	volume of unallocated water available. (2) This register must be updated after the granting of a water entitlement.		
Section 32	**32 Unallocated water reserves** (1) Unallocated water is reserved in the following reserves— (a) general reserve; (b) strategic reserve; and (c) SunWater reserve. (2) The strategic reserve includes a volume of unallocated water for each of the following— (a) state purposes; (b) a future raising of the Burdekin Falls Dam of not more than 2 metres; and (c) water infrastructure for the Bowen and Broken subcatchments, that is primarily intended for industrial use. (3) At the time of plan commencement, the total volume of each reserve for each subcatchment area detailed in schedule 2 of the Water Resource (Burdekin Basin) Plan 2007 is shown in— (a) for reserves from which the chief executive may grant a water allocation or a water licence under Part 2, Division 3—Table 1; (b) otherwise—Table 2.		The Burdekin Basin WP manages and provides for the granting of unallocated water from the strategic reserve under a process in the Burdekin Basin ROP. The Burdekin Basin ROP defines the general and strategic reserves for each subcatchment in the plan area. There is currently 20,000 ML of strategic reserve for State purpose set aside under Part 2, Division 3, Table 1 of the Burdekin Basin ROP
Section 37	**Scope of Division 3** This division applies to— (a) unallocated water held as general reserve; and (b) unallocated water held as strategic reserve for		The proposed release of unallocated water relates to unallocated water in the strategic reserve to be used for state purposes.

	state purposes.		
Section 38	**Process for granting unallocated water held as general reserve and strategic reserve for state purposes** The process for making unallocated water available is the process prescribed in Part 2, Division 1C of the Water Regulation 2002[8].		DNRM is undertaking the process in accordance with Part 2, Division 2 Subdivision 2 of the Water Regulation 2016.
Section 39	**Unallocated water product specification** (1) In subcatchment areas A and B unallocated water to which this division applies will be granted only under water allocations. (2) In subcatchment areas E, F and G, unallocated water to which this division applies will be granted only under water licences.		Any authorisations to be granted as a result of the proposed release of unallocated water in the strategic reserve from subcatchment area E will be granted only under a water licence.
Section 40	**Additional condition for water licences granted for particular state purposes** Water licences granted from the strategic reserve for the following state purposes must include a condition on the licence that the authorisation to take the water returns to the State on the conclusion of — (a) a project of State significance; or (b) a project of regional significance.		Any resultant water licence will be conditioned that the authorisation to take water will return to the State upon conclusion of the project of State significance.

[8] On 6 December 2016 the Water Regulation 2016 commenced, which replaced the previous Water Regulation 2002. Section 145 of the Water Regulation 2016 allows a reference in an Act or other document to the previous Water Regulation 2002 to be, if the context permits, be taken to be a reference to the Water Regulation 2016.

6. Conclusion and Specification

6.1 Conclusion of Review

A review of the matters under section 32 of the Burdekin Basin WP that the chief executive must consider in making a decision to release unallocated water from the strategic reserve in the Belyando-Suttor subcatchment area E, is set out above. The proposed water product specification for release has been informed by both hydrological and ecological review, based on the outcomes in the Burdekin Basin WP.

Based on these findings, the department considers that it is open for the chief executive (or authorised delegate) to find that they should decide terms of sale to release the unallocated water by a fixed price process, under Part 2, Division 2, Section 18 of the *Water Regulation 2016*, having regard to section 32 of the Burdekin Basin WP.

6.2 Water Product Specification

The water product specification for release and associated water licence conditions detailed below are for the purposes of the Terms of sale only i.e. these are specifications and conditions that are to be included in the terms of sale for the release of a specified water product.

Table 5 Water product specification for release of unallocated water

Licence Holder	Adani Infrastructure Pty Ltd ACN 606 764 827
Licence Duration:	The life of the Carmichael Mine project (upon surrender of Mining Leases 70441, 70505 and 70506)
Water Name:	The Suttor River (including the Belyando River Anabranch)
Water Code	120.01.06- Suttor River 120.01.06.25A- Belyando Anabranch
Nominal Entitlement (annual volumetric limit)	12,500 megalitres
Mean annual volume	10,800 megalitres
Maximum rate of take:	11,600 litres/second
Passflow threshold	2,592 ML/day at St Anns gauging station 120303A
Purpose:	Any
Activity Location:	Lot 3/SP278559

Schedule A conditions:

NIL

Schedule B conditions:

Interpretation

In this Licence:

a. A reference to a Condition shall be a reference to a Condition of this Licence;
b. Headings to conditions are for ease of reference only and shall not in any way affect the meaning of the conditions;
c. A reference to days or months is a reference to calendar days or calendar months;
d. A reference to the department is a reference to the Department of Natural Resources and Mines;
e. Reference to the conclusion of the Project is a reference to the surrender of Mining Lease 70441, Mining Lease 70505 and Mining Lease 70506;
f. The mean annual volume assigned from the strategic reserve for this water licence is 10,800 megalitres;
g. Words in the singular shall include the plural and vice versa;
h. ***Rate of take*** is a volume measured in litres per second; and
i. ***Published***, for the purposes of this licence is in accordance with the definition of *publish* in the *Water Act 2000*.

Entitlement

1. The taking of water under this authorisation is permitted only when the flow of water exceeds 2,952 megalitres per day at the Department's Gauging Station Suttor River at St Anns (120303A).
2. The daily volumetric limit may be taken under this licence is 830 megalitres.
3. Despite the expiry date specified on this water licence, water granted under this water licence is granted only for the life of the Carmichael Mine Project and the right to take the water returns to the State on the conclusion of the Project.

Metering

4. Water must not be taken under this authorisation unless a measuring device (telemetric meter) of a type approved by the chief executive to measure the volume of water taken and released is installed for:
    a. water taken from the Suttor River under this authorisation; and
    b. water released into the Belyando River Anabranch; and

c. water taken from the Belyando River Anabranch under this authorisation.

Monitoring Plan

5. On each occasion that water is taken from the Suttor River under this authorisation, the holder must record:
    a. the date and the time at the start and end of the period of take;
    b. the meter reading at the start and end of the period;
    c. the daily volume taken;
    d. the rate of take, and for each change in the rate of take:
        i. The date and time of the change; and
        ii. The new rate of take.
6. Such records must be published within 5 business days of the end of each month by the licence holder and made available upon request of the chief executive.
7. On each occasion that water is released into the Belyando River Anabranch for the purpose of relift under this authorisation, the holder must record:
    a. the date and the time at the start and end of the release period;
    b. the meter reading at the start and end of the period;
    c. the daily volume released;
    d. the release rate, and for each change in the release rate:
        i. The date and time of the change; and
        ii. The new release rate
8. Such records must be published within 5 business days of the end of each month by the licence holder and made available upon request of the chief executive.
9. On each occasion that water is taken from the Belyando River Anabranch under this authorisation, the holder must record:
    a. the date and the time at the start and end of the period of take;
    b. the meter reading at the start and end of the period;
    c. the daily volume taken;
    d. the rate of take, and for each change in the rate of take:
        i. The date and time of the change; and
        ii. The new rate of take.

10. Such records must be published within 5 business days of the end of each month by the licence holder and made available upon request of the chief executive.

Relift requirements

11. Water taken from the Belyando Anabranch under this authorisation may only be taken:
    a. after water has been released or is being released into the watercourse by the water entitlement holder; and
    b. until a volume has been reached up to that volume that is released, minus losses.
12. Water being released into the watercourse must not:
    a. cause watercourse bank erosion or riparian destruction; and
    b. be released at a rate or total volume that will cause significant adverse effects on the ambient flows in the watercourse.

Appendix 1 DNRM Hydrologic Review Report

Appendix 2 DNRM Targeted Environmental Review Report

Targeted environmental review for specification of a water product for release of unallocated water from the strategic reserve in the Belyando-Suttor subcatchment area E of the Water Plan (Burdekin Basin) 2007.

Bernie Cockayne^, David Sternberg^, Gary Luck*

^ Land and Water Science, Water Services Central Region

Department of Natural Resources and Mines, Mackay

* Water Monitoring and Planning, Water Services Central Region

Department of Natural Resources and Mines, Mackay

Approvals Process (as per DNRM Science Publication Protocol)

Process	Delegated Officer	Date approved
Supervisors/Managers approval of intention to publish	Mr. Gary Jensen (A/Regional Manager, Water Services Central Region, DNRM),	3rd May 2016
Technical and Peer review#	Dr. Glenn McGregor (Principal Water Planning Ecology, DSITI)	2nd August 2016
Policy Review	Mr. David Crisp,(A/Senior Policy Officer, Water Planning, DNRM)	11th August 2016
Approved for release	Mr. Darren Moor (Executive Director, Central Region, DNRM)	
# any modifications to the report between the technical review and report finalisation were inconsequential to the technical content.		

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Executive Summary

Adani Infrastructure Pty Ltd (Adani Infrastructure) has provided a proposal to access unallocated water from the strategic reserve in the Belyando Suttor subcatchment area E of the Water Plan (Burdekin Basin) 2007 (Burdekin WP).[1] They propose to use this water for the construction and operation of the Carmichael Coal Project in the Galilee Basin and some rail construction (CDM Smith, 2015). Preliminary hydrological review by the Department of Natural Resources and Mines (DNRM) of Adani Infrastructure's originally proposed passflow thresholds (50ML/day and 200ML/day pass flow) indicated that there would be unacceptable adverse impacts on existing water entitlement holders downstream of the proposed point of take. DNRM has proposed specifications for a water product to be released that alleviates these adverse impacts.

The purpose of this report is to assess the potential risk to ecological processes of downstream floodplain lagoons from DNRM's proposed water product.

The primary outcomes from this targeted environmental review indicate that:

- The biodiversity values for the Scartwater wetland aggregation are unlikely to be adversely impacted by the proposed DNRM water product and therefore there is a low risk of impacting upon this wetlands DIWA listing as a wetland of national importance.
- Lagoons located in the lower parts of the floodplain show no increased risk through the DNRM proposed water product scenarios. Therefore there is unlikely to be any major changes to the environmental values these lagoons support.
- It has been identified that lagoons located higher on the floodplain will have a reduced number of filling opportunities and increased spells between these events with the DNRM proposed water product and further release of unallocated water (strategic and general) in the Suttor River below the Belyando junction. This location provides increased opportunity within subcatchment E and cumulative impacts of potential diversion are likely to impact lagoons located higher on the floodplain. This potentially indicates an additional risk not only to the lagoon aquatic ecosystems, but also to other long-lived floodplain water-dependent ecosystems (e.g. floodplain vegetation communities, including some of-concern and endangered remnant regional ecosystems). This potential risk is acceptable at this time, as the 130,000 ML/a general unallocated water reserve has not yet been accessed and the strategic reserve will also have a remaining volume (i.e. 9,200ML/a).

In any watercourse, the quality of refugial lagoons can be jeopardised due to extraction pressure associated with increasing water resource development without appropriate consideration of potential impacts. An increased risk of lagoon isolation during prolonged no-flow periods, and a decrease in filling flow would likely result in a reduced level and quality of available habitat, jeopardising the integrity of species which depend on the refuge. It is therefore recommended that any future release processes of unallocated water from this reach of the Belyando-Suttor subcatchment consider the risks highlighted in this review with mitigation strategies put into place.

[1] From the commencement of the *Water Reform and Other Legislation Amendment Act 2014* (WROLA) on 6 December 2016, the Water Resource (Burdekin Basin) Plan 2007 continues in force as a 'water plan' (see section 1256(1) of the Water Act).

Future monitoring and assessment activities, which will feed into the broader WP and planning assessment framework, should include better definition of the lagoon cease-to-flow and filling thresholds, further calibration of lagoon persistence modelling using DNRM field-data, and updated risk profiles to include stock and domestic use during no-flow spells.

1 Introduction

Adani Infrastructure has provided a proposal to access unallocated water from the strategic reserve in the Belyando-Suttor subcatchment area E of the Water Plan (Burdekin Basin) 2007. They propose to use this water for the construction and operation of the Carmichael Coal Project in the Galilee Basin and, some rail construction (CDM Smith, 2015). Adani Infrastructure proposes an average extraction of 10,800 ML/a (830 ML/day volumetric limit- DVL), with a maximum of 12,500 ML/a being sought from the Suttor River system from two extraction locations around the confluence of the Suttor River and the Belyando River Anabranch. Adani Infrastructure originally proposed that water extraction would initially commence at 50ML/day pass flow during the 1st wet season (1 December to 31 March the following year) and then with an increased passflow of 200ML/day from year 2 onwards. However, preliminary hydrological review by DNRM indicated that at these low passflow levels there would be unacceptable adverse impacts on existing water entitlement holders downstream of the proposed point of take. The majority of the existing entitlements are conditioned subject to a 2 cumec (175 ML/day) passflow at DNRM's Gauging Station 120303A Suttor River at St Anns. Allowing further access to water at lower passflow thresholds would adversely impact on the existing entitlement holder's ability to take water under their entitlement conditions. DNRM has proposed specifications for a water product to be released that alleviates these adverse impacts.

The DNRM proposed water product includes:

- Mean Annual Volume (MAV) - 10,800 ML/a
- Annual Volumetric Limit (AVL) - 12,500 ML/a
- DVL - 830 ML/day
- Max Rate 11,600 litres/second

2 Scope

The purpose of this report is to assess the potential risk to ecological processes of downstream lagoons from DNRM's proposed water product.

This targeted environmental review looks at the potential for the proposed water product conditions to create a significantly increased risk to the environmental values of refugial lagoons (e.g. water quality, habitat persistence) in the lower Suttor catchment.

The report does not assess the risk to instream ecological processes downstream of the proposed point of take as the conditions for DNRM's proposed water product are at a level that the instream process will not be impacted upon more than they are under existing entitlement conditions.

This report does not investigate potential impacts that may have occurred as a result of Adani Infrastructure's low passflow proposals (50ML/day and 200ML/day) as it has already been determined, as stated above, that the lower passflows would have unacceptable adverse impacts on existing water entitlement holders.

This report does not assess Adani's current proposal dated 27 October 2016, however the proposal is used to inform the review and specification of the water product for release. Assessment of applications related to the release of unallocated strategic reserve water will occur once Terms of Sale have been released.

3 Overview of existing ecological background

An initial DNRM desktop review of the potential impacts of the Adani Infrastructure proposal (50ML/day and 200ML/day pass flow) on downstream environmental assets (Appendix A) identified four (4) primary assets which are potentially at risk from the proposal. Of these, the floodplain wetlands and lagoons were prioritised for further assessment based upon their recognition as an ecological hotspot in what is a largely ephemeral river system and as the Scartwater Lagoon complex is listed as a DIWA nationally important wetland (EHP WetlandMaps, 2016). The reaches of the lower Suttor catchment are characterised by broad floodplains with anastomosing river channels and numerous permanent lagoons in anabranches and along off-river flood paths. Most of these lagoons have largely intact riparian vegetation assemblages and are an important permanent refuge for many aquatic species, such as fish, bird and invertebrate communities (Appendix A). These refugial lagoons are highly dependent on the flow regime to maintain ecologically significant processes and sustain environmental values (Figure 1). Flows are essential in maintaining lagoon volume and water quality, to flush and clear debris and sediment and provide longitudinal and lateral connectivity to facilitate dispersal of biota and trigger ecological responses (e.g. fish spawning). In any watercourse, the quality of refugial lagoons can be jeopardised due to extraction pressure associated with increasing water resource development without appropriate consideration of potential impacts. An increased risk of lagoon isolation during prolonged no-flow periods, and/or a decrease in filling flow would likely result in a reduced level and quality of available habitat, jeopardising the integrity of species which depend on the refuge (Figure 1).

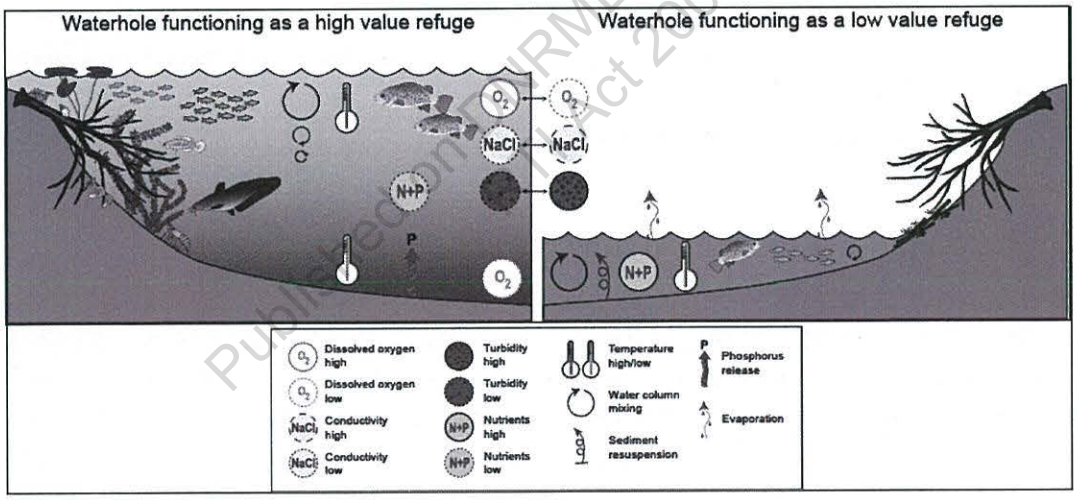

Figure 1: Conceptual model demonstrating the effects of flow on the environmental values of refugial waterholes (DSITI, 2016), which similarly applies to lagoons of the Lower Suttor.

4 Methods

The environmental risk assessment process used here characterises the risks from the DNRM's proposed water product scenario. This risk assessment will inform a broader assessment of Adani's preliminary proposal, which assesses the proposal against the assessment criteria and considerations under the Burdekin WP and Burdekin Basin Resource Operations Plan 2009[2] (Burdekin ROP) for the release of unallocated water.

The environmental assessment uses an ecohydraulic modelling approach, based on the principles of ecological risk assessment (ERA) to assess the risk to aquatic ecosystem components, processes, and services in these floodplain lagoons. The approach draws on existing information and knowledge of the ecological values of the lagoons as well as relevant flow-ecology information in the broader scientific domain.

4.1 Selection of assessment lagoons

The selection of lagoons for assessment was undertaken following a literature review of Burdekin Basin WP Technical Advisory Panel reports (Brizga *et al.* 2004; Brizga *et al.* 2005 a & b), Burdekin Basin WP Environmental Flows Assessment Program (EFAP) asset selection reports (Pollard, 2013) and published literature (Burrows *et al* 1999; Burrows *et al* 2007; Burrows *et al* 2009; Loong *et al* 2005; Maughan *et al* 2007; Pusey et al 1996). These lagoons were further prioritised based upon their known significance (i.e. Scartwater DIWA listed wetlands), geomorphic and volumetric representativeness, relative locations within the floodplain network as a means to represent the potential risk to the various flood magnitudes and those with known (albeit anecdotally) flooding thresholds.

4.2 Developing lagoon bathymetry

Bathymetric surveys (CEESCOPE™, CEE HydroSystems) were undertaken according to DNRM Aquatic Ecosystems Field Method WMO015a -Bathymetric surveys of waterholes. General ecological habitat and hydrographic observations were made for four (4) prioritised lagoons (see photos in Appendix B), with significant effort directed towards estimating cease-to-flow and the maximum flooding heights from the 2015/16 wet season. Both flow heights were measured against marks on trees and other fixed structures at several locations around the lagoons by all field staff, with general consensus providing the final river heights. It was not possible to determine lagoon filling thresholds using on-ground GPS survey techniques; therefore lagoon filling thresholds were estimated by subtracting the 2015/16 maximum flood mark and the cease-to-flow lagoon height from the recorded maximum height at St Anns (11/2/2016- 5.106m) (Figure 2). These filling thresholds were compared and verified against the anecdotal records (e.g. White & Klijn v. Qld government, 1998) and surrounding station managers' personal observations. Depth/temperature loggers (CTD-Diver, Schlumberger Water Services) were installed in the deepest sections of the lagoon with subsequent real-time flow data supporting the qualitative assessment of flooding thresholds and calibrated persistence models. Temperature loggers (HOBO 64k Pendant, Onset) were also installed in the upper

[2] The provisions of the Burdekin ROP are taken to be, or to have effect for, a number of other documents under the Water Act as amended by Water Reform and Other Legislation Amendment Act 2014 (WROLA) (see sections 1259 and 1264 of the Water Act). Section 1266 of the Water Act allows references to resource operations plans to, where the context permits, be taken to be a reference to the document that is relevant to the reference as specified under the Water Act as amended by the WROLA on 6 December 2016.

0.5m section of the lagoon to enable future assessments of possible lagoon stratification and subsequent flows required for destratification and therefore lagoon mixing.

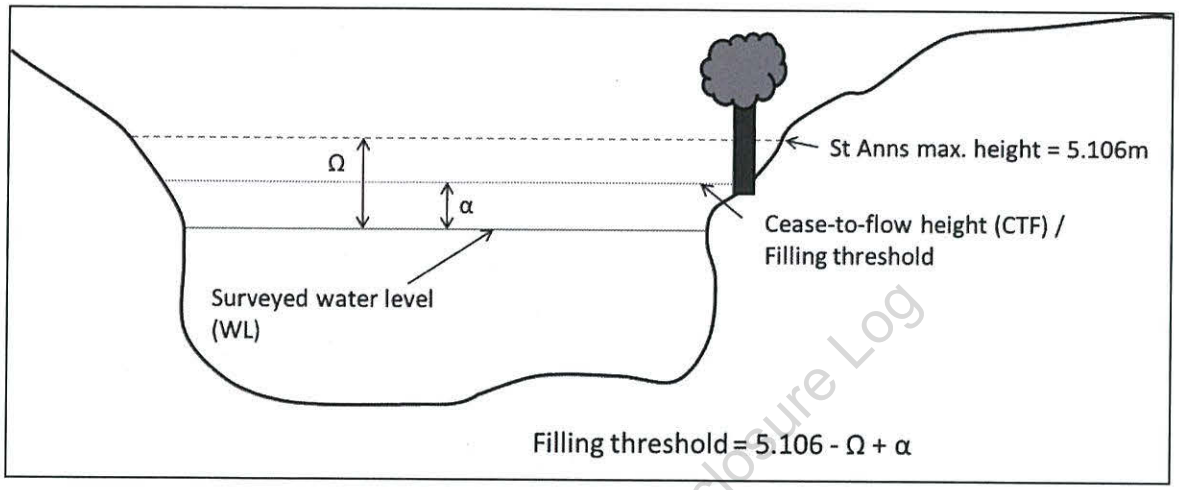

Figure 2: Conceptual diagram showing the method used to calculate the filling thresholds of each surveyed lagoon.

The survey data was processed following DNRM Aquatic Ecosystem Method AEML013- Post processing waterhole bathymetric survey data. Data editing was undertaken in CEEDATA (CEE HydroSystems), HYPACK 2015 ® (CEE HydroSystems) and Microsoft Excel (2010) and bathymetry maps and storage curves produced using ArcMap (Vers. 10.3) (Appendix C). Lagoon storage curves were standardised to the cease-to-flow height for subsequent data analysis.

4.3 Water use and licence scenario evaluation

The assessment followed the framework and methodologies outlined in the Water Planning Science Plan (DSITIA, 2014). Water use and licence scenarios were developed using IQQM for the pre-development, current entitlement, ROP base case and DNRM proposed water product at Node 306 (GS 120303a St Anns) (Table 1).

Table 1: Water entitlement scenarios tested.

Scenario (model number)	Description
Pre-development (001H#306)	Assumes no water resource development in the catchment.
Current Entitlement (CD_0R_X#306)	Includes full use of all entitlements current at the time of commencement of the Water Plan including the Burdekin/Haughton and Bowen/Broken water supply schemes, but does not include unallocated water reserves.
ROP Base (020R#306)	Includes full use of all entitlements current at the time of commencement of the Water Plan including the Burdekin/Haughton and Bowen/Broken water supply schemes and also includes all unallocated water reserves which are modelled as take at specified locations.
DNRM proposed water product (R_A3#306)	Includes full use of all entitlements current at the time of commencement of the Water Plan including the Burdekin/Haughton and Bowen/Broken water supply schemes and also includes all unallocated water reserves which are modelled as take at specified locations, including: • 10,800 ML/a MAV, 12,500 ML/a AVL a being modelled with 830 ML DVL and a passing rule at GS 120303A St. Anns passing flow rule of 2,592 ML/day. • 6,176 ML/a MAV and 8,050 ML/a AVL taken at 561.6 ML DVL with a passing flow rule at GS 120309a Mistake Ck at Twin Hills of 432 ML/d. • 206 ML/a MAV and 230 ML/a AVL taken at 3 ML DVL with a passing flow rule at GS 120301b Gregory Development Rd of 198.7 ML/d • The remaining 129,200 ML/a unallocated reserves are located immediately upstream of the St Anns (Node 306) at Node 335.

Two assessment endpoints, which represent environmental aspects of lagoon integrity, were evaluated for each lagoon using EcoModeller (Vers. 2.0.9) and River Analysis Package (Vers. 3.0.7.0), and included:

1. Maintenance of the hydraulic connectivity regime between floodplain lagoons and the Suttor River
   - Measured by the spells between filling and inundation flows (maximum and average values for each lagoon).
2. Provision of refugial lagoon habitat across the assessment area
   - Measured at the individual lagoon and catchment scale, the frequency with which the lagoons cease to function as an effective refuge.
   - A Threshold of Concern (ToC) was developed for each of the individual lagoons to identify periods of limited and poor quality habitat. Generally periods of small lagoon size and very shallow water depths represent a higher risk to aquatic ecosystems through extreme water temperature fluctuations, concentrations of toxicants, increased predation, food limitation and disease transmission (Waltham *et al.* 2013).

- At the individual lagoon scale, low risk periods occurred when lagoons contained more than 75% of their maximum size (i.e. surface area). Medium risk periods were between 25% and 75% of their maximum size; whilst high risk periods, when the lagoons cease to function as an aquatic refuge, were considered to be when less than 25% of the lagoon maximum size.
- At the catchment scale, low risk periods occurred when no lagoons were below 25% of their maximum size. Medium risk was when up to 2 lagoons were less 25% of their maximum size; whilst high risk periods at the catchment scale was when more than 2 lagoons were less than 25% of their maximum size.

5 Results

5.1 Floodplain Lagoon Hydraulic Connectivity

Lagoon filling thresholds varied between 3,404 and 52,877 ML/day (Table 2). Minor changes were observed between modelled flow scenarios for each of the metrics for the lagoons located lower in the floodplain (i.e. Murdering and Upper Scartwater Lagoons), which suggests that these lagoons are largely unaffected under any of the flow scenarios (Table 2).

For the floodplain lagoons with higher filling thresholds (i.e. Blackwater and Longweed lagoons) there were negligible differences observed between the pre-development and current entitlement scenarios; and likewise between the ROP and DNRM proposed water product scenarios. Compared against current entitlement, the number of filling events for the ROP and DNRM proposed water product scenarios reduced by between 19 to 25%. Similarly the mean duration between filling events increased by between 25 to 30%. The maximum spell length (number of days between events) in both lagoons significantly increased, with a 32% and 84% increase in spell duration at Blackwater and Longweed Lagoons, respectively. It is expected that increases in the length and frequency of long spells as observed at Longweed and Blackwater Lagoons are likely to present threats to the persistence of localised aquatic ecosystems.

Table 2: Number of events and the magnitude of spells between lagoon filling events under each of five (5) modelled flow scenarios. Percent change is relative to current entitlement.

Lagoon	Metrics	Modelled flow scenario			
		Pre-development	Current Entitlement	ROP base	DNRM proposed water product
Longweed (39,398 ML/day)	Number of filling events	135	133	101 (-24.1%)	100 (-24.8%)
	Mean spell (days)	304	309	395 (28%)	399 (29.3%)
	Max. spell (days)	2,413	2,413	4448 (84.3%)	4448 (84.3%)
Murdering (3,404 ML/day)	Number of filling events	455	438	438 (0%)	414 (-5.5%)
	Mean spell (days)	81	85	85 (0%)	91 (7.4%)
	Max. spell (days)	926	927	927 (0%)	1004 (8.3%)
Blackwater (52,877 ML/day)	Number of filling events	99	98	78 (-20.4%)	79 (-19.4%)
	Mean spell (days)	415	408	515 (26.3%)	509 (24.8%)
	Max. spell (days)	4,448	4,448	5850 (31.5%)	5850 (31.5%)
Upper Scartwater (15,552 ML/day)	Number of filling events	244	238	212 (-10.9%)	206 (-13.4%)
	Mean spell (days)	163	168	190 (13.1%)	195 (16.3%)
	Max. spell (days)	2,138	2,140	2141 (0%)	2141 (0%)

5.2 Lagoons as refugia

A summary of the lagoons morphological and hydrological features are provided in Table 3.

Negligible differences in risk profiles were observed between the pre-development and current entitlement scenarios; and likewise between the ROP and DNRM proposed water product scenarios (Figure 3). It is also noteworthy that the pre-development flow regime poses high risk to lagoon refugial quality at both the catchment and lagoon scale.

At the catchment scale, a noticeable increase in risk to lagoon refugial quality was observed under the two development scenarios (Figure 3a). The shift in risk generally tended towards a medium risk profile, with a smaller increase in high risk events. This highlights that, for the majority of the modelling period, there will be some lagoon refugial habitat available for aquatic ecosystems to persist during the very dry times.

The refugial quality of lagoons lower in the floodplain (i.e. Murdering and Upper Scartwater Lagoons) were found to be under no greater risk under any of the development scenarios assessed (Figure 3c and e). These results agree with the hydraulic connectivity assessment whereby the number of and duration of spells between lagoon filling events were largely unchanged under the development scenarios. However, at Longweed and Blackwater lagoons, which have higher filling thresholds, an increase in risk profile from low to high risk was observed, with between 7 to 10% increase in risk (Figure 3 b and d). For the most part this increase in risk profile is due to a very dry modelled period between 1928 and 1940, whereby a refilling event was observed halfway during this dry spell under the pre-development and current entitlement scenarios and not under the two development scenarios tested.

Table 3: Summary of morphological and bathymetric data for prioritised refugial lagoons (values at cease-to-flow level)

Waterhole	Location		Mean depth (m)	Max. Depth (m)	Surface Area (m^2)	Volume (ML)
Longweed lagoon	-21.401283°	146.864381°	1.7	4.0	138,945	214
Murdering lagoon	-21.367614°	146.880456°	1.5	3.6	83,464	79
Blackwater lagoon	-21.172577°	146.850358°	2	5.8	136,999	257
Upper Scartwater lagoon	-21.099898°	146.870024°	3.5	7.5	107,941	345

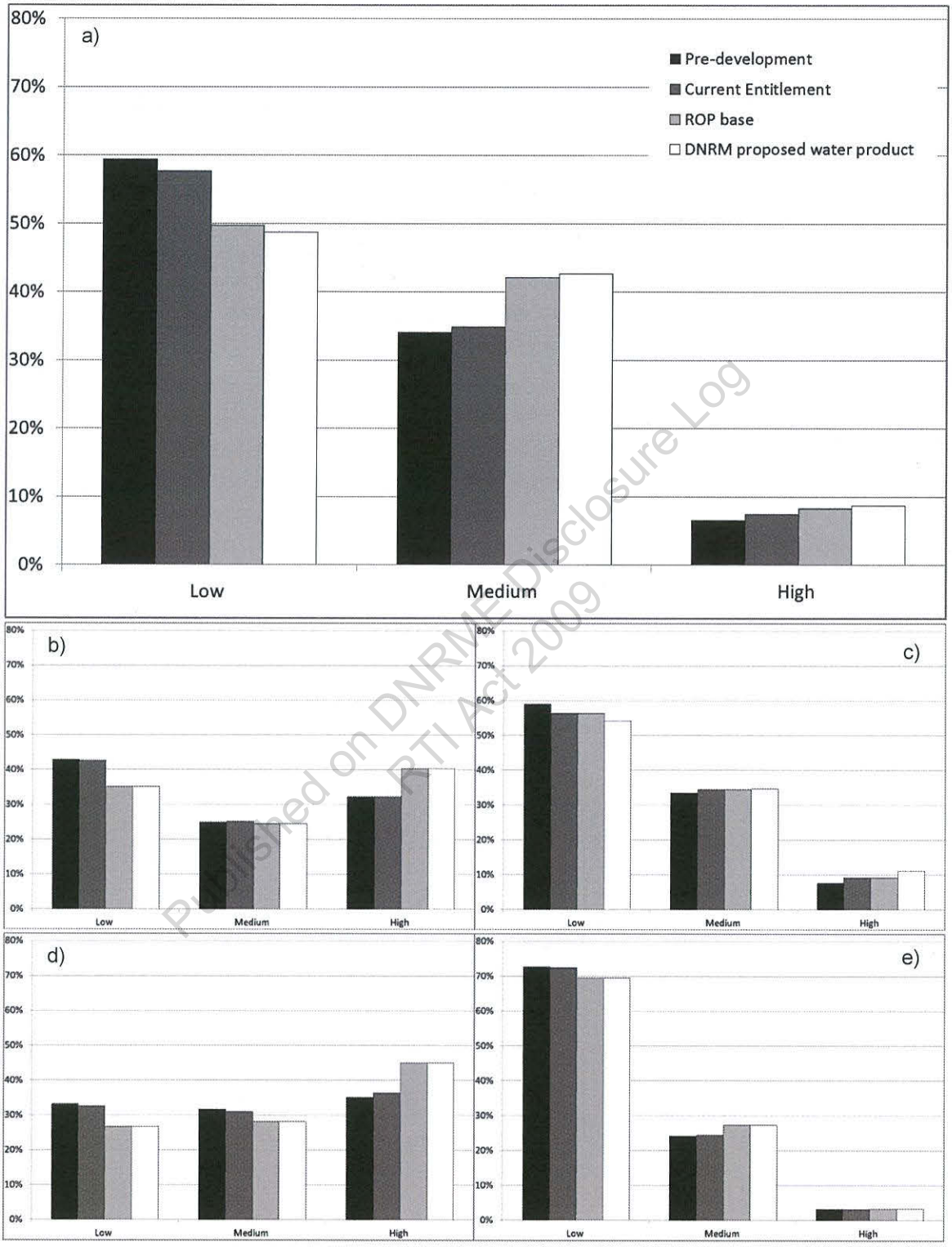

Figure 3: Comparative risk profile under four flow management scenarios for the lagoons as refugia at the catchment scale (a), Longweed Lagoon (b), Murdering Lagoon (c), Blackwater Lagoon (d) and Upper Scartwater Lagoon (e), expressed as the percentage of years

6 Summary

6.1 Primary outcomes

The primary outcomes from this targeted environmental review are:

- Current entitlement modelling, which is representative of full use of existing entitlements, is close to pre-development conditions and therefore poses little additional risk to the lagoon aquatic ecosystems.
- Lagoons located in the lower parts of the floodplain, namely Upper Scartwater and Murdering lagoons, showed no increased risk through the ROP and DNRM proposed water product scenarios; therefore there is unlikely to be any major changes to the environmental values these lagoons support.
- Importantly, the risk assessment highlights that the biodiversity values for the Scartwater wetland aggregation are unlikely to be adversely impacted by the proposed DNRM proposed water product and therefore there is a low risk of impacting upon this wetlands DIWA listing as a nationally important wetland.
- Under the ROP and DNRM proposed water product scenarios, lagoons in the upper parts of the floodplain, such as Blackwater and Longweed, will have a reduced number of filling opportunities and increased spells between these events. This potentially indicates an additional risk not only to the lagoon aquatic ecosystems, but potentially also to other long-lived floodplain water-dependent ecosystems (e.g. floodplain vegetation communities, including some of-concern and endangered remnant regional ecosystems).
- This potential risk is acceptable at this time, as the 130,000 ML/a general unallocated water reserve has not yet been accessed and the strategic reserve will also have a remaining volume (i.e. 9,200ML/a).

6.2 Future monitoring and assessment

Future monitoring and assessment activities, which will feed into the broader WP and ROP assessment framework, includes:

- Further work is required to better define the lagoon cease-to-flow and filling thresholds. Due to the anastomosing nature of the floodplain channels this would be best achieved using high resolution aerial survey techniques, such as LIDAR.
- Each of the persistence modelling requires further calibration using the data collected by the installed depth loggers. DNRM research in waterholes in adjoining catchments (i.e. upper Cooper catchment) has shown that waterholes lose water at a much higher rate than by evaporation alone (e.g. seepage, evapotranspiration); therefore increasing the risk to lagoon aquatic ecosystems (Cockayne, in prep).
- Stock and domestic use during no-flow spells may pose a significant additive impact to the risk profiles; particularly given the surveyed lagoons provide a primary source of stock and domestic water. This rate of take will be incorporated into the updating of the persistence models.

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Appendix A: Desktop Review of potential impacts of proposal on downstream environmental assets[3]

General Description

(taken from the Burdekin Basin Technical Advisory Panel, 2004)

The reaches below the Belyando–Suttor confluence (hereafter referred to as the lower Suttor) are characterised by broad floodplains with anastomosing river channels (Figure 1). There is typically a dominant main channel accompanied by anabranches, which may be old river courses or actively eroding new channels that are likely to eventually capture the main flow and become the dominant channel. Under flood conditions, flows are also carried by the anabranches and spread broadly across the floodplain, which includes the inundation of a number of natural wetlands and lagoons (see below).

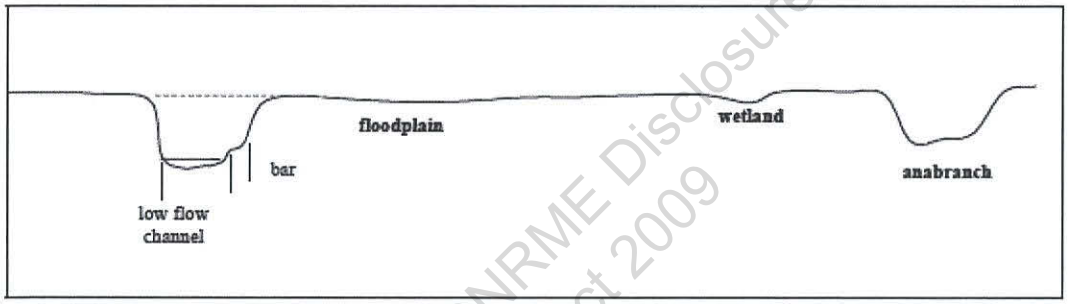

Figure 1: Typical cross-section of the channel type channel/floodplain below the Belyando/Suttor R. junction

Groundwater Resources

(taken from the Burdekin Basin Technical Advisory Panel, 2004)

Groundwater occurs in shoestring sand aquifers within the alluvium of the lower Suttor. Groundwater flow in the aquifers closely conforms to surface water flow within the main channel. There is little groundwater resource development in this catchment and consequently few, if any, impacts on GDEs are expected.

Surface Water Resources

(taken from the Burdekin Basin Technical Advisory Panel, 2004)

The lower Suttor River is naturally intermittent and ephemeral. A large proportion of the annual discharge occurs as flood flows, mainly during the wet season between December and April. There is no major water infrastructure in this catchment upstream of the Burdekin Falls Dam pondage. Water is extracted from the rivers for stock and domestic use, and irrigation purposes. Extraction predominantly occurs as waterharvesting into off-stream storages during flood periods, although some extraction from waterholes and lagoons occurs during dry periods. The flow duration curve (Figure 2) highlights the ephemeral nature of the

[3] Note, this desktop assessment was completed pre-WROLA.

lower Suttor River; under the ROP base case scenario, a reduction in river flow relative to pre-development conditions is evident.

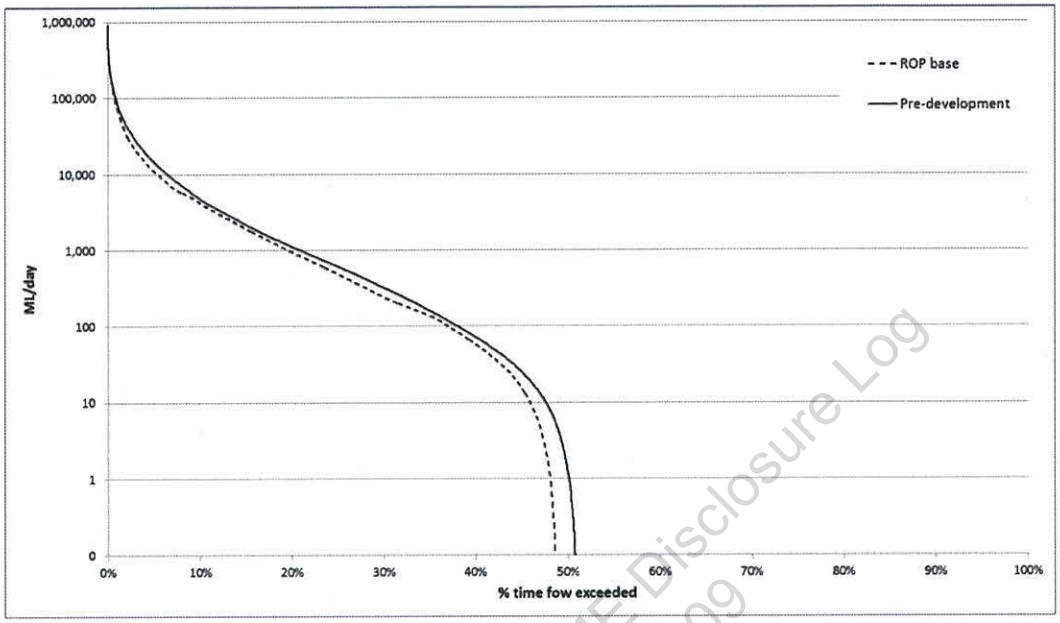

Figure 2: IQQM modelled flow duration curves for Suttor River at St Anns.

Overall current environmental condition

(taken from the Burdekin Basin Technical Advisory Panel, 2004)

Current conditions of the lower Suttor show only minor change from reference condition for most ecosystem components, and moderate changes to water quality and macroinvertebrate assemblages, primarily as a result of land use pressures (although limited datasets offer low confidence in this assessment). The primary impacts of human activities include grazing within riparian zones and stream condition.

Potential downstream impacts to Environmental Assets

There have been few research programs undertaken on aquatic ecosystems in any of the Belyando/Suttor catchments, and as a result little is known about the critical flow requirements of environmental assets within the area. There is currently no Environmental Flows Assessment Program (EFAP) monitoring underway in the catchment. Despite this there are several environmental assets which are potentially at risk through future water resource developments, as detailed below.

Floodplain Wetlands and Lagoons

The lower Suttor contains numerous permanent lagoons in anabranches and along off-river flood paths. Most of these lagoons have largely intact riparian vegetation assemblages and are productive fish habitats (Burrows et al 1999; Burrows et al 2009). The anabranches and off-river lagoons are characterized by different habitats to the main channels, usually consisting of different riparian vegetation assemblages (typically more coolabahs than paperbarks and river redgums), greater in-stream leaf litter inputs and more aquatic macrophytes, thus providing valuable diversification of habitat types in a system that is otherwise relatively uniform. The broad floodplains provide extensive temporary (albeit productive) wetland habitat during flood events.

There are no wetlands or lagoons within the lower Suttor listed under Ramsar as internationally important wetlands; however, the Scartwater wetland aggregation is listed as a DIWA nationally important wetland (EHP *WetlandMaps*, 2016). The Scartwater wetland aggregation (-21.096934, 146.870582) covers an area of approximately 332 hectares and includes Suttor River, seasonal and permanent lagoons and wetlands (e.g. upper and lower Scartwater Lagoons) and freshwater vegetated swamps (DotE, 2016). The Scartwater wetland aggregation was listed as a DIWA nationally important wetland as it provides a good example of a wetland type occurring within the Brigalow Belt North bioregion (DotE, 2016). Furthermore, it contains biodiversity values that are consistent with the criteria for listing an important DIWA wetland (DotE, 2016). Little quantitative data exists relating to the flows necessary for filling the Scartwater lagoons; however, a 1998 land court ruling highlighted that a flow at the St. Anns gauge of 2.22m (est. 140 cumecs) (3.6m at Scartwater crossing) was sufficient to fill Scartwater Lagoon and a height of 2.39m (est. 170 cumecs) at St. Anns would be sufficient to both fill and flush the lagoon (White & Klijn v. Qld government, 1998). These river height thresholds have not yet been verified by an on-ground field survey.

Other notable floodplain lagoons and wetlands in the area include:

- Blackwater lagoon (-21.172384, 146.85039) - a large (approx. 15 ha) permanent floodplain lagoon located approx. 6km upstream of Scartwater Lagoon. Little is known of this lagoon, except that previous riparian vegetation condition surveys rated the lagoon in B (good) ecological condition (Burdekin Basin Technical Advisory Panel, 2004).
- Packsaddle Waterhole (-21.159152, 146.879261) – smaller waterhole (approx. 3ha) close to the main river channel and approx. 5km upstream of Scartwater lagoon. There's no published information relating to this waterhole; however long-term LandSat imagery indicates that the waterhole is mostly permanent.
- Longweed Lagoon (-21.39549, 146.86503) - located 10km downstream of the Belyando/Suttor junction, Longweed Lagoon is filled by overflow from the Suttor River or from its own catchment area on Vine Creek. The lagoon is likely to be important bird habitat as it's a permanent waterbody (Maughan *et al* 2007). This lagoon was studied as a part of a limnological assessment and benchmarking of key sentinel wetlands of the Burdekin catchment (Loong *et al* 2005), with the key findings showing the lagoon has a 2.1m maximum depth and was stratified for all measured WQ parameters (1.5-1.7m depth), with bottom waters appearing hypoxic.

Summary

The little information which exists for the lower Suttor floodplain wetlands and lagoons suggests that they are an important part of the aquatic ecosystem as they represent the last potential refuge in what is a generally ephemeral river system. Protection of the filling and flushing frequency and volumes would be required for their long-term maintenance as an aquatic refuge, particularly given the larger lagoons which are likely to be stratified for most parts of the year. The preliminary risk assessment of the proposed water harvesting licence application found that the Scartwater lagoons were found to have less filling and flushing opportunities under the proposed 50 and 200 ML/day pass flow thresholds. There were 7 years over the IQQM simulation period where likely inundation events (i.e. equivalent to 170 cumecs) observed in the pre-development case did not occur in the proposed 200 ML/day pass flow threshold scenario. Given these wetlands and lagoons are ecological hotspots (i.e. centres of higher biodiversity within the broader landscape), it would be recommended that a precautionary approach be taken to minimise impacts to the ecological processes of the lagoons.

Immediate monitoring to develop and/or confirm filling and flushing thresholds are recommended (see further details below in Proposed Monitoring Program to address key knowledge gaps).

Instream waterholes and other aquatic hydraulic habitat

A recent EFAP desktop assessment found that instream refugial waterholes were generally uncommon in the lower Suttor, with less than 3 waterholes considered permanent (pers. comm Michaelie Pollard). These included waterholes upstream and downstream of St Ann's gauging station and Murdering Lagoon, which occurs in a braided section of the Suttor River 22km upstream of St Ann's gauge. These waterholes were found to be generally smaller than the off-stream wetlands and lagoons, with their long-term persistence possibly influenced by alluvial groundwater inflow and impoundment due to small instream barriers (e.g. road causeways). Despite their low numbers and size, these waterholes have been identified as important habitats particularly for many of the larger fish species, such as the endemic small-headed grunter (*Scortum parviceps*), which has been found to only occur within instream waterholes (Burrows *et al* 1999).

Given the predominantly ephemeral nature of the lower Suttor River most other instream habitats, such as riffles, generally don't persist for significant lengths of time. However, when they do occur (gauged data at St Anns suggests it's for over 50% of time) they provide connectivity along the river channel, anabranches and floodplains, which have been identified as important for fish movement and the maintenance of fish communities (Burrows et al 2009). More details of the fish communities are provided below.

Summary

The Burdekin WRP General Ecological Outcomes specifically highlights the maintenance of Belyando/Suttor catchment waterholes and the importance of ensuring that river systems remain connected (both longitudinally and laterally) (Water Resource [Burdekin Basin] Plan 2007- Sections 13 and 23). There is however a paucity of data to enable an assessment of whether the proposed water harvesting licence application will affect flows required for instream environmental assets. It is probable that the proposed

Hydrologic review for specification of a Water Product for release of unallocated water from the strategic reserve in the Belyando Suttor subcatchment area E of the Water Plan (Burdekin Basin) 2007

Impacts to Environmental Flow Objectives, Water Allocation Security Objectives and existing Suttor River entitlements

December 2016

Queensland Government

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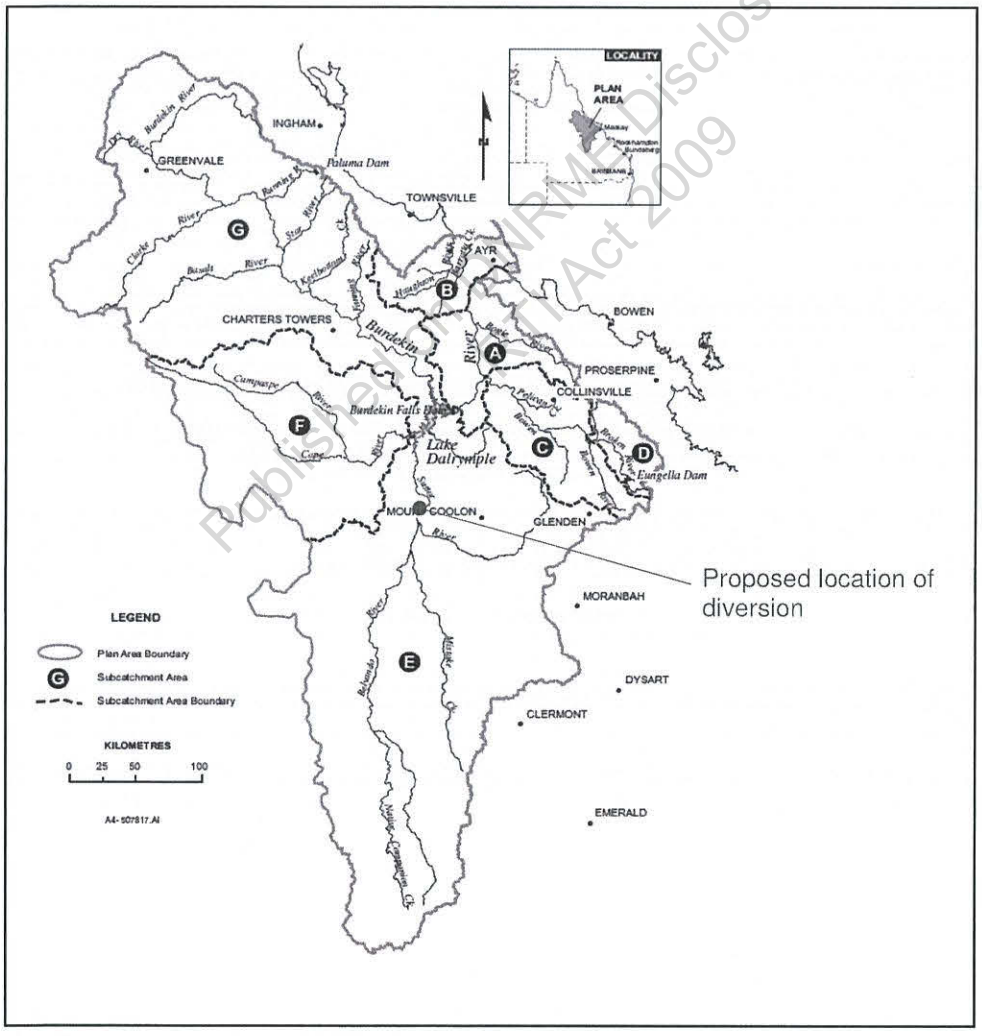
1 Introduction

Adani Infrastructure Pty Ltd (Adani Infrastructure) has provided a proposal to access unallocated water from the strategic reserve in the Belyando Suttor subcatchment area E of the Water Plan (Burdekin Basin) 2007[1].They propose to use this water for the construction and operation of the Carmichael Coal Project in the Galilee Basin and some rail construction in the Basin (CDM Smith, 2015). Adani Infrastructure has proposed to take water from the Suttor River as shown in Figure 1 with a nominal entitlement volume of 12 500 ML/a and a daily volumetric limit of 830 ML/day.

The proposed diversion includes a passing flow threshold of 2592 ML/day. Initial discussions included a passing flow threshold of 200 ML/day. The passing flow threshold is critical to the hydrological assessment for a proposed release of unallocated water as it has a high influence to ensure the water licence does not impact existing downstream entitlements and Water Plan (Burdekin Basin) 2007 (Burdekin WP) objectives are met. This hydrologic review report outlines how the passing flow threshold and other accompanying elements impact on downstream users and the Burdekin WP objectives.

Figure 1 – Burdekin basin and proposed location of diversion



[1] From the commencement of the *Water Reform and Other Legislation Amendment Act 2014* (WROLA) on 6 December 2016, the Water Resource (Burdekin Basin) Plan 2007 continues in force as a 'water plan' (see section 1256(1) of the Water Act).

2 Scope

The purpose of this report is to outline the potential impacts the proposed release of unallocated water in the form of a specified water product may have on existing downstream Suttor River entitlements. The strategic water release from subcatchment E must also meet the objectives outlined in the Burdekin WP.

To assess impacts the department's Integrated Quantity and Quality Modelling (IQQM) computer program has been used.

This report does not assess Adani's proposal, however the proposal is used to inform the review and specification of the water product for release. Assessment of applications related to the release of unallocated strategic reserve water will occur once Terms of Sale have been released.

3 Location of the Adani Infrastructure proposal

Adani Infrastructure's proposal is for the take of water from the Suttor River adjacent to property Lot 3 on SP278559 at an approximate AMTD 123 km just downstream from the junction of Suttor and Belyando Rivers.

Existing water licences on the Suttor River are conditioned with passflow requirements at St Anns gauging station 120303A at approximate AMTD 88.7 km.

Adani Infrastructure's proposal is approximately 34.3 km upstream from the St Anns gauging station.

3.1 Existing downstream entitlements

There are a total of six downstream existing water licences on the Suttor River that may be impacted by Adani Infrastructure's proposal. These entitlements are outlined in Appendix 1.

Water licence 55005A on the Belyando River Anabranch may be impacted depending on final approved diversion works. If Adani Infrastructure's proposal operates without interference in the Belyando River Anabranch, water licence 55005A will not be impacted in any way by the proposed works and diversion. However, if the approved works will cause interference with the Belyando River Anabranch, conditions can be applied to any water licence issued to ensure impacts to water licence 55005A will not occur.

4 Hydrologic assessment

The hydrologic assessment for the proposed diversion has been undertaken using the Integrated Quality Quantity Model (IQQM) and the simulation period 1890 to 2004 (114 years).

This report outlines the hydrologic results and potential impacts as determined using the IQQM.

4.1 IQQM representation of existing entitlements

The Suttor River entitlements downstream of the proposed diversion have been represented in the IQQM Base Scenario as detailed in Table 1. The IQQM node-link diagram of the assessed section of Suttor River is shown in Appendix 2.

Water licence 55005A with a nominal entitlement of 560 ML/yr has been represented as though the diversion is on the Suttor River.

Water licence 45019A with a nominal entitlement 430 ML/yr is only represented by an increased diversion rate in conjunction with water licence 96640A in IQQM node no. 292.

The existing entitlement representation in Burdekin ROP scenario *BH020R_A0* is considered appropriate for the assessment of impacts to Suttor River entitlements and no further modifications to the model representation were made. As the assessed scenarios have been derived from the Burdekin ROP Scenario *BH020R_A0* it is also considered appropriate for the assessment of the Burdekin WP water allocation security objectives (WASOs) and environmental flow objectives (EFOs).

Table 1 – IQQM existing Suttor River entitlement parameters

IQQM Node No.	Water licence No.	Nominal entitlement (ML per year)	Daily volumetric limit (ML per day)	Flow conditions[1]
291	*55005A*	*560*	*17.3*	*Nil*
292	*96640A*	*5570*	*484.0*[2]	*14 688 ML/day* *Or* *2592 ML/day and Burdekin Falls Dam greater than 1 000 000 ML*[3]
293	*52401A*	*2750*	*241.9*	*172.8 ML/day*
300	*52426A*	*3888*	*45.0*	*172.8 ML/day*
302	*57382A, 57383A & 57220A*	*1150*	*56.2*	*172.8 ML/day*

[1] All flow conditions for Suttor River diversions use the St Anns gauging station represented by IQQM node no. 306

[2] Includes rate of take for water licence 45019A.

[3] The condition has been simplified from the actual water licence condition for inclusion into the IQQM.

4.2 Other IQQM parameters

It is important to recognise the limitations of IQQM and how entitlements are represented to appreciate the results for specification of a water product for release.

Subcatchment streamflow routing and lag

Streamflow routing and lag time is typically only calibrated to a single link of an IQQM subcatchment reach. This occurs at the beginning of each subcatchment calibration reach and represents the entire subcatchment.

For this assessment, there are no routing or lag parameters represented in the IQQM Suttor River reach between the proposed diversion, downstream Suttor River entitlements and St Anns gauging station. Physically, this Suttor River reach is about 35 km long but the IQQM does not include any parameters to attenuate or lag the streamflow within this reach. The decision maker should consider physical routing and lag of streamflow that may occur within the reach being assessed in conjunction with results detailed in this review.

Subcatchment inflows

Similar to routing and lag of streamflow, subcatchment inflows are aggregated spatially and occur at specific locations within the model, and may not represent the actual spatial and temporal variance of inflows.

4.3 IQQM assessment scenarios

To assess the impacts of the proposed diversion, the IQQM scenario developed for the Burdekin ROP **BH020R_A0** was used. This scenario was modified to represent all existing entitlements in subcatchment E. This includes two water permits as outlined in Table 2 to establish a Base Scenario **BH020R_X0**.

Table 2 – Current water permits in Burdekin

IQQM Node No.	Watercourse	Water permit No.	Nominal entitlement *(ML per year)*	Daily volumetric limit *(ML per day)*	Flow conditions
362	*Belyando River*	*614136*	*250*	*3*	*The taking of water under this authorisation for construction purposes is permitted only during those periods when the flow of water in the Belyando River exceeds 2.3 cubic metres per second as indicated by the chief executive's gauging station at Gregory Development Road (120301B) on the Belyando River.*
363	*Mistake Creek*	*614017*	*8050*	*561.6*	*Pumping under the authority of this permit at the location adjacent to Lot 4 on SP116046 referred to as the Disney property, is prohibited whenever the flow in Mistake Creek downstream of the diversion sill authorised by water licence 57847F is less than 5 cubic metres per second. A flow of 5 cubic metres per second is equivalent to a diversion sill height of EL193.74. The sill height may be altered from time to time by the Chief Executive to reflect more accurately the prescribed surface flow.*

The proposed diversion scenarios for three different passflow conditions (200 ML, 1296 ML and 2592 ML) were assessed to provide indicative impacts to the existing Suttor River entitlements, WASOs and EFOs.

Table 3 – IQQM scenarios for assessment

Scenario ID	Reference name	Description		
BH020R_A0	ROP Scenario	Burdekin ROP scenario and base case for impact assessment to downstream entitlements.		
BH020R_X0	Base Scenario	Burdekin ROP scenario updated to represent current existing entitlements in subcatchment E with current water permits		
Inclusion of proposed diversion		**Nominal entitlement volume**	**Daily volumetric limit**	**Passflow conditions**
BH020R_X1	200 ML/day passflow	12 500 ML/yr	830 ML/day	200 ML
BH020R_X2	1296 ML/day passflow			1296 ML
BH020R_X3	2592 ML/day passflow			2592 ML

5 Results

5.1 Unallocated water reserve

The total unallocated water reserve (150 000 ML) for Burdekin subcatchment E is represented in the IQQM at the end of the Belyando-Suttor subcatchment system and can access streamflow occurring at St Anns gauging station. The location of the proposed diversion does not include contributing catchment from the Cape or Sellheim Rivers and is represented by IQQM node no. 335 as shown in Appendix 2.

As demonstrated by the plot shown in Figure 2 the proposed diversion exceeds the performance of the modelled total reserve;

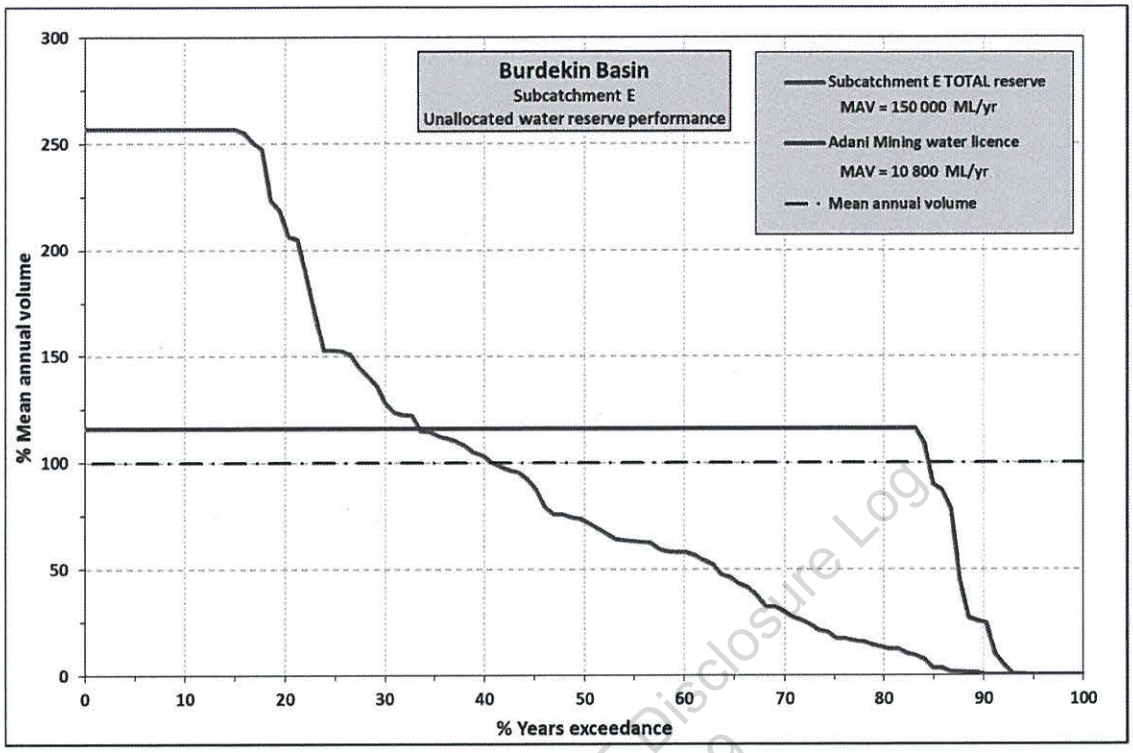
- in about 25% of years to divert 50% of the mean annual volume

and

- in about 43% of years to divert 100% of the mean annual volume.

Further releases of unallocated water in subcatchment E will not be able to continue with performances that exceed the performance of the planned reserve. This will reduce current margins of hydrologic performance that allow the plan objectives to be met.

Figure 2 – Percentage of mean annual volume of diversion exceedance probability



5.2 Environmental flow objectives

The proposed diversion will mostly impact on environmental flow objectives (EFOs) at Node 11 which is the nearest downstream reporting node. The Burdekin WP reporting nodes are illustrated in Schedule 1.

The low flow objectives and assessment for the proposed diversion are reported in

Table 4 below.

The medium to high flow objectives and assessment for the proposed diversion are reported in Table 5 below.

Table 4 – Low flow objectives

Node 11 **Suttor River at its confluence with the Burdekin River (AMTD 0.0km)** **Low flow objectives**			
Objective		**ROP Scenario**	**Proposed 2592 ML/day passflow scenario**
The percentage of the total number of days in the simulation period that the ***50% non-zero daily flow*** is equalled or exceeded be at least:-	32%	33%	33% ✓
The percentage of the total number of days in the simulation period that the ***80% non-zero daily flow*** is equalled or exceeded be at least:-	52%	53%	53% ✓
The percentage of the total number of days in the simulation period that the ***daily flow*** is zero be not more than:-	35%	33%	33% ✓
The number of ***periods of no flow*** of more than 1 month but not more than 6 months in the simulation period be not more than:-	118	118	118 ✓
The number of ***periods of no flow*** of more than 6 months in the simulation period be not more than:-	1	1	1 ✓

Definitions for low flow objectives

50% non-zero daily flow, for a node, means the daily flow, at the node, that is equalled or exceeded on 50% of the days on which there is a flow in the simulation period for the pre-development flow pattern.

80% non-zero daily flow, for a node, means the daily flow, at the node, that is equalled or exceeded on 80% of the days on which there is a flow in the simulation period for the pre-development flow pattern.

daily flow, for a node, means the volume of water that flows past the node in a day.

period of no flow, for a node, means a period in which the watercourse has ceased to flow at the node.

Table 5 – Medium to high flow objectives

Node 11 **Suttor River at its confluence with the Burdekin River (AMTD 0.0km)** **Medium to high flow objectives**				
Objective		**ROP Scenario**	**Proposed 2592 ML/day passflow scenario**	
The ***mean annual flow*** in the simulation period, expressed as a percentage of the mean annual flow for the pre-development flow pattern, be at least:-	92%	93%	93%	✓
The ***median annual flow*** in the simulation period, expressed as a percentage of the median annual flow for the pre-development flow pattern, be at least:-	88%	89%	88%	✓
The ***1.5 year daily flow volume*** in the simulation period, expressed as a percentage of the 1.5 year daily flow volume for the pre-development flow pattern, be at least:-	94%	95%	95%	✓
The ***5 year daily flow volume*** in the simulation period, expressed as a percentage of the 5 year daily flow volume for the pre-development flow pattern, be at least:-	96%	97%	97%	✓
The ***20 year daily flow volume*** in the simulation period, expressed as a percentage of the 20 year daily flow volume for the pre-development flow pattern, be at least:-	98%	98%	98%	✓
The ***annual proportional flow deviation*** be not more than:-	1.0	1.0	1.0	✓

Definitions for medium to high flow objectives

mean annual flow, for a node, means the total volume of flow, at the node, in the simulation period divided by the number of years in the simulation period.

median annual flow, for a node, means the annual flow volume, at the node, that is equalled or exceeded in 50% of years in the simulation period.

1.5 year daily flow volume, for a node, means the daily flow, at the node, that has a 67% probability of being reached at least once a year.

5 year daily flow volume, for a node, means the daily flow, at the node, that has a 20% probability of being reached at least once a year.

20 year daily flow volume, for a node, means the daily flow, at the node, that has a 5% probability of being reached at least once a year.

annual proportional flow deviation, for a node, means the statistical measure of changes to flow season and volume in the simulation period, at the node, calculated using the formula;

$$APFD = \sum_{j=1}^{p} \frac{\sqrt{\sum_{i=1}^{12} \left(\frac{c_{ij} - n_{ij}}{\bar{n}_i} \right)^2}}{p}$$

where—

p means the number of years.

c_{ij} means the modelled flow for month i in year j.

n_{ij} means the modelled natural flow for month i in year j.

$\bar{n}_i$ means the modelled natural flow for month i across p years.

5.3 Water allocation security objectives

The proposed diversion is upstream of the Burdekin Falls Dam and is highly likely to not have any impact on water allocation security objectives (WASOs) which are all located downstream of the dam or in disconnected systems. However, the WASOs have been assessed for the hydrologically connected Burdekin Haughton Water Supply Scheme (Supplemented) and the A1 (Lower Burdekin) water allocation group.

The supplemented water WASOs for Burdekin Haughton water Supply Scheme are reported in

Table 6 below.

The unsupplemented water WASOs for A1 (Lower Burdekin) water allocation group are reported in Table 7 below.

Table 6 – Supplemented water

Burdekin Haughton Water Supply Scheme			
Objective		**ROP Scenario**	**Proposed 2592 ML/day passflow scenario**
For water allocations in the high priority group, the ***annual supplemented water sharing index*** be:-	100%	100%	100% ✓
For water allocations in the medium priority group, the ***annual supplemented water sharing index*** be at least:-	90%	90%	90% ✓
For water allocations in the medium priority group, the ***monthly supplemented water sharing index*** be at least:-	95%	96%	96% ✓

Definitions for supplemented water allocation security objectives

annual supplemented water sharing index, for water allocations to take supplemented water in a particular priority group, means the percentage of years in the simulation period in which the allocations are fully supplied.

monthly supplemented water sharing index, for water allocations to take supplemented water in a particular priority group, means the percentage of months in the simulation period in which the allocations are fully supplied.

Table 7 – Unsupplemented water

Water allocation group - A1 (Lower Burdekin)			
Objective		**ROP Scenario**	**Proposed 2592 ML/day passflow scenario**
The ***30% unsupplemented water sharing index*** be at least:-	107%	107%	107% ✓
The ***50% unsupplemented water sharing index*** be at least:-	107%	107%	107% ✓
The ***70% unsupplemented water sharing index*** be at least:-	107%	107%	107% ✓
The annual volume probability be at least:-	85%	89%	89% ✓

Definitions for unsupplemented water allocation security objectives

30% unsupplemented water sharing index, for a group of water allocations, means the total volume of water simulated to have been taken annually under the allocations in at least 30% of years in the simulation period, if the allocations were in existence for the whole of the simulation period, expressed as a percentage of the simulated mean annual diversion for the allocations.

50% unsupplemented water sharing index, for a group of water allocations, means the total volume of water simulated to have been taken annually under the allocations in at least 50% of years in the simulation period, if the allocations were in existence for the whole of the simulation period, expressed as a percentage of the simulated mean annual diversion for the allocations.

70% unsupplemented water sharing index, for a group of water allocations, means the total volume of water simulated to have been taken annually under the allocations in at least 70% of years in the simulation period, if the allocations were in existence for the whole of the simulation period, expressed as a percentage of the simulated mean annual diversion for the allocations.

annual volume probability, for a group of water allocations, means the percentage of years in the simulation period in which the volume of water that may be taken by the group is at least the total of the nominal volumes for the allocations in the group.

5.4 Impacts to downstream Suttor River existing entitlements

Mean annual volume of diversion results from IQQM assessments are shown in Appendix 3.

Table 9 details the mean annual volume of the proposed diversion and downstream Suttor River entitlements for each scenario.

Table 10 details the annual probability of the proposed diversion and downstream Suttor River entitlements to achieve the mean annual volume diversion relative to each diversion and scenario.

Annual days of diversion opportunity results from IQQM assessments are shown in Appendix 5.

Table 11 details the mean annual number of days diversion opportunity for the proposed diversion and downstream Suttor River entitlements for each scenario.

Table 12 details the annual number of days diversion opportunity for the 80th percentile year for the proposed diversion and downstream Suttor River entitlements for each scenario. The 80th percentile year provides similar annual number of day opportunity for the Suttor River entitlements to achieve their nominal entitlement volume.

5.4.1 Discussion of impact assessment results

As expected, the 200 ML/day passflow threshold impacts on all of the downstream Suttor River entitlements. This is because the 200 ML/day passflow threshold intersects the streamflow opportunity of those downstream entitlements that have a passflow condition of 172.8 ML/day with a total daily diversion capacity of 343.1 ML/day of which only 27.2 ML/day (8%) is not impacted by the proposed upstream diversion. At this passflow threshold the proposed diversion could divert up to the full daily rate before the downstream water licence 96640A is permitted to access any flow and therefore there is some measured impact to mean annual volume of diversion. The impacts to the mean annual volume of diversion are low (less than 5%) due the typical high volume of water availability and due to the function of the nominal entitlement capping the annual diversions of each

entitlement. Measurable differences to annual volume of diversion generally only occur in years with a percentile of exceedance greater than 80%.

A proposed diversion with a passflow threshold of 1296 ML/day only indicates an impact to water licence 96640A. At this passflow threshold, it is above the combined 172.8 ML/day passflow condition and diversion capacity of the downstream entitlements. The impacts to the mean annual volume of diversion to water licence 96640A are very low (less than 1%). Interestingly, for water licence 96640A this scenario has a very minor improvement to the mean annual volume of diversion compared to the 200 ML/day passflow scenario. This is due to the function of the nominal entitlement capping of annual diversion volumes. In the 200 ML/d passflow scenario, the proposed diversion would reach the nominal entitlement earlier in a water year and cease diversion for the remainder of the year leaving water licence 96640A with opportunity to divert without available streamflow reduction from the upstream proposed diversion.

A proposed diversion with a passflow threshold of 2592 ML/day only indicates a very minor (less than 0.5%) impact to water licence 96640A. This minor difference is a result of the differences to the conditions between water licences 96640A and the proposed diversion. Water licence 96640A has additional conditions that further restrict diversion opportunity before diversion can occur at a common passflow condition of 2592 ML/day.

It is important to be aware that the IQQM annual volume of diversion results may not indicate impacts to diversion opportunity for downstream entitlements. All entitlements including the proposed diversion are represented in the scenarios as full entitlement or fully activated without further limitation. Diversion occurs at all times when the passflow conditions are met up to the nominal entitlement (annual volumetric limit) and daily volumetric limit. There is no representation of water use infrastructure (e.g. off stream storages and crop areas) that are likely to vary diversion behaviour in reality. Annual volume totals do not reflect the variations in time when water may be taken during the year and may not indicate impacts of opportunity to divert. To provide a measure of impacts to diversion opportunity the same scenarios were assessed with the nominal entitlement or annual cap of diversion volume removed from all Suttor River entitlements. The results of these scenarios are reported using annual number of days of diversion. These results outline that the impact of the proposed diversion may be perceived to be greater significant than the mean annual volumes of diversion indicate.

Similar to the mean annual volume of diversion results, a 200 ML/day passflow threshold for the proposed diversion impacts on all downstream Suttor River water licences. Up to an average of 26 annual days of pumping opportunity could be impacted for those downstream entitlements with a passflow condition of 172.8 ML/day and water licence 96640A could be impacted up to an average of 4 pumping days per year.

At both the 1296 ML/day and 2592 ML/day passflow conditions for the proposed diversion, the impacts only occur to water licence 96640A. On average up to 4 annual days of pumping opportunity will be impacted for the 1296 ML/day passflow threshold. On average up to 1 annual days of pumping opportunity will be impacted for the 2592 ML/day passflow threshold.

6 Recommendations for DNRM

1. The conditions of water licence 96640A should be revised before water is taken under any water licence (with a condition of 2592 ML/day) that is granted as a result of the proposed release of unallocated water from the strategic reserve. This could be done during the review of the Burdekin WP and ROP or through an alternate mechanism (eg. water permit) to ensure

the holder of water licence 96640A has equitable access to Suttor River flows. This review highlights that the additional conditions above the 2592 ML/day passflow condition could be removed without compromise to the Burdekin WP objectives. These additional conditions were included to protect the supply security of Burdekin Falls Dam and supply scheme entitlements at a time prior to establishment of the Burdekin WP objectives and the IQQM hydrological model. The IQQM can now be used to ensure the Burdekin WP objectives can be met with a 2592 ML/day passflow condition. A simplified passflow condition will also assist development of potential future water trading options.

2. The volumetric limit of diversion for water licence 52426A should be revised during the review of the Burdekin WP & ROP. This review does not indicate any impacts to water licence 52426A for a water product with a passflow condition of 2592 ML/day. However, for a water product with a 200 ML/day passflow condition, this review indicated that impacts to water licence 52426A were much greater than the other water licences with a 172.8 ML/day passflow condition. This is because water licence 52426A has a much lower ratio of daily volumetric diversion to nominal entitlement, requiring 86 annual days of diversion opportunity to achieve the nominal entitlement. Further release of strategic or general reserve unallocated water upstream in subcatchment E is likely to impact on water licence 52426A.

3. The department should consider developing guidelines for hydrologic assessment of strategic reserve unallocated water release. Assessment of impacts outside of the prescribed water allocation security objectives and environmental flow objectives can be subjective when addressing criteria in the general plan objectives. Results of this assessment highlight that impacts to existing downstream entitlements mean annual volumes of diversion may not present clear decisive differences as a result of high annual water availability in the majority of years. Guidelines for hydrologic assessment should assist proponents to address a variety of hydrologic water management criteria to ensure potential impacts to existing entitlements or environmental requirements are adequately assessed.

7 Conclusion

A summary of the water product proposed to be released and the performance as determined from IQQM modelling is shown in Table 8.

This review concludes that the Burdekin WP water allocation security objectives are met.

This review concludes that the Burdekin WP environmental flow objectives are met.

The proposed water product will have an impact on one downstream Suttor River water licence of 96640A. The impact is minimal however perceptually occurs as the licence conditions for the proposed water product provide greater access to occurring Suttor River flows than water licence 96640A. The passflow condition of 2592 ML/day is adequate in meeting downstream water requirements. It is therefore considered appropriate to support a passing flow condition of 2592 ML/day. However, in doing so the department should review how water licence 96640A can divert water with the same opportunity as the proposed water product as discussed in section 6 above.

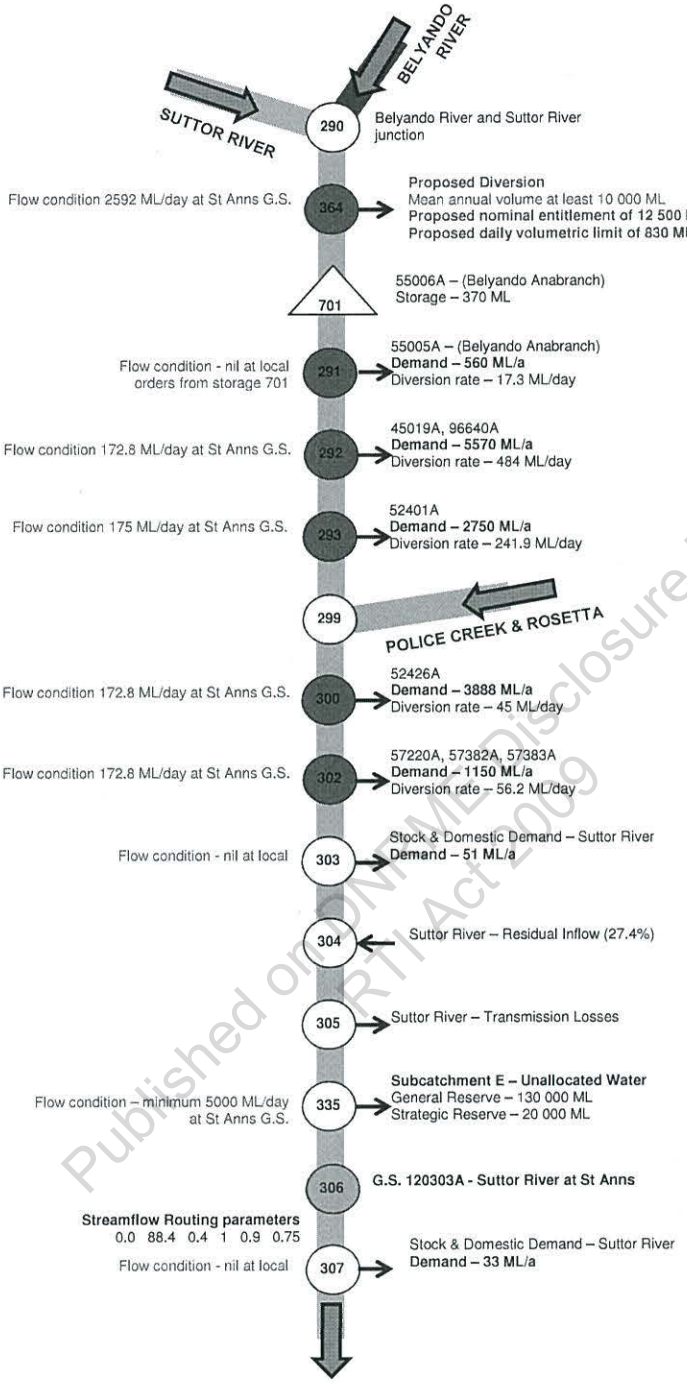
Table 8 – Proposed water product summary

Location	Suttor River Lot 3 on SP278559 approximate AMTD 123 km
Nominal entitlement volume	12 500 ML
Daily volumetric limit	830 ML
Passflow condition at St Anns gauging station 120303A	2592 ML/day
Assessed mean annual volume	10 890 ML/year
Assessed annual probability to achieve mean annual volume	84.2%

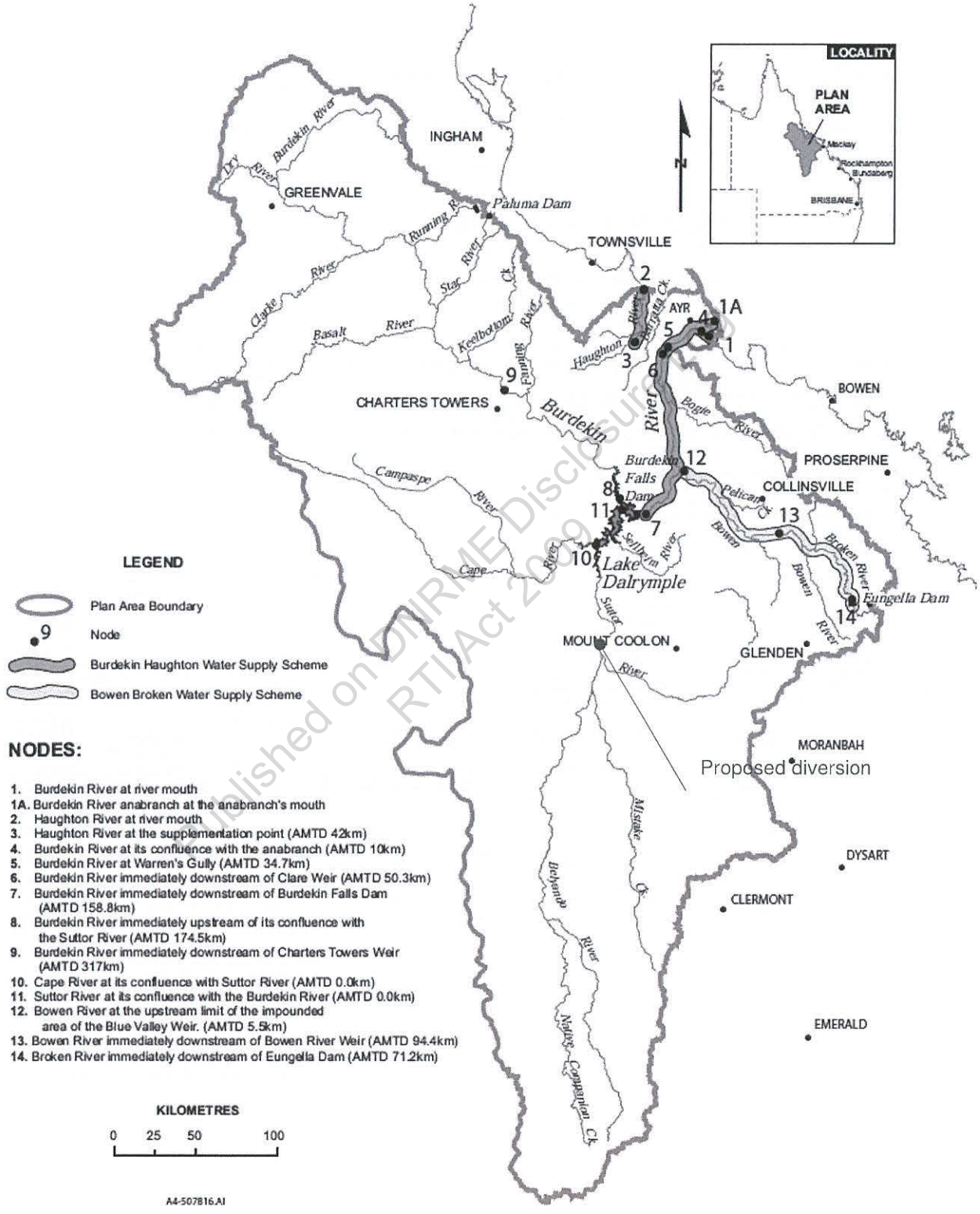
Appendix 1 Existing Suttor River entitlements

Licence No.	Water course and location	Nominal entitlement (ML per year)	Maximum rate (L per second)	Daily volumetric limit (ML per day)	Conditions
55005A	Belyando River Anabranch Lot 3 on SP278559	560	200	17.3	Water taken under this authorisation must only be water that has been impounded under the authority of water licence 55006A.
45019A	Suttor River Lot 3 on SP278559	430	70	6	Taking water from the impoundment authorised by licence 96644A is permitted only when the level in the impoundment is above the entrance to the outlet pipe.
96640A	Suttor River Lot 3 on SP278559	5570	5530	478	The taking of water under this authorisation is permitted only when the flow of water exceeds 14,688 megalitres per day at the Department's Gauging Station Suttor River at St Anns (120303A) or at such other times as the chief executive may permit. 1. Before commencing to take water at any time you are required to check the flow rate at St Anns gauging station with the chief executive and gain authorisation to take water. 2. Notwithstanding Schedule A condition 2.44, permission to take water at a lower flow level than 14,688 megalitres per day will be given only if all the following apply: a. There is continuous flow from the pump site to the storage of Burdekin Falls Dam; and b. The surface flow exceeds 2592 megalitres per day at St Anns gauging station; and c. In excess of 500,000 megalitres has passed St Anns gauging station in the preceding 12 months, or the Burdekin Falls Dam is full from other sources; and d. The Burdekin Falls Dam is storing more than 1,000,000 megalitres (54% of Stage 1 capacity); and e. Irrigators in the Burdekin Haughton Water Supply Scheme are not on less than 100% announced allocation; and f. Taking water will not adversely affect beneficial flooding on properties downstream to the Burdekin Falls Dam. 3. Notwithstanding the above conditions, taking of water from the impoundment authorised by licence 96644A is permitted provided that: a. There is no flow into the impoundment; and b. The preceding flow event exceeded a rate at which taking of water is permitted under this licence; and c. The storage level is not below the entrance to the outlet pipe on the impoundment. 4. Notwithstanding the above conditions, taking of water from the impoundment authorised by licence 55006A is permitted provided that there is no flow into the impoundment from the Belyando River.
52401A	Suttor River Lot 5078 on PH955	2750	2800	242	The taking of water under this authorisation is permitted only when the flow of water in the Suttor River exceeds 175 megalitres per day at the department's gauging station at St Anns (120303A).
52426A	Suttor River Lot 22 on SP218335	Nil	500	-	The taking of water under this authorisation for water harvesting purposes is permitted only during those periods when the flow of water in Suttor River at the pump site exceeds 2.0 cubic metres per second as indicated by the 1.04 metre mark on the gauge board at St Anns Gauging Station or at such other times as the chief executive or his district representative may permit..
57382A	Mining Lease 1095	Nil	100	-	The taking of water under this authorisation for water harvesting purposes is permitted only during those periods when the flow of water in Suttor River at St. Anns Gauge Station 120303A exceeds two (2) cubic metres per second as indicated by the mark established or to be established by the Chief Executive.
57383A	Mining Lease 1095	Nil	100	-	The taking of water under this authorisation for water harvesting purposes is permitted only during those periods when the flow of water in Suttor River at St. Anns Gauge Station 120303A exceeds two (2) cubic metres per second as indicated by the mark established or to be established by the Chief Executive.
57220A	Mining Lease 1095	Nil	450	-	The taking of water under this authorisation for water harvesting purposes is permitted only during those periods when the flow of water in Suttor River at Anns Gauge Station 120303A exceeds two (2) cubic metres per second as indicated by the mark established or to be established by the Chief Executive.

Appendix 2 IQQM Model – Node diagram for Suttor River



Appendix 3 Plan area



Appendix 4 IQQM results – Mean annual volume of diversion

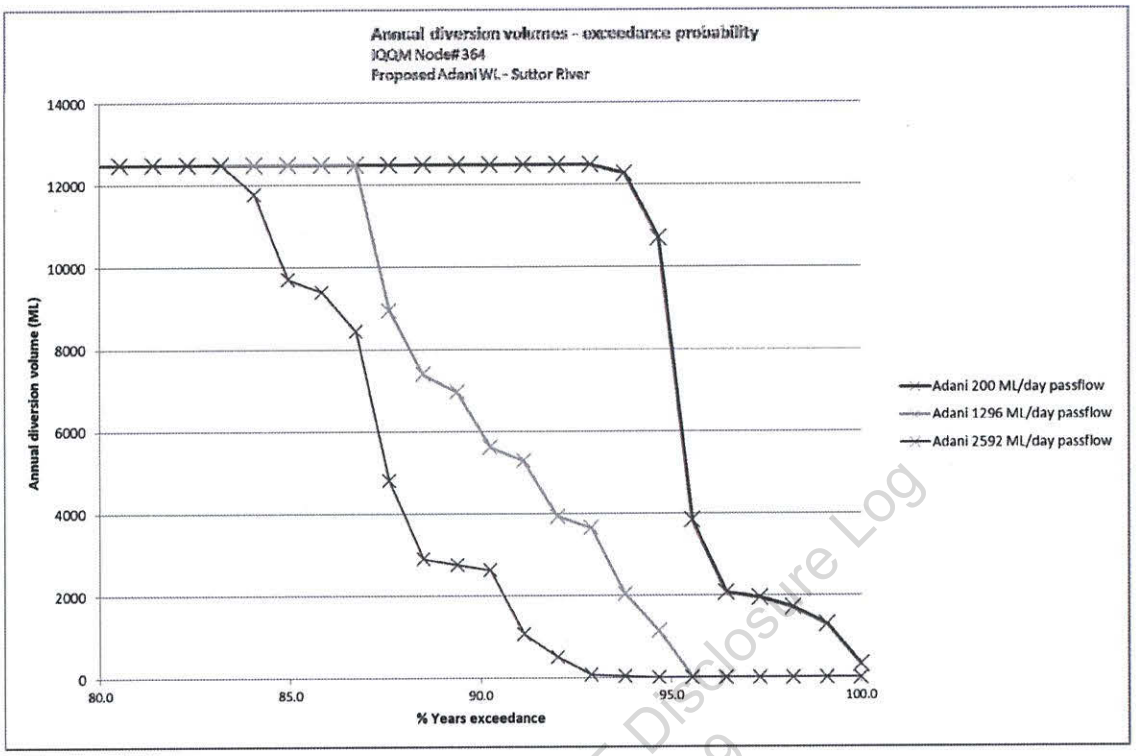
Table 9 – Hydrologic assessment results – mean annual volume of diversion

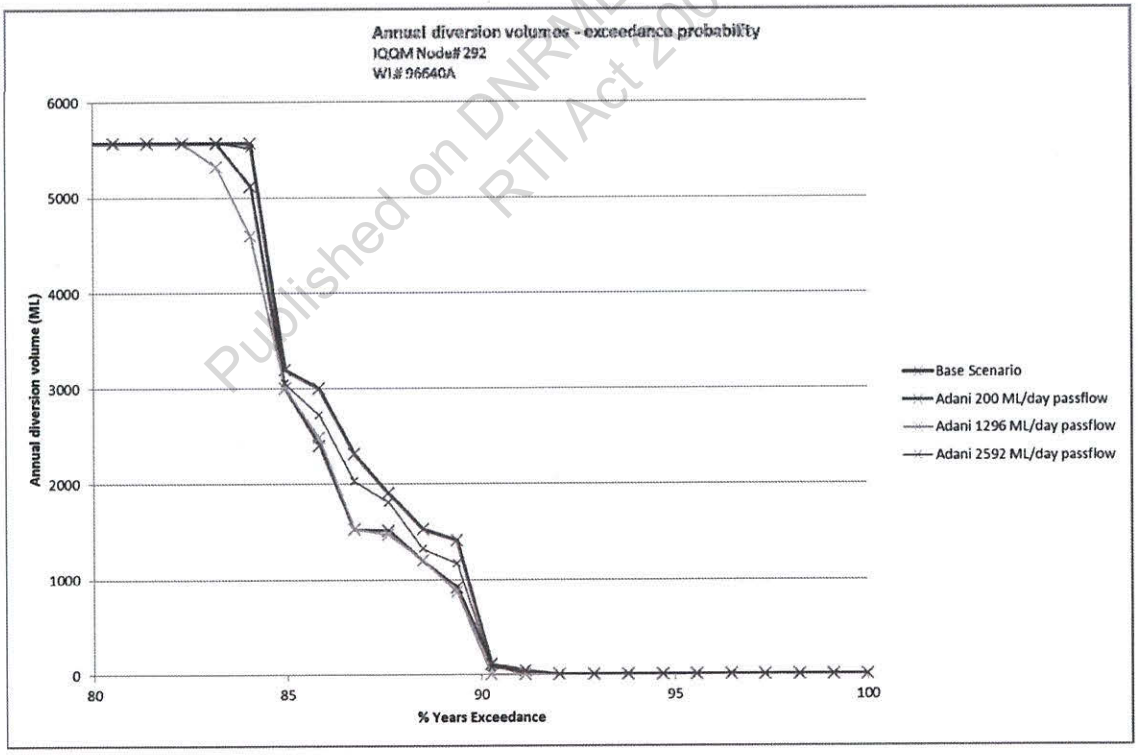
Water product details			Base scenario	200 ML/day passflow condition		1296 ML/day passflow condition		2592 ML/day passflow condition	
IQQM Node No.	Suttor River water licence	Nominal entitlement volume (ML/water year)	Mean annual volume (ML/water year)	Mean annual volume (ML/water year)	change from Base scenario %	Mean annual volume (ML/water year)	change from Base scenario %	Mean annual volume (ML/water year)	change from Base scenario %
364	proposed diversion	12500	-	11925	-	11250	-	10890	-
291	55005A *Belyando anabranch*	560	555	555	*0.0%*	555	*0.0%*	555	*0.0%*
292	96640A	5570	4810	4780	*-0.6%*	4770	*-0.8%*	4795	*-0.3%*
293	52401A	2750	2685	2655	*-1.1%*	2685	*0.0%*	2685	*0.0%*
300	52426A	3888	3515	3445	*-2.0%*	3515	*0.0%*	3515	*0.0%*
302	57382A, 57383A & 57220A	1150	1120	1100	*-1.8%*	1120	*0.0%*	1120	*0.0%*

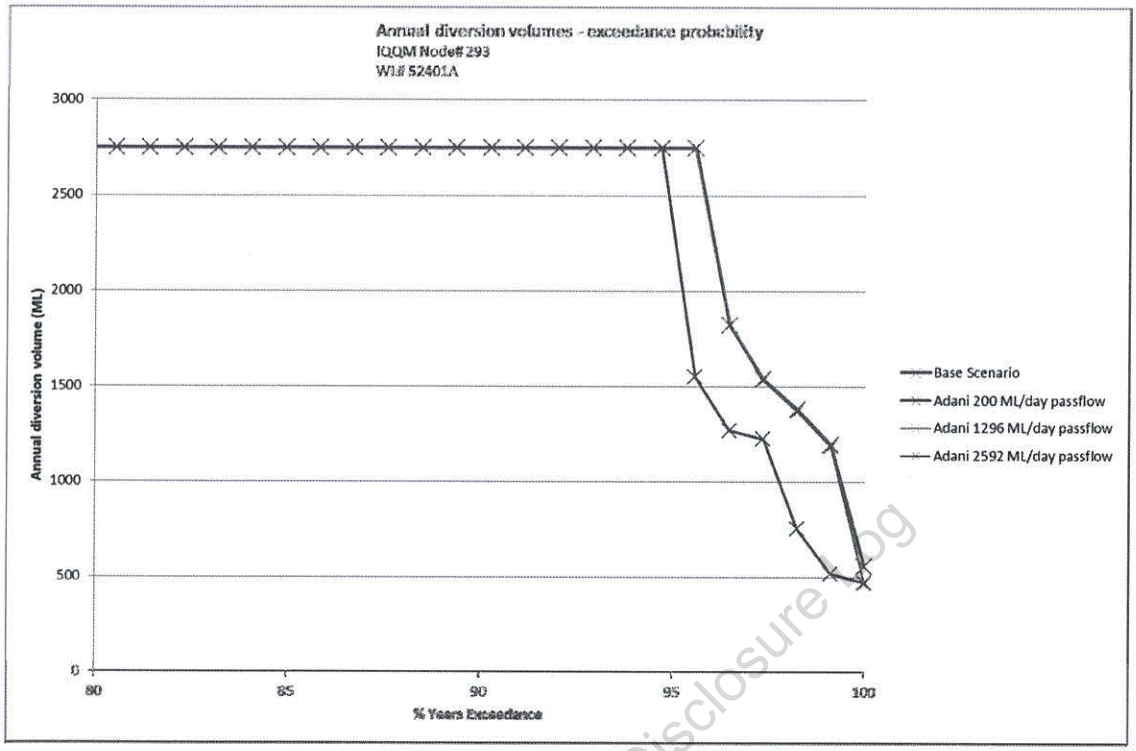
Table 10 – Hydrologic assessment results – mean annual volume of diversion probability

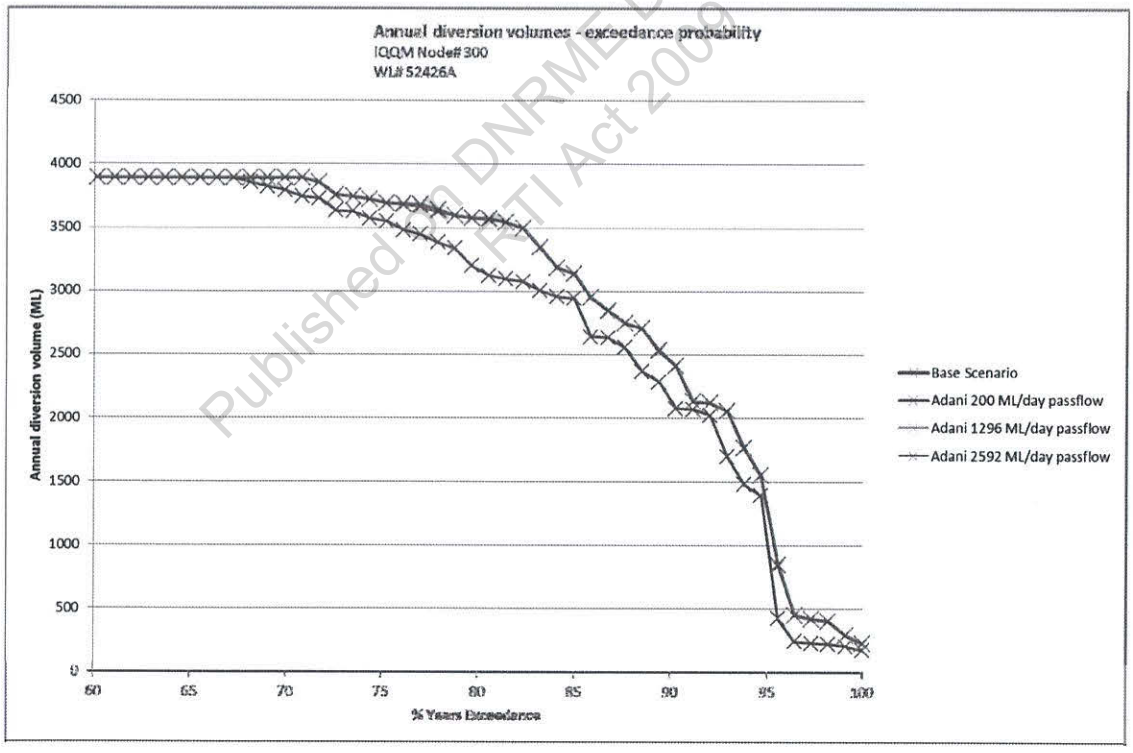
Water product details			Base scenario	200 ML/day passflow condition		1296 ML/day passflow condition		2592 ML/day passflow condition	
IQQM Node No.	Suttor River water licence	Nominal entitlement volume (ML/water year)	Mean annual volume probability (ML/water year)	Mean annual volume probability (ML/water year)	change from Base scenario %	Mean annual volume probability (ML/water year)	change from Base scenario %	Mean annual volume probability (ML/water year)	change from Base scenario %
364	proposed diversion	12500	-	93.9%	-	86.8%	-	84.2%	-
291	55005A *Belyando anabranch*	560	96.5%	96.5%	0.0%	96.5%	0.0%	96.5%	0.0%
292	96640A;	5570	84.2%	84.2%	0.0%	83.3%	-0.9%	84.2%	0.0%
293	52401A	2750	95.6%	94.7%	-0.9%	95.6%	0.0%	95.6%	0.0%
300	52426A	3888	82.5%	78.1%	-4.4%	82.5%	0.0%	82.5%	0.0%
302	57382A, 57383A & 57220A	1150	94.7%	94.7%	0.0%	94.7%	0.0%	94.7%	0.0%

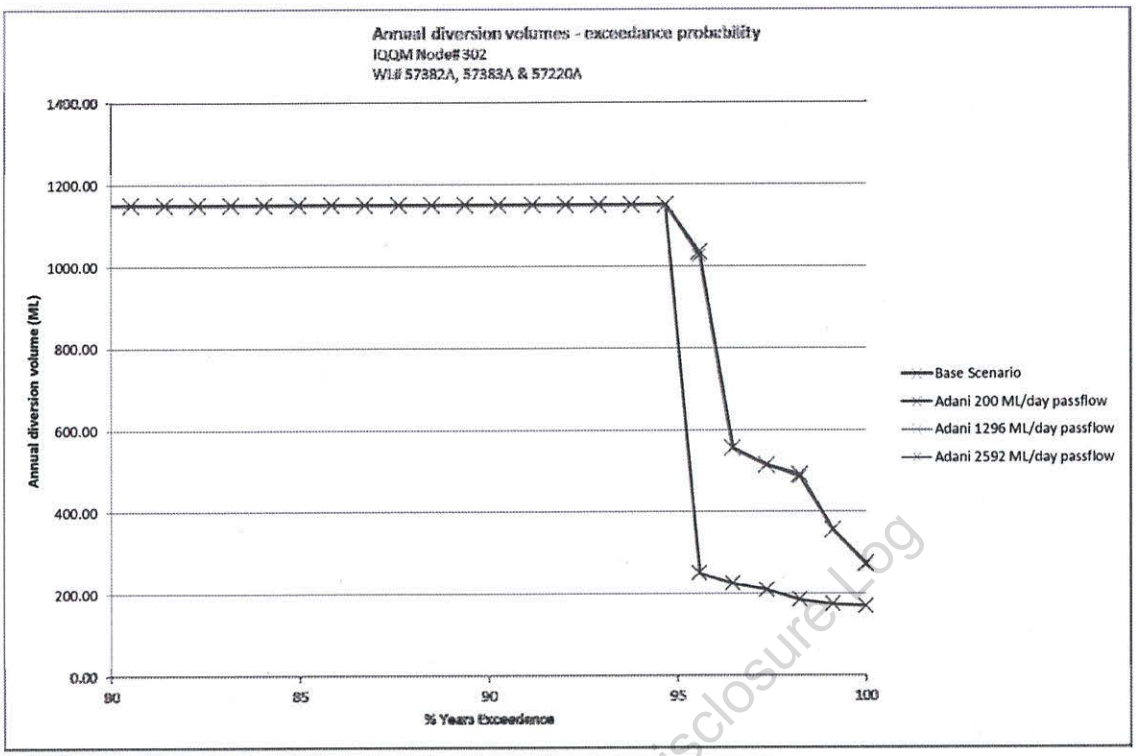
Figure 3 – Mean annual volume of diversion plots











Appendix 5 IQQM results – Annual number of days diversion opportunity

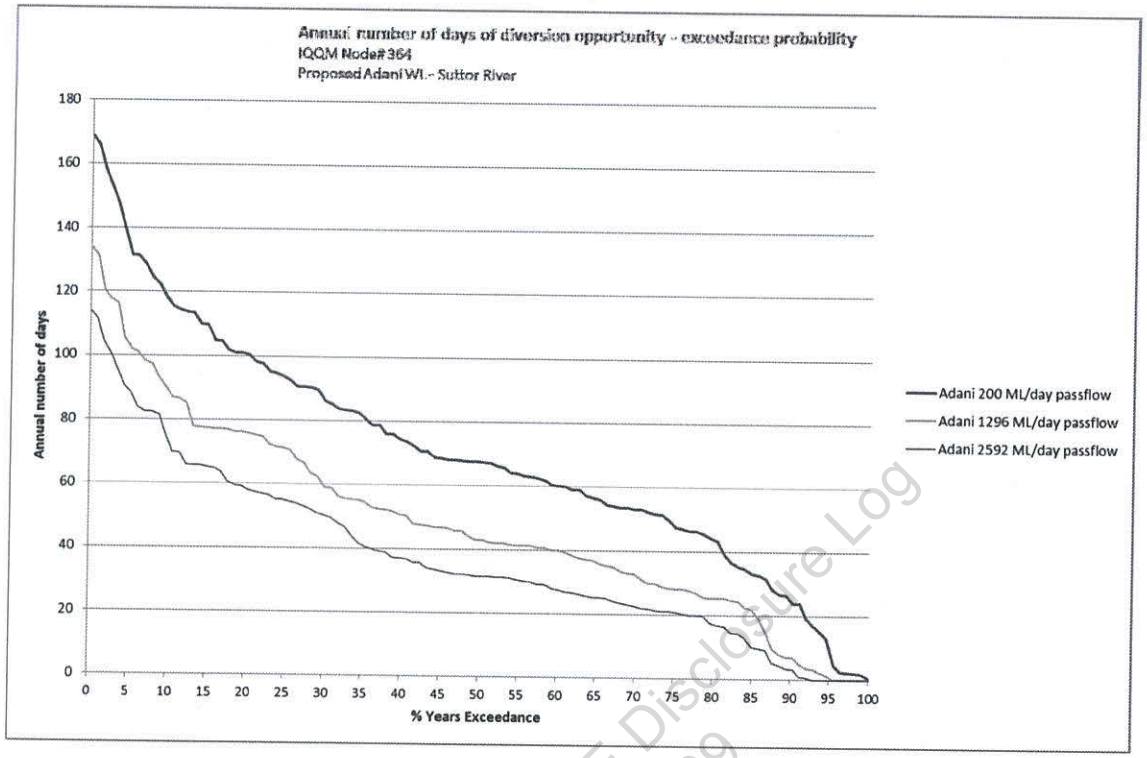
Table 11 - Hydrologic assessment results – mean annual days of diversion opportunity

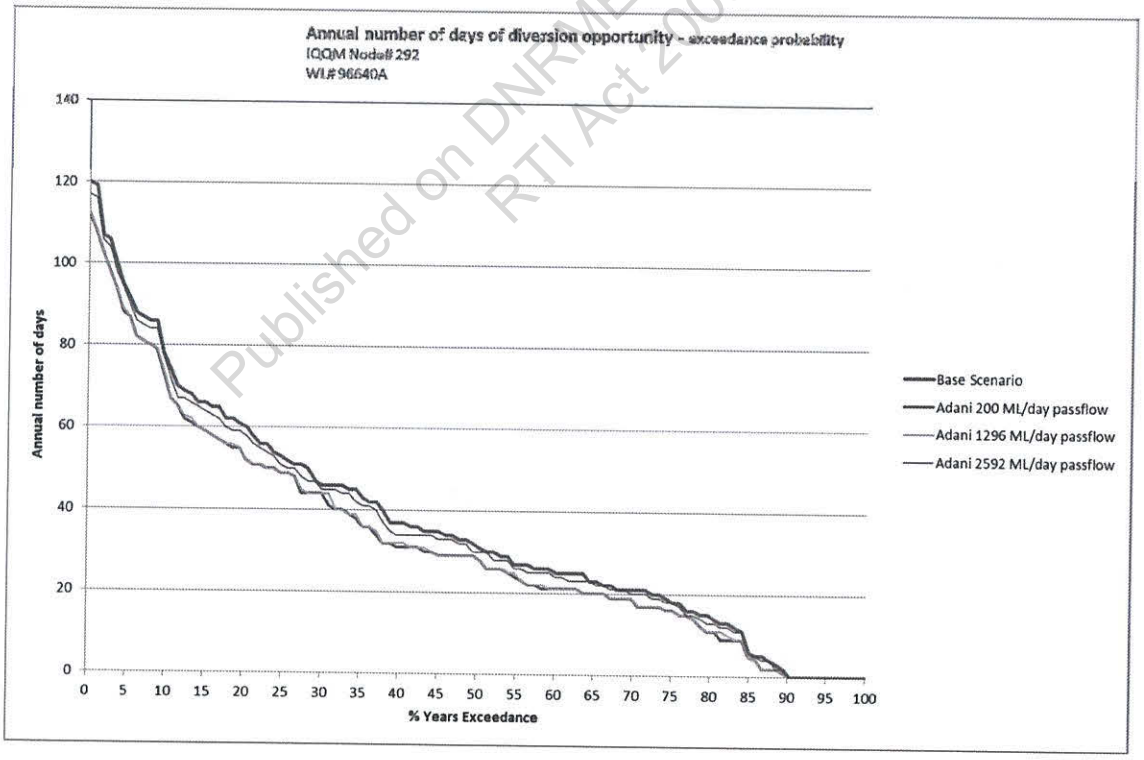
Water product details			Base scenario	200 ML/day passflow condition		1296 ML/day passflow condition		2592 ML/day passflow condition	
IQQM Node No.	Suttor River water licence	Nominal entitlement volume (ML/water year)	Number of day of diversion opportunity	Number of day of diversion opportunity	change from Base scenario	Number of day of diversion opportunity	change from Base scenario	Number of day of diversion opportunity	change from Base scenario
364	proposed diversion	12500	-	70		48		37	
291	55005A *Belyando anabranch*	560	25	25	*0*	25	*0*	25	*0*
292	96640A	5570	37	33	*-4*	33	*-4*	36	*-1*
293	52401A	2750	94	85	*-9*	94	*0*	94	*0*
300	52426A	3888	109	90	*-19*	109	*0*	109	*0*
302	57382A, 57383A & 57220A	1150	108	82	*-26*	108	*0*	108	*0*

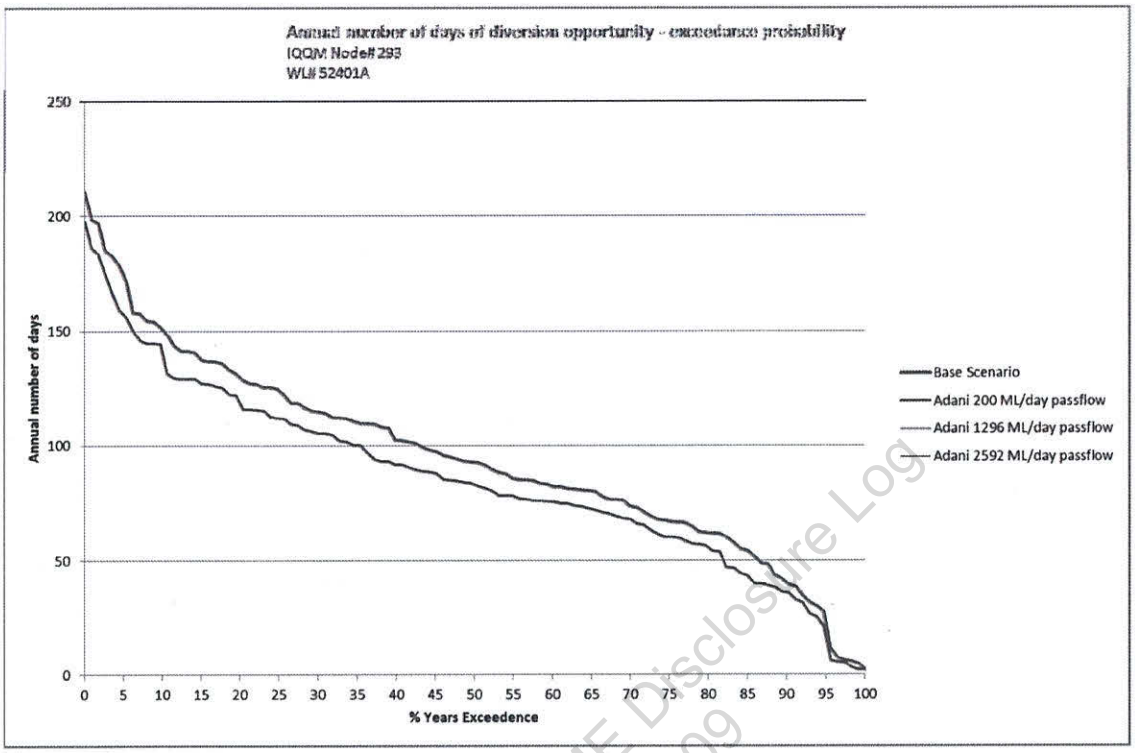
Table 12 - Hydrologic assessment results – 80th percentile annual days of diversion opportunity

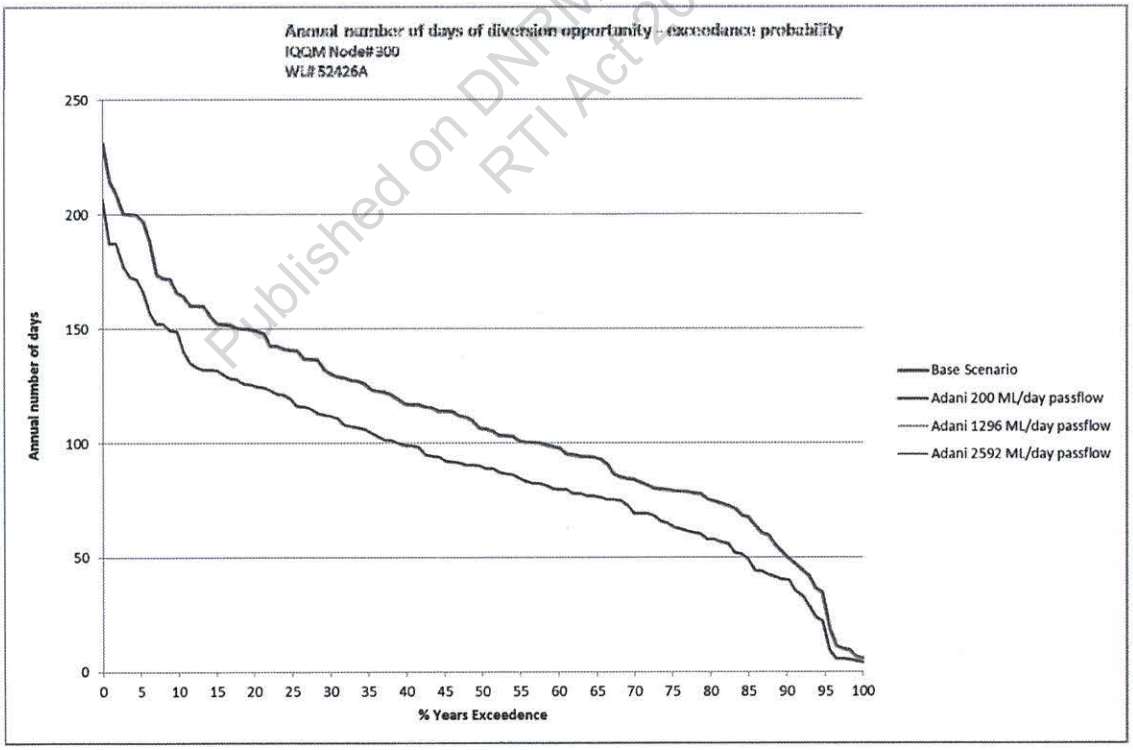
Water product details			Base scenario	200 ML/day passflow condition		1296 ML/day passflow condition		2592 ML/day passflow condition	
IQQM Node No.	Suttor River water licence	Nominal entitlement volume (ML/water year)	Mean annual volume (ML/water year)	Mean annual volume (ML/water year)	% difference from Base	Mean annual volume (ML/water year)	% difference from Base	Mean annual volume (ML/water year)	% difference from Base
364	proposed diversion	12500	-	43		25		16	
291	55005A *Belyando anabranch*	560	26	26	*0*	26	*0*	26	*0*
292	96640A	5570	14	11	*-3*	11	*-3*	13	*-1*
293	52401A	2750	61	54	*-7*	61	*0*	61	*0*
300	52426A	3888	74	57	*-17*	74	*0*	74	*0*
302	57382A, 57383A & 57220A	1150	73	52	*-21*	73	*0*	73	*0*

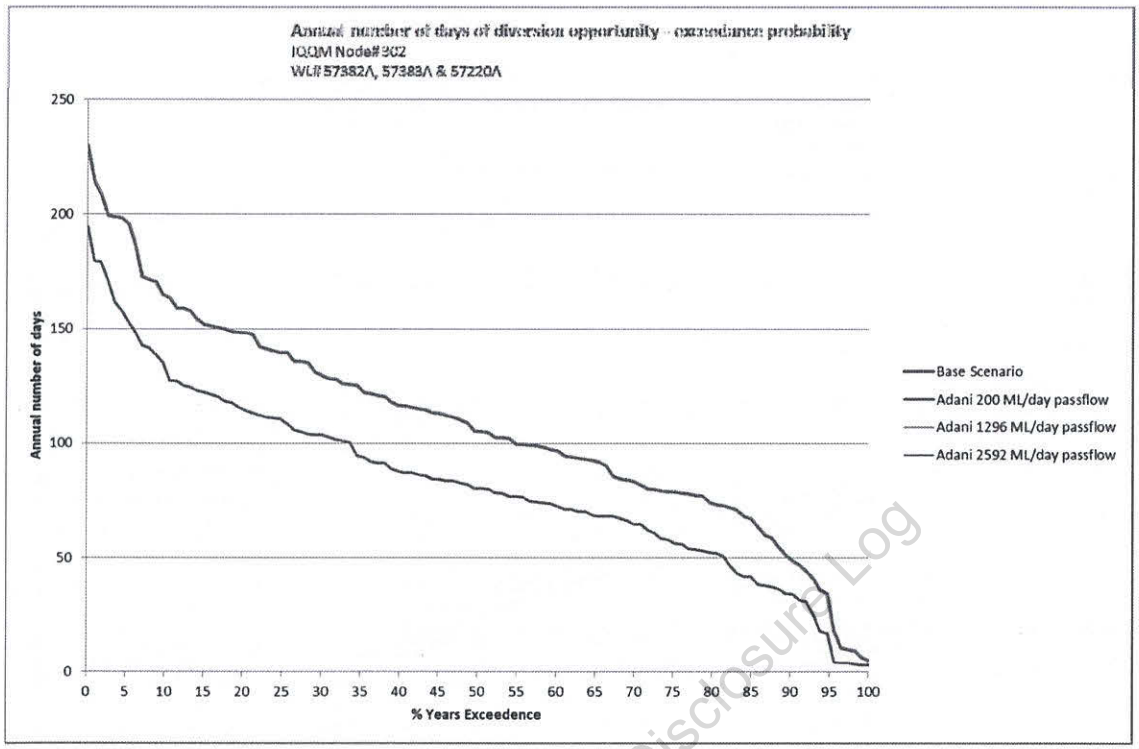
Figure 4 – Annual number of days of diversion plots











Att 10 – Submitters' responses

TUCKER Moira

From: s.49 - Confidential Communications
Sent: 18/02/2017 2:03 PM
To: BATTS Kathy
Cc: s.49 - Confidential Communications
Subject: Emailing: Adani Infrastructure water licence application 001, Adani Infrastructure water licence application 002
Attachments: Adani Infrastructure water licence application 001.jpg; Adani Infrastructure water licence application 002.jpg

Follow Up Flag: Follow up
Flag Status: Flagged

Kathy,

Please find attached my submission regarding the application by Adani Infrastructure Pty. Ltd. to take unallocated water from the Belyando Suttor River system.
Would you please attach it to the email I forwarded to you previously from the Minister for Agriculture Mr Joyce?

Kind regards

s.49 - Confidential Communications

Your message is ready to be sent with the following file or link attachments:

Adani Infrastructure water licence application 001 Adani Infrastructure water licence application 002

Note: To protect against computer viruses, e-mail programs may prevent sending or receiving certain types of file attachments. Check your e-mail security settings to determine how attachments are handled.

18.02.2017
The Department of Natural Resources and Mines
PO Box 1762
Rockhampton
QLD 4700

Ref. Proposal to offer strategic reserve unallocated surface water at a fixed price (Water Plan Burdekin Basin 2007)

Submission by s.49 - Confidential Communications regarding the above water licence application by Adani Infrastructure Pty. Ltd

Firstly, thank you for giving me the opportunity to make this submission.

s.49 - Confidential Communications

I am strongly opposed to Adani Infrastructure's application to take 10,800 megalitres of river water annually from our section of the Belyando-Suttor sub-catchment area E to be used in their mine works for the duration of the Carmichael Mine Project, which could be 90 years or 9 decades.

My reasons for objection are:

1/ **Streamflow volumes** have been dropping. The river water that is (currently) unallocated may well be needed in future decades to be allocated to maintain or create viable agriculture and cultivation downstream from the Belyando Crossing.

2/ **Unallocated Reserves**: Is it feasible to commit some of these precious unallocated reserves for 9 decades to a mining project?
Are there conditions proposed in the granting of this water licence for periodic reviews of the volume of water taken by Adani, and can a condition of granting this application be that this licence can be revoked by the DNRM or Department of Agriculture if there is a proven need for this water for agriculture downstream from the Belyando Crossing? I suggest that a condition is imposed that the review period be 5 yearly.
Equally, if Adani find water sources closer to their mine project can a condition be included they be forced to relinquish the Suttor River licence?
Can a condition also be included that will prevent them on-selling that water extracted from the Suttor River elsewhere?
Alternatively, by the DNRM granting this proposed water allocation, can Adani come back in a few years' time and ask for more unallocated reserves from our catchment? Can a condition of granting this allocation be that no further applications can be made by the same company for unallocated water from this Suttor River catchment?
I propose that the water allocation, if granted to Adani Infrastructure, is for a term no longer than 30 years.

3/ **Environmental concerns**: We live in the driest continent on earth, and it is getting drier. Is it responsible, environmentally and morally, for the State of Queensland to grant water rights to a foreign company which will use our water reserves to extract a mineral resource which will be exported solely for the purpose of creating cheaper electricity in another continent?

4/ Monitoring s.49 - Confidential Communications
s.49 - Confidential Communications

I object to the proposal by Adani Infrastructure that when water is taken from the Suttor River all they have to do is record the details and publish them. I suggest that a condition is imposed by the DNRM that any water extraction will also be monitored independently and remotely by the DNRM or other qualified government body, at the point of extraction in the Belyando River Anabranch,. I also request that a condition is made that the same water extraction data is available online for the public to view.
I suggest that a condition is imposed on the water licence that any mechanical monitoring equipment which is installed to check remotely on the rate of water extraction by Adani will be installed by an independent authority, such as the BOM, and its calibration and accuracy checked bi-annually by an independent body.

A further concern to me is the possibility of a malfunction in the monitoring equipment of the BOM station s.49 - Confidential Communications which shows the actual level of the streamflow and which level it is before water can be taken by Adani.
Several times the monitoring equipment has failed and false readings have been recorded. At one point there was no monitoring equipment working for 9 months. Each time there is a malfunction I have been able to alert the BOM that the recording equipment had failed, however if in future the BOM recording equipment shows the river streamflow as being at 2952 megalitres per day but in fact it is a lot lower due to equipment malfunction, then Adani Infrastructure who are upstream from the BOM station and cannot physically see the water level there, could be taking water when it is below the permitted level or not flowing at all over the crossing. This could be critical to my business.

5/ **Price of unallocated water**: will this fixed price sale process be selling the water to Adani Infrastucture for the same as the price water which is traded on the open market? Will the price be fixed annually or is it fixed for a term? As water becomes more precious its traded price is likely to increase and I suggest that one of the conditions imposed on Adani, if this water allocation is granted, is the ability by the DNRM to increase the water price and to conduct a regular reviews of that price maybe annually.

Yours faithfully,

s.49 - Confidential Communications

TUCKER Moira

From: s.49 - Confidential Communications
Sent: 17/02/2017 4:38 PM
To: BATTS Kathy
Subject:
Attachments: s.49 - Confidential Communications

Follow Up Flag: Follow up
Flag Status: Flagged

s.49 - Confidential Communications

Kathy

Thank you for your letter and opportunity to respond.

s.49 - Confidential Communications

1 830meg a day is a big % of a 2952ml flow.

2 How much water can s.49 - Confidential Communications pump on top of the 830meg per day?

Metering and Monitoring

A Where will this be published and who is the watch dog on these matters?

B Will there be ample insurances against fuel spills as to pump these large quantities of water large amounts of fuel would need to be stored?

C If the off stream storage was to bust are there insurances in place?

D I would be very concerned as to where excess water from this mine will be pumped to.

E Is there water entitlement left for an Australian farming family growing food for the world?

Have a plate of coal for breakfast

Yours Sincerely

s.49 - Confidential Communications

ATTACHMENT 10 – Analysis of submitters' responses to application by Adani Infrastructure

Name of Submitter	Issue/ impact on	Specific queries	Response	Outcome
s.49 - Confidential Communications	Streamflow volumes	Submitter states streamflow volume has been dropping and that current unallocated river water may be needed in future decades to maintain or create viable agriculture and cultivation downstream from the Belyando Crossing.	This issue has been dealt with as part of the assessment process against Criteria under s12 of the Water Plan (Burdekin basin) 2007 (Burdekin Basin WP). The general reserve specified under section 30 (1) of the Burdekin Basin WP is available as a possible water supply option for irrigation. It should be noted that in other release processes, the Department of Natural Resources and Mines (DNRM) has applied an agricultural strategy, where caps have been set on industrial access to the general reserve, to ensure water licence volume is available for agriculture. Adani Infrastructure Pty Ltd's (Adani Infrastructure's) proposal is for water licence volume from the strategic reserve.	This submission comment has been considered.

	Unallocated Reserves	Is it feasible to commit unallocated reserves for 9 decades?	The plan has already accounted for the potential future use of that water from Belyando Suttor Subcatchment E. Water plans are reviewed every 10 years. For water licences issued for projects of State significance from strategic reserve a nominal 99 year expiry date applies. However, the proposed water licence to be granted to Adani Infrastructure is conditioned to expire at the conclusion of the Carmichael Coal Mine and Rail Project	This submission comment has been considered.
		Are there conditions proposed in the granting of the WL for periodic reviews of the volume of water taken? (suggest that a condition is imposed that the review period be 5 yearly).	Water licence conditions do not provide for periodic review of the nominal entitlement volume of the water licence. The water licence will support both the construction and operational phases of the mine and as such, Adani Infrastructure's water requirements are likely to be variable. Also, the availability to take water from the Suttor River will	This submission comment has been considered.

			be dependent on sufficient/minimal streamflow thresholds which will limit diversion in some years.	
		Can a condition of granting this WL be that the WL can be revoked by DNRM if there is a proven need for this water for agriculture downstream from the Belyando Crossing?	The general reserve specified under section 30 (1) of the Burdekin Basin WP is available as a possible water supply option for agricultural developments. Water Plan reviews are undertaken every 10 years to assess whether specific outcomes of the plans are met and recognise new identified risks to the resource. This process provides for review of unallocated water volumes. The current plan provides for an agricultural strategy, where appropriate limits have been set on industrial access to the general reserve, to ensure water is available for agriculture.	This submission comment has been considered.

		If Adani find water sources closer to the mine area can a condition be included they be forced to relinquish the Suttor River licence?	Alternative water supply options have been included in the assessment of the Adani water licence application under s32 of the Burdekin Basin WP. The applicant has undertaken analysis of various water supply options, however water from the Suttor River was considered the most economic and flexible in relation to their operations.	This submission comment has been considered.
		Will a condition be included that will prevent Adani from on-selling water extracted from the Suttor River elsewhere?	A water licence granted will be for the purpose of the Carmichael Coal Mine and Rail Project. On-selling of water was not included as an activity of the project purposes.	This submission comment has been considered
		By DNRM granting this water allocation, can Adani come back in a few years' time and request more unallocated reserves from the catchment?	Yes. Like any other State significant project, if there is volume available in the strategic reserve outlined in the Burdekin Basin WP, Adani Infrastructure or another proponent has the ability to access water through another water release process and subject to conditions of that release.	This submission comment has been considered

ATTACHMENT 10 – Analysis of submitters' responses to application by Adani Infrastructure

		Can a condition granting this allocation be that no further applications be made by the same company for unallocated water from the Suttor River catchment?	No. Like any other State significant project, if there is volume available in the strategic reserve outlined in the Burdekin Basin WP, Adani Infrastructure or another proponent has the ability to access water through another water release process and subject to conditions of that release.	This submission comment has been considered
	Environmental Concerns	Is it environmentally and morally responsible for the State of Queensland to grant water rights to a foreign company which will use our water reserves to extract a mineral resource which will be exported solely for the purpose of creating cheaper electricity in another continent?		Not considered. This issue is outside of the scope of DNRM's assessment under the *Water Act 2000* (Water Act).
	Monitoring & Metering	The existing BOM station at St Anns monitors water level and stream flow on an hourly basis and data can be read remotely by the public. I object to Adani only needing to record the details when water is taken by them and publish the data. I suggest a condition imposed by DNRM that water extraction is	The proposed water licence will include monitoring and reporting conditions for; 1. extraction from the Suttor River to the Belyando River Anabranch; and 2. the relift from the Belyando River Anabranch.	This submission comment has been considered.

		monitored independently and remotely by DNRM or other government body at the point of extraction in the Belyando River Anabranch. I also suggest that water extraction is available online for the public to view.	Total daily diversion volume will be published on a daily basis. Other extraction data such as time of take, changes in instantaneous rate of take and volume will be published on a monthly basis. Installed monitoring equipment must be authorised by an approved independent meter validator. DNRM has the ability to conduct compliance checks on the installed diversion works and meter devices at any time.	
		Would like a condition on the WL that any mechanical monitoring equipment which is installed to check remotely on the rate of water extraction by Adani be installed by an independent authority, such as BOM and its calibration and accuracy checked bi-annually by an independent body.	The proposed authorisation will include a condition requiring the meter to be installed by an authorised meter validator.	This submission comment has been considered.

	Price of unallocated water	Will this fixed price sale process be selling the water to Adani for the same as the price which is traded on the open market?	The price of water for this release has been determined by DNRM to be consistent with current market value.	This submission comment has been considered.
		Will the price be fixed annually or is it fixed for a term?	This Strategic Reserve water release is a fixed price process. The reserve volume is released on the one off payment for the total amount of water granted prior to the take of that water. The Terms of Sale require an 8% deposit prior to grant and payment of balance by 1 July 2018. The licence will expire if there is non-compliance with licence conditions.	This submission comment has been considered.
		As water becomes more precious, its traded price is likely to increase and suggest that a condition be imposed on Adani that if the water allocation is granted, DNRM can increase that water price and to conduct annual reviews of that price.	This Strategic Reserve water release is a fixed price process. The reserve volume is release on the one off payment for the total amount of water granted prior to the take of that water. The Terms of Sale require an 8% deposit prior to grant and	This submission comment has been considered.

			payment of balance by 1 July 2018. The licence will expire if there is non-compliance with licence conditions. The Terms of Sale do not include ability to continue charging for the water licence or the volume of water taken following the original issue of the water licence.	
s.49 - Confidential Communications	Streamflow volumes	Adani Infrastructure has applied for 10 times the water allocation we applied for, 830 megalitres per day is a big percentage of a 2952 megalitre flow. *Note – the submission stated 2952 ML flow due to error on the submission correspondence and it is understood to mean 2592.	s.49 - Confidential Communications Using the hydrological assessment tool IQQM (integrated quantity	This submission comment has been considered.

			quality model), the diversion rate at the 2592 ML/day flow condition was assessed to be consistent with the Burdekin Basin WP objectives and outcomes.	
		How much water can s.49 - Confidential Communications pump on top of the 830 megalitres per day?	The assessment of the application includes modelling of all entitlements on the Suttor River at full utilisation. s.49 - Confidential Communications will still have ability to take their entitlement. The daily volumetric limit of 830 ML/day is for the Adani water licence. All other water licences to take water from the Suttor River will be able to do so.	This submission comment has been considered

	Unallocated reserves	Are there any water entitlements left for the area?	The general reserve specified under section 30 (1) of the Burdekin Basin WP is available as a possible water supply option for irrigation. The general reserve is available as a possible water supply option for irrigators. It should be noted that in other release processes, DNRM has applied an agricultural strategy where volume limits have been set on access to the general reserve for activities other than agriculture.	This submission comment has been considered.
	Monitoring and metering	Where will this data be published and who is the watch dog on these matters?	Reporting of monitored data will require it to be Published on the applicant's website. The Chief Executive	This submission comment has been considered

			administering the Water Act will be responsible for ensuring compliance with the conditions of the licence.	
	Environmental Concerns	Will there be ample insurance against fuel spills as to pump these large quantities of water? Won't large amounts of fuel need to be stored?	Regulation of storage of fuels and chemicals and dealing with related environmental contamination offences are administered under the Environmental and Protection Act 1994 Adani Infrastructure's supporting information proposes that any potential impacts from chemical spills are likely to be localised and temporary in nature and a Construction Environmental Management Plan, will be prepared and implemented for the construction phase to minimise impacts arising from construction activities.	This issue is outside of the scope of DNRM's assessment under the Water Act

		If the off stream storage was to bust are there insurances in place?	Construction of the off stream storage required Local Authority approval and may require State Government development approval under the Water Supply (Safety and Reliability) Act 2008 administered by the Department of Water Energy and Safety (DEWS).	This issue is outside of the scope of DNRM's assessment under the Water Act 2000
		Where will the excess water from the mine be pumped to?	The Environmental Authority granted by the Department of Environment and Heritage Protection provides conditions relating to the release of mine site water to the Carmichael River.	This issue is outside of the scope of DNRM's assessment under the Water Act 2000

DRAFT water licence

WATER LICENCE

Water Act 2000 (Qld)

Reference	******	**Expiry Date**	30/06/2077
Licensee	ADANI INFRASTRUCTURE PTY LTD ACN 606 764 827		
Authorised Activity	The taking of watercourse water from the Suttor River with the point of take on or adjacent to Lot 3 on SP278559 Water will be taken from the Suttor River and transferred to an off-stream storage via the Belyando River Anabranch.		
Authorised Purpose	Water supply for the Carmichael Coal Mine and Rail Project		
Nominal Entitlement	12,500 megalitres		
Rate of Take	11,600 litres per second		

This licence is also subject to the attached conditions (Conditions).

Under the *Sustainable Planning Act 2009* (Qld) a development permit may be required for operational works to take or interfere with the water described in this licence. The Licensee must ensure that the relevant development approvals have been obtained prior to installing or constructing new or additional operational works.

Given at Rockhampton this XX day of MM YYYY.

[signature]

Name

Position

Delegate of the Chief Executive

Department of Natural Resources and Mines

ATTACHMENT 11

*Water Licence Conditions: ******

Expiry Date: 30/06/2077

Interpretation

1. In this licence:
   a. a reference to a Condition shall be a reference to a Condition of this licence;
   b. headings to Conditions are for ease of reference only and shall not in any way affect the meaning of the Conditions;
   c. a reference to days or months is a reference to calendar days or calendar months;
   d. a reference to the conclusion of the Carmichael Coal Mine and Rail Project is a reference to the surrender or cancellation of Mining Lease 70441, Mining Lease 70505 and Mining Lease 70506;
   e. a reference to the Chief Executive includes the Chief Executive's successor;
   f. a reference to a document (including this licence) is to that document as varied, or replaced from time to time;
   g. a reference to a statute includes its delegated legislation and a reference to a statute or delegated legislation or a provision of either includes consolidations, amendments, re-enactments and replacements;
   h. a reference to a schedule, attachment or annexure is a reference to a schedule, attachment or annexure to or of this licence, and a reference to this licence includes all schedules, attachments and annexures to it;
   i. a word importing the singular includes the plural (and vice versa), and a word indicating a gender includes every other gender;
   j. if a word or phrase is given a defined meaning, any other part of speech or grammatical form of that word or phrase has a corresponding meaning;
   k. 'includes' in any form is not a word of limitation; and
   l. a reference to $ or dollar is to Australian currency.

Definitions

2. Terms not otherwise defined in this licence have the same meaning as in the Act, except where a contrary intention appears:

"***Act***" means the *Water Act 2000* (Qld).
"***Appropriately qualified person***" means a person who has professional qualifications, training, skills, or experience related to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relative to the subject matter using the relative protocols, standards, methods or literature.
"***Authorised Activity***" has the meaning set out on the first page of this licence.
"***Authorised Meter Validator***" is a person appointed by the Chief Executive as an authorised meter validator under section 109 of the *Water Regulation 2016*.
"***Authorised Purpose***" has the meaning set out on the first page of this licence.
"***Balance of Total Purchase Price***" means that sum of $18,540,576.00 being the Total Purchase Price less the Deposit.
"***Business Day***" means a day on which trading banks are open for normal banking business in Brisbane.
"***Carmichael Coal Mine and Rail Project***" means the Carmichael Coal Mine and Rail Project which was declared a coordinated project under the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWOA) on 26 November 2010 and declared on 7 October 2016 as a prescribed project and a critical infrastructure project pursuant to section 76E(1) of the SDPWOA.
"***Chief Executive***" means the Chief Executive administering chapter 2 of the Act and his or her authorised delegate.
"***Deposit***" means the non-refundable deposit of $1,612,224.00.
"***Due Date***" means 1 July 2018.

"***Expiry Date***" means 30 June 2077.
"***Licensee***" means the Licensee set out on the first page of this licence.
"***Mean Annual Volume***" means the long-term average annual volume share of the resource availability as determined by the Chief Executive from the parameters of this licence.
"***Monitoring and Evaluation Program***" means the program as described in Condition 21 of this licence.
"***Publish***", for the purposes of this licence, has the meaning set out section 1009A (2) (b) of the Act.
"***Nominal Entitlement***" means the maximum volumetric limit or volume in megalitres that can be taken under this licence during a water year.
"***Relift***" is where a volume of water is released into a watercourse, and then an equivalent volume is taken from that watercourse.
"***Rate of Take***" is a volume measured in litres per second.
"***State***" means the State of Queensland.
"***Strategic Reserve***" means unallocated water reserved as strategic reserve as provided for in the *Water Plan (Burdekin Basin) 2007* (Qld).
"***Total Purchase Price"*** means the sum of $20,152,800.00.

Payment

3. The Chief Executive acknowledges receipt of the Deposit from the Licensee.

4. Water **must not** to be taken under the authority of this licence until the Licensee has paid the Balance of the Total Purchase Price by the Due Date.

5. Upon failure of the Licensee to pay the Balance of the Total Purchase Price by the Due Date, the Chief Executive may commence a show cause process under sections 132(1)(c) and 135 of the Act to determine whether the licence should be cancelled.

Entitlement

6. The Authorised Activity is permitted only for the Authorised Purpose.

7. The Mean Annual Volume assigned from the Strategic Reserve for this licence is 10,800 megalitres.

8. The taking of water under this licence is permitted only when the flow of water, as determined by the State's Gauging Station Suttor River at St Anns (gauging station no. 120303A), exceeds 2,592 megalitres per day.

9. The daily volumetric limit that may be taken under this licence is 830 megalitres.

10. This licence expires on the earlier of:
    a. the Expiry Date; or
    b. the conclusion of the Carmichael Coal Mine and Rail Project,

    whereupon the volume of water returns to the Strategic Reserve as unallocated water to be released for State purposes in accordance with section 33B of the *Water Plan (Burdekin Basin) 2007*.

Metering

11. The Authorised Activity must not be undertaken under this licence unless a measuring device (which may include a telemetric meter), of a type approved by the Chief Executive (to measure the volume of water taken and released), is installed for:
    a. water taken from the Suttor River;
    b. water released into the Belyando River Anabranch; and

c. water taken from the Belyando River Anabranch.

12. Meters installed under Condition 11 must be validated by an Authorised Meter Validator.

Recording and Reporting

13. The total volume taken during the previous day must be Published by the end of the following day.

14. On each occasion that water is taken from the Suttor River under this licence, the Licensee must record:
    a. the date and the time at the start and end of the period of take;
    b. the meter reading at the start and end of the period;
    c. the daily volume taken;
    d. the Rate of Take, and for each change in the Rate of Take:
        i. the date and time of the change; and
        ii. the new Rate of Take.

15. Such records under Condition 14 must be Published within 5 Business Days of the end of each month by the Licensee and made available to the Chief Executive upon request (and within 5 Business Days of such request).

16. On each occasion that water is released into the Belyando River Anabranch for the purpose of Relifting the water under this licence, the Licensee must record:
    a. the date and the time at the start and end of the release period;
    b. the meter reading at the start and end of the period;
    c. the daily volume released;
    d. the release rate, and for each change in the release rate:
        i. the date and time of the change; and
        ii. the new release rate.

17. Such records under Condition 16 must be Published within 5 Business Days of the end of each month by the Licensee and made available to the Chief Executive upon request (and within 5 Business Days of such request).

18. On each occasion that water is taken from the Belyando River Anabranch under this licence, the Licensee must record:
    a. the date and the time at the start and end of the period of take;
    b. the meter reading at the start and end of the period;
    c. the daily volume taken;
    d. the Rate of Take, and for each change in the Rate of Take:
        i. the date and time of the change; and
        ii. the new Rate of Take.

19. Such records under Condition 18 must be Published within 5 Business Days of the end of each month by the Licensee and made available to the Chief Executive upon request (and within 5 Business Days of such request).

Relift requirements

20. Water taken daily from the Belyando River Anabranch under this licence:
    a. may only be taken after water taken from the Suttor River is released or is being released into the Belyando River Anabranch by the Licensee; and
    b. must not exceed the daily volume released into the Belyando River Anabranch.

21. Operations to release water into the Belyando River Anabranch under this licence must take into account impacts on watercourse bed and bank stability and riparian vegetation by having an appropriately qualified person develop, implement and maintain a Monitoring and Evaluation Program that includes a monitoring and maintenance strategy which identifies maintenance actions and details remedial works to be undertaken (including a timetable for completion of proposed works) to address impacts on the physical integrity of the watercourse and riparian vegetation.

22. A report of the outcomes from the Monitoring and Evaluation Program (as required under Condition 21) must be prepared by an appropriately qualified person and an electronic copy of the report must be provided to the Chief Executive upon request and within requested timeframes.

23. The Licensee must carry out any activities or make any alteration deemed necessary by the Chief Executive for the protection and maintenance of the physical integrity of the watercourse and the riparian environment.

OFFER OF A WATER LICENCE

TO: **The State of Queensland represented by the Chief Executive, Department of Natural Resources and Mines (the Department)**,
[Level 1, 209 Bolsover Street, PO Box 1762, Rockhampton, Queensland 4700]

RE: Granting a water licence from the strategic reserve of unallocated water in the Belyando-Suttor Subcatchment Area E of the *Water Plan (Burdekin Basin) 2007*.

I/We: Adani Infrastructure Pty Ltd

Of: Level 25, 10 Eagle Street, Brisbane, Queensland 4001

Acknowledge receipt of the offer for a water licence from the Department, and with regard to the proposed water licence (mark one box):

☐ Accept the offer and will make a deposit of $1,612,224 by **23 March 2017** and make full payment of the balance of $18,540,576 by **1 July 2018**.

☐ Decline the offer.

All parties are to complete and sign below. All signatures must be witnessed.
If more space is required, copy or print a blank copy of this page, complete and attach.

Please send the completed form via registered post to:
Private and confidential: strategic reserve unallocated water (Burdekin Basin)
Chief Executive
Attention: Darren Moor, Executive Director
Department of Natural Resources and Mines
PO Box 1762
Rockhampton QLD 4700

DATED at this day of 2017

Executed by Adani Infrastructure Pty Ltd ACN 606 764 827 in accordance with section 127 of the *Corporations Act 2001*:)

.....	.....
Company Secretary/Director	Director
.....	.....
Name of Company Secretary/Director (print)	Name of Director (print)

ATTACHMENT 101 **DOCUMENTED DECISION FOR DEALINGS UNDER THE *WATER ACT 2000* AND *SUSTAINABLE PLANNING ACT 2009***

PROPOSED DEALING AREA/S

Unallocated water released under the Water Plan (Burdekin Basin) 2007
Land\Watercourse Description: Adjacent to Lot 3 on SP278559 – Suttor River & Belyando River Anabranch
Local Authority: Llanarth **Current Tenure/s:** USL – boundary watercourse

PROPOSED DEALING/S: New Water Licence

Dealing under section 116 of the *Water Act 2000* for the grant of a water licence for unallocated surface water from the strategic reserve in the Belyando-Suttor subcatchment area E of the Water Plan (Burdekin Basin) 2007. The application is to Take Water from the Suttor River and Belyando River Anabranch adjacent to Lot 3 on SP278559 with a mean annual volume of 10,800 Megalitres.

DECISION (Please select one option)

☐ Proceed without notification ☑Notify and consider comments

☐ Refer to AAT

REASON FOR DECISION (Please select one option)

NOTIFICATION

☑ Proposed dealing requires notification - Module H

WATER PROCEDURE ASSESSMENT

☐ Dealing may proceed without further reference to native title - Water Mod AB

☐ Proposed dealing area is covered by an ILUA, refer dealing to AAT - Water Mod AC

☐ Proposed dealing area covered by native title determination (native title does not exist) - Water Mod AD

☐ Proposed dealing to proceed due to previous extinguishing grant - Water Mod BA

☐ Proposed dealing to proceed due to previous public works - Water Mod CA

☐ Proposed dealing to proceed due to valid dedicated road - Water Mod CB

☐ Proposed dealing relates to a primary production activity on a non-exclusive pastoral/agricultural lease – Module GB

☐ Proposed dealing to proceed as a renewal/amendment action - Module IC

NB: Attach relevant evidence for assessments recorded under Modules BA, CA, CB, GB & IC.

Name of Decision Maker: Kathy Batts

Position: A/Manager Major Projects

Signature: s.49 - Signature **Date**: 13/01/2017

Notification Form A

Notification under the Commonwealth *Native Title Act 1993*

To: BALGANUNNA ABORIGINAL CORPORATION RNTBC, TRUSTEE BODY CORPORATE, C/- DILLON BOWERS LAWYER, PO BOX 626, TOWNSVILLE QLD 4810

To: NORTH QUEENSLAND LAND COUNCIL NATIVE TITLE REPRESENTATIVE BODY ABORIGINAL CORPORATION, PO BOX 679N, CAIRNS, QLD, 4870

To: QUEENSLAND SOUTH NATIVE TITLE SERVICES LTD, PO BOX 10832 ADELAIDE ST, LEVEL 10, 370 QUEEN STREET, BRISBANE, QLD, 4000

Date of Issue: 16 January 2017

SECTION OF NTA	s24HA

DEPARTMENT/AGENCY	Department of Natural Resources and Mines

CONTACT NAME	Kathy Batts
E-MAIL	centralwaterservices@dnrm.qld.gov.au
TELEPHONE NO. **FAX NO.**	1800 822 100 4999 6904
REFERENCE NO.	Application for strategic reserve unallocated surface water available at a fixed price (Water Plan (Burdekin Basin) 2007)

An application has been received by Department of Natural Resources And Mines for the following approval:

TYPE OF APPROVAL/S	Application is to purchase unallocated surface water from the strategic reserve of the Water Plan (Burdekin Basin) 2007. If the application is successful it will result in a water licence being issued for the period of the project.
UNDER WHAT STATE ACT	*Water Act 2000*

The approval, if granted, will permit the following activity to happen:

NATURE OF ACTIVITY	The application is to Take Water from the Suttor River and Belyando River Anabranch adjacent to Lot 3 on SP278559 with a mean annual volume of 10,800 Megalitres. The application for the water licence must be consistent with the provisions of the *Water Act 2000*, the Water Plan (Burdekin Basin) 2007 and the Terms of Sale approved under the Water Regulation 2016. Applications are assessed in accordance with the provisions of the *Water Act 2000*, Water Regulation 2016 and Water Plan (Burdekin Basin) 2007 and the Burdekin Water Management Protocol. A decision on the application can include granting with conditions, or refusing to grant. If the decision on the application subject to this notification is to grant with conditions, a letter of offer including a draft water licence with conditions will be issued.

The above activity will be located within:

LOCATION OF ACTIVITY	Adjacent to Lot 3 on SP278559 located at LLanarth,
MAPS/PLANS	Attached are maps of the locality.
NAME OF REGISTERED NATIVE TITLE CLAIMANT GROUP/S OR NAME OF REGISTERED NATIVE TITLE BODY CORPORATE	Nil
NAME OF NATIVE TITLE REPRESENTATIVE BODY	Bulganunna Aboriginal Corporation RNTBC North Queensland Land Council Native Title Representative Body Aboriginal corporation Queensland South Native Title Services Ltd

The activity, if approved, will commence only after notification and consideration of all comments. In addition, if approved, the activity will be approved for the following period of time:

DURATION OF APPROVAL	Water licence will be issued for the term of the project.

You are invited to comment upon the proposed future act outlined above.

Any comments must be **IN WRITING** and must be received no later than 17 February 2017.

Please send your comments via post to:
Kathy Batts
A/Manager Major Projects
Water Services
Department of Natural Resources and Mines
PO Box 1762
ROCKHAMPTON QLD 4700

Or via email to:
centralwaterservices@dnrm.qld.gov.au
(attention to Kathy Batts)

Notification Form A

Notification under the Commonwealth *Native Title Act 1993*

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To: NORTH QUEENSLAND LAND COUNCIL NATIVE TITLE REPRESENTATIVE BODY ABORIGINAL CORPORATION, PO BOX 679N, CAIRNS, QLD, 4870

To: QUEENSLAND SOUTH NATIVE TITLE SERVICES LTD, PO BOX 10832 ADELAIDE ST, LEVEL 10, 370 QUEEN STREET, BRISBANE, QLD, 4000

Date of Issue: 16 January 2017

SECTION OF NTA	s24HA

DEPARTMENT/AGENCY	Department of Natural Resources and Mines

CONTACT NAME	Kathy Batts
E-MAIL	centralwaterservices@dnrm.qld.gov.au
TELEPHONE NO. **FAX NO.**	1800 822 100 4999 6904
REFERENCE NO.	Application for strategic reserve unallocated surface water available at a fixed price (Water Plan (Burdekin Basin) 2007)

An application has been received by Department of Natural Resources And Mines for the following approval:

TYPE OF APPROVAL/S	Application is to purchase unallocated surface water from the strategic reserve of the Water Plan (Burdekin Basin) 2007. If the application is successful it will result in a water licence being issued for the period of the project.
UNDER WHAT STATE ACT	*Water Act 2000*

The approval, if granted, will permit the following activity to happen:

NATURE OF ACTIVITY	The application is to Take Water from the Suttor River and Belyando River Anabranch adjacent to Lot 3 on SP278559 with a mean annual volume of 10,800 Megalitres. The application for the water licence must be consistent with the provisions of the *Water Act 2000*, the Water Plan (Burdekin Basin) 2007 and the Terms of Sale approved under the Water Regulation 2016. Applications are assessed in accordance with the provisions of the *Water Act 2000*, Water Regulation 2016 and Water Plan (Burdekin Basin) 2007 and the Burdekin Water Management Protocol. A decision on the application can include granting with conditions, or refusing to grant. If the decision on the application subject to this notification is to grant with conditions, a letter of offer including a draft water licence with conditions will be issued.

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The activity, if approved, will commence only after notification and consideration of all comments. In addition, if approved, the activity will be approved for the following period of time:

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You are invited to comment upon the proposed future act outlined above.

Any comments must be **IN WRITING** and must be received no later than 17 February 2017.

Please send your comments via post to:
Kathy Batts
A/Manager Major Projects
Water Services
Department of Natural Resources and Mines
PO Box 1762
ROCKHAMPTON QLD 4700

Or via email to:
centralwaterservices@dnrm.qld.gov.au
(attention to Kathy Batts)

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Notification under the Commonwealth *Native Title Act 1993*

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Date of Issue: 16 January 2017

SECTION OF NTA	s24HA

DEPARTMENT/AGENCY	Department of Natural Resources and Mines

CONTACT NAME	Kathy Batts
E-MAIL	centralwaterservices@dnrm.qld.gov.au
TELEPHONE NO. **FAX NO.**	1800 822 100 4999 6904
REFERENCE NO.	Application for strategic reserve unallocated surface water available at a fixed price (Water Plan (Burdekin Basin) 2007)

An application has been received by Department of Natural Resources And Mines for the following approval:

TYPE OF APPROVAL/S	Application is to purchase unallocated surface water from the strategic reserve of the Water Plan (Burdekin Basin) 2007. If the application is successful it will result in a water licence being issued for the period of the project.
UNDER WHAT STATE ACT	*Water Act 2000*

The approval, if granted, will permit the following activity to happen:

NATURE OF ACTIVITY	The application is to Take Water from the Suttor River and Belyando River Anabranch adjacent to Lot 3 on SP278559 with a mean annual volume of 10,800 Megalitres. The application for the water licence must be consistent with the provisions of the *Water Act 2000*, the Water Plan (Burdekin Basin) 2007 and the Terms of Sale approved under the Water Regulation 2016. Applications are assessed in accordance with the provisions of the *Water Act 2000*, Water Regulation 2016 and Water Plan (Burdekin Basin) 2007 and the Burdekin Water Management Protocol. A decision on the application can include granting with conditions, or refusing to grant. If the decision on the application subject to this notification is to grant with conditions, a letter of offer including a draft water licence with conditions will be issued.

The above activity will be located within:

LOCATION OF ACTIVITY	Adjacent to Lot 3 on SP278559 located at LLanarth,
MAPS/PLANS	Attached are maps of the locality.
NAME OF REGISTERED NATIVE TITLE CLAIMANT GROUP/S OR NAME OF REGISTERED NATIVE TITLE BODY CORPORATE	Nil
NAME OF NATIVE TITLE REPRESENTATIVE BODY	Bulganunna Aboriginal Corporation RNTBC North Queensland Land Council Native Title Representative Body Aboriginal corporation Queensland South Native Title Services Ltd

The activity, if approved, will commence only after notification and consideration of all comments. In addition, if approved, the activity will be approved for the following period of time:

DURATION OF APPROVAL	Water licence will be issued for the term of the project.

You are invited to comment upon the proposed future act outlined above.

Any comments must be **IN WRITING** and must be received no later than 17 February 2017.

Please send your comments via post to:
Kathy Batts
A/Manager Major Projects
Water Services
Department of Natural Resources and Mines
PO Box 1762
ROCKHAMPTON QLD 4700

Or via email to:
centralwaterservices@dnrm.qld.gov.au
(attention to Kathy Batts)

OFFER OF A WATER LICENCE

TO: **The State of Queensland represented by the Chief Executive, Department of Natural Resources and Mines (the Department)**, [Level 1, 209 Bolsover Street, PO Box 1762, Rockhampton, Queensland 4700]

RE: Granting a water licence from the strategic reserve of unallocated water in the Belyando-Suttor Subcatchment Area E of the *Water Plan (Burdekin Basin) 2007*.

I/We: Adani Infrastructure Pty Ltd

Of: Level 25, 10 Eagle Street, Brisbane, Queensland 4001

Acknowledge receipt of the offer for a water licence from the Department, and with regard to the proposed water licence (mark one box):

☐ Accept the offer and will make a deposit of $1,612,224 by **23 March 2017** and make full payment of the balance of $18,540,576 by **1 July 2018**.

☐ Decline the offer.

All parties are to complete and sign below. All signatures must be witnessed.
If more space is required, copy or print a blank copy of this page, complete and attach.

Please send the completed form via registered post to:
Private and confidential: strategic reserve unallocated water (Burdekin Basin)
Chief Executive
Attention: Darren Moor, Executive Director
Department of Natural Resources and Mines
PO Box 1762
Rockhampton QLD 4700

DATED at this day of 2017

Executed by Adani Infrastructure Pty Ltd ACN 606 764 827 in accordance with section 127 of the *Corporations Act 2001*:)

.....	.....
Company Secretary/Director	Director
.....	.....
Name of Company Secretary/Director (print)	Name of Director (print)