to greater than 10 people is expected¹.</p> <p>Note: The requirement to consider the location of people in the failure path is only relevant to the 'dam break' scenario.</p>	<p>Location such that people are routinely present in the failure path and if present loss of life to 1 person or greater but less than 10 people is expected¹.</p> <p>Note: The requirement to consider the location of people in the failure path is only relevant to the 'dam break' scenario.</p>	<p>Location such that people are not routinely present in the failure path and loss of life is not expected¹.</p> <p>Note: The requirement to consider the location of people in the failure path is only relevant to the 'dam break' scenario.</p>
	<p>Location such that contamination of waters (surface and/or groundwater²) used for human consumption could result in the health of 20 or more people being affected³.</p>	<p>Location such that contamination of waters (surface and/or groundwater²) used for human consumption could result in the health of 10 or more people but less than 20 people being affected.</p>	<p>Location such that contamination of waters (surface and/or groundwater²) used for human consumption could result in the health of less than 10 people being affected.</p>
General Environmental Harm	<p>Location such that:</p> <p>a) Contaminants may be released to areas of MNES, MSES or HEV waters that are not already authorised to be disturbed to at least the same extent under other conditions of this authority subject to any applicable offset commitment (Significant Values); and</p> <p>b) Adverse effects⁴ on Significant Values are likely; and</p> <p>c) The adverse effects are likely to cause at least one of the following:</p> <p>i) Loss or damage or remedial costs greater than \$50,000,000; or</p> <p>ii) Remediation of damage is likely to take 3 years or more; or</p>	<p>Location such that contaminants may be released so that adverse effects (that are not already authorised to be disturbed to at least the same extent under other conditions of this authority subject to any applicable offset commitment) either:</p> <p>a) Would be likely to be caused to Significant Values but those adverse effects would not be likely to meet the thresholds for the High consequence category and instead would be likely to cause at least one of the following:</p> <p>i) Loss or damage or remedial costs greater than \$10,000,000 but less than \$50,000,000; or</p> <p>ii) Remediation of damage is likely to take more than 6 months but less than 3 years; or</p>	<p>Location such that either:</p> <p>a) Contaminants are unlikely to be released to areas of Significant Values or Moderate Values; or</p> <p>b) Contaminants are likely to be released to those areas, but would be unlikely to meet any of the minimum thresholds specified for the Significant Consequence Category for adverse effects.</p>

Category of Harm

Consequence Category

	High	Significant	Low
	<p>iii) permanent alteration to existing ecosystems; or</p> <p>iv) The area of damage (including downstream effects) is likely to be at least 5 km².</p>	<p>iii) Significant alteration to existing ecosystems; or</p> <p>iv) The area of damage (including downstream effects) is likely to be at least 1 km² but less than 5 km².</p> <p>or</p> <p>b) Would be likely to be caused to environmental values classed as slightly or moderately disturbed waters⁵, wetland of general ecological significance⁶, riverine areas, springs or lakes and associated flora and fauna (Moderate Values), and the adverse effects are likely to cause at least one of the following:</p> <p>i) Loss or damage or remedial costs greater than \$20,000,000; or</p> <p>ii) Remediation of damage is likely to take more than 1 year; or</p> <p>iii) Significant alteration to existing ecosystems; or</p> <p>iv) The area of damage (including downstream effects) is likely to be at least 2 km².</p>	
General Economic Loss or Property Damage	Location such that harm (other than a different category of harm as specified above) to third party assets in the failure path would be expected to require \$10 million or greater in rehabilitation, compensation, repair or rectification costs ⁷ .	Location such that harm (other than a different category of harm as specified above) to third party assets in the failure path would be expected to require \$1 million and greater but less than \$10 million in rehabilitation, compensation, repair or rectification costs ⁷ .	Location such that harm (other than a different category of harm as specified above) to third party assets in the failure path would be expected to require less than \$1 million in rehabilitation, compensation, repair or rectification costs ⁷ .

¹ 'People routinely present in the failure path' could be considered to be people who occupy buildings or other places of occupation that lie within the failure impact zone. For the purposes of this Manual, this should refer to people other than site personnel engaged by the resource operation and located on the tenements and tenure associated with the resource operation; for other ERAs, it would be the 'premises referred to in the authority'. It should be noted that while this is appropriate for the assessment of consequence categories in accordance with this Manual, adherence to the requirements of this Manual does not limit, amend or change in any way, any other requirements to be complied with under relevant health and safety acts or legislation that requires the safety of site personnel to be considered.

² When considering potential impacts on groundwater, it is not envisaged that a full hydrogeological assessment will be required in all cases. Any consideration of potential impacts on groundwater systems should consider the water quality of the potential receiving aquifer as well as the quality of fluid stored in the regulated dam. Existing groundwater drawdown in areas surrounding resource operations (e.g. drawdown as a result of mine pit or underground mine dewatering) can also be considered when assessing the consequence of dam seepage on groundwater systems.

³ 'An adverse effect on human health means a physiological effect on human health and does not include an impact on the quality of downstream water that merely negatively affects taste and which is unlikely to cause persons to become physically ill.

⁴ Adverse effects includes chronic and acute effects where an acute effect is on living organism/s which results in severe symptoms that develop rapidly, and a chronic effect is an adverse effect on a living organism/s which develops slowly. In some instances, it may be necessary to carry out or reference existing ecological/toxicological studies to assess the impacts of contaminants on living organisms.

⁵ See Water EPP for definitions.

⁶ 'Wetland of general ecological significance' means a wetland shown on a map of referable wetland as a 'general ecologically significant wetland' or 'wetland of other environmental value'.

⁷ This does not include the holder's own mine or gas production, on-site industrial or commercial assets, the holder's workers' accommodation, agricultural facilities on the holder's land such as a farm shed or farm dam or infrastructure solely for servicing the holder.

The consequence category will determine whether the structure is a regulated structure. A structure is only a regulated structure where the consequence category for the structure is 'significant' or 'high'. The overall consequence category of a structure is the highest consequence category determined for any of the categories of harm and failure event scenarios.

Table 3 outlines the preliminary Consequence Category Assessment (CCA) outcomes for the proposed CQC water storage and flood protection structures. The CCA results are based on the concept design, intended operational strategy, and expected contaminant concentrations of stored contents for each structure. Final certified consequence category assessments will need to be undertaken during the detailed design of the structures.

Table 3 Preliminary Consequence Category Assessment Outcomes and Determination

Structure	Scenario	Category of Harm	Consequence Category	Determination
Dam 1	Failure to Contain - Seepage	Harm to Humans	Low	The dam will contain a large quantity of water with elevated salinity that could result in material environmental harm to the highly sensitive receiving environment in the event of a seepage or overtopping failure to contain event. Dam break failure of the dam would likely result in very significant environmental harm and considerable third party property damage and economic loss. Harm to humans from a dam break failure of the dam is considered unlikely to occur but would need to be confirmed with a dam break assessment.
		General Environmental Harm	Significant	
		General Economic Loss or Property Damage	Low	
	Failure to Contain - Overtopping	Harm to Humans	Low	
		General Environmental Harm	Significant	
		General Economic Loss or Property Damage	Low	
	Dam Break	Harm to Humans	Uncertain	
		General Environmental Harm	High	
		General Economic Loss or Property Damage	Significant	
Env. Dam 1B	Failure to Contain - Seepage	Harm to Humans	Low	Overtopping or dam break failure of the dam may result in material environmental harm to the receiving environment. Seepage impacts are expected to be relatively minor as a result of the small footprint and low height of the dam and the dilution capacity of the receiving groundwater system.
		General Environmental Harm	Low	
		General Economic Loss or Property Damage	Low	
	Failure to Contain - Overtopping	Harm to Humans	Low	
		General Environmental Harm	Significant	
		General Economic Loss or Property Damage	Low	

Structure	Scenario	Category of Harm	Consequence Category	Determination		
	Dam Break	Harm to Humans	Low			
		General Environmental Harm	Significant			
		General Economic Loss or Property Damage	Low			
Env. Dam 1C	Failure to Contain - Seepage	Harm to Humans	Low	<p>Env. Dam 1C will receive runoff from the CHPP and MIA area which is likely to have elevated concentration of coal fines, hydrocarbons and metals.</p> <p>Overtopping or dam break failure of the dam may result in material environmental harm to the receiving environment.</p> <p>Seepage impacts are expected to be relatively minor as a result of the small footprint and low height of the dam and the dilution capacity of the receiving groundwater system.</p>		
		General Environmental Harm	Low			
		General Economic Loss or Property Damage	Low			
	Failure to Contain - Overtopping	Harm to Humans	Low			
		General Environmental Harm	Significant			
		General Economic Loss or Property Damage	Low			
	Dam Break	Harm to Humans	Low			
		General Environmental Harm	Significant			
		General Economic Loss or Property Damage	Low			
	Env. Dam 2D1	Failure to Contain - Seepage	Harm to Humans		Low	<p>The dam will have a small storage capacity and is not expected to contain water of high toxicity (haul road runoff). The consequences of seepage, overtopping or dam break failures are considered likely to be relatively minor.</p>
			General Environmental Harm		Low	
			General Economic Loss or Property Damage		Low	
Failure to Contain - Overtopping		Harm to Humans	Low			
		General Environmental Harm	Low			
		General Economic Loss or Property Damage	Low			
Dam Break		Harm to Humans	Low			
		General Environmental Harm	Low			

Structure	Scenario	Category of Harm	Consequence Category	Determination
		General Economic Loss or Property Damage	Low	
Env. Dam 2D2	Failure to Contain - Seepage	Harm to Humans	Low	The dam will have a small storage capacity and is not expected to contain water of high toxicity (haul road runoff). The consequences of seepage, overtopping or dam break failures are considered likely to be relatively minor.
		General Environmental Harm	Low	
		General Economic Loss or Property Damage	Low	
	Failure to Contain - Overtopping	Harm to Humans	Low	
		General Environmental Harm	Low	
		General Economic Loss or Property Damage	Low	
	Dam Break	Harm to Humans	Low	
		General Environmental Harm	Low	
		General Economic Loss or Property Damage	Low	
Dam 4	Failure to Contain - Seepage	Harm to Humans	Low	<p>Dam 4 will receive runoff from the haul road and Rail Loadout which is likely to have elevated concentration of coal fines, hydrocarbons and metals.</p> <p>Overtopping or dam break failure of the dam may result in material environmental harm to the receiving environment.</p> <p>Seepage impacts are expected to be relatively minor as a result of the small footprint and low height of the dam and the dilution capacity of the receiving groundwater system.</p>
		General Environmental Harm	Low	
		General Economic Loss or Property Damage	Low	
	Failure to Contain - Overtopping	Harm to Humans	Low	
		General Environmental Harm	Significant	
		General Economic Loss or Property Damage	Low	
	Dam Break	Harm to Humans	Low	
		General Environmental Harm	Significant	
		General Economic Loss or Property Damage	Low	

Structure	Scenario	Category of Harm	Consequence Category	Determination
Flood Protection Levee	All	Harm to Humans General Environmental Harm General Economic Loss or Property Damage	Significant	Failure of the flood protection levee under flooding conditions will result in the inflow of large volumes of clean water into Dam 1 and Open Cut 2 which would likely overwhelm the mine water containment system, impact the mining operations and potentially cause Dam 1 to fail and release its contents into the downstream receiving environment.

CONCLUSION

The overall outcomes of the preliminary consequence category assessment are summarised in Table 4. All dams with the exception of Environmental Dams 2D1 and 2D2 are considered likely to be classified as regulated structures primarily due to the potential environmental consequences of the dams releasing water into the receiving environment in the event of an overtopping or dam break failure.

The flood protection levee is also considered likely to be classified as a regulated structure since failure of the levee is expected to overwhelm the mine water containment system and result in corresponding loss of containment of mine affected water.

Final certified consequence category assessments will need to be undertaken during the detailed design of the structures.

Table 4: Preliminary Consequence Category Assessment Outcomes

Structure	Overall Consequence Category	Regulated Structure
Dam 1	High	Yes
Env. Dam 1B	Significant	Yes
Env. Dam 1C	Significant	Yes
Env. Dam 2D1	Low	No
Env. Dam 2D2	Low	No
Dam 4	Significant	Yes
Flood Protection Levee	Significant	Yes

REFERENCES

Central Queensland Coal (2017a). Environmental Impact Statement – Central Queensland Coal Project. Chapter 10 – Groundwater.

Central Queensland Coal (2017b). Environmental Impact Statement – Central Queensland Coal Project. Chapter 16 – Matters of National Environmental Significance.

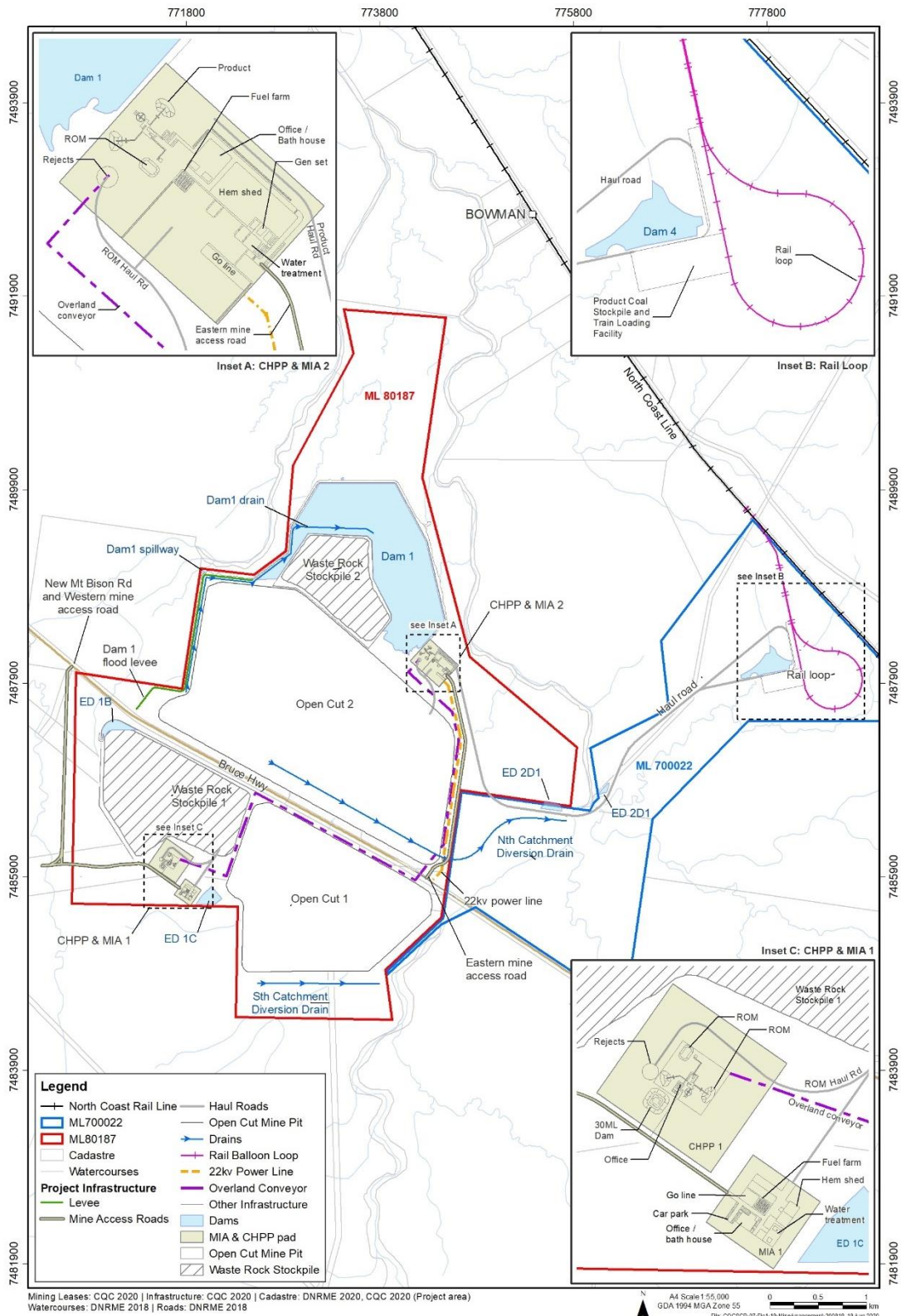
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HydroAlgorithmics (2020). Numerical Groundwater Model And Groundwater Assessment Report For The Central Queensland Coal Project. Supplementary Environmental Impact Statement Version 3 – Responses to Submissions. Version 5. July 2020.

WRM (2020). Flood Study and Site Water Balance Technical Report – Central Queensland Coal Project. 1596-01-E4. 26 August 2020.

Appendix A: Mine Layout Plan



Disclaimer

This memo has been prepared on behalf of and for the exclusive use of Central Queensland Coal and is subject to and issued in accordance with Central Queensland Coal instruction to Engeny Water Management (Engeny). The content of this memo was based on previous information and studies supplied by Central Queensland Coal

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